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OFFICIAL GAZETTE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 24, 1996 Volume 1193 Number 4

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 21, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,271,099 through 5,272,769
Reissue Patents based on the above identified patents.

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Attention is drawn to the patents which were issued on December 19, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,887,315 through 4,888,824
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 17, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,558,466 through 4,559,645
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED October 16, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,608	06/913,719	02/23/88
(4,477,035)	(06/462,558)	(10/16/84)
Re. 32,630	06/727,001	03/29/88
(4,477,687)	(06/501,282)	(10/16/84)
Re. 33,039	06/839,695	08/29/89
(4,476,591)	(06/528,337)	(10/16/84)
Re. 33,044	06/919,233	09/05/89
(4,476,799)	(06/428,304)	(10/16/84)
4,476,593	06/406,353	10/16/84
4,476,595	06/409,284	10/16/84
4,476,599	06/395,410	10/16/84
4,476,606	06/508,022	10/16/84
4,476,607	06/428,650	10/16/84
4,476,621	06/462,739	10/16/84
4,476,622	06/573,222	10/16/84
4,476,627	06/391,472	10/16/84
4,476,632	06/402,944	10/16/84
4,476,636	06/378,478	10/16/84
4,476,643	06/473,387	10/16/84
4,476,652	06/402,331	10/16/84
4,476,662	06/315,849	10/16/84
4,476,665	06/326,912	10/16/84
4,476,667	06/482,426	10/16/84
4,476,669	06/432,855	10/16/84
4,476,674	06/387,296	10/16/84
4,476,675	06/355,662	10/16/84
4,476,679	06/234,177	10/16/84
4,476,684	06/476,825	10/16/84
4,476,688	06/454,424	10/16/84
4,476,701	06/380,679	10/16/84
4,476,706	06/340,074	10/16/84
4,476,709	06/408,896	10/16/84
4,476,717	06/266,563	10/16/84
4,476,719	06/377,425	10/16/84
4,476,720	06/387,950	10/16/84
4,476,729	06/384,367	10/16/84
4,476,734	06/472,900	10/16/84
4,476,741	06/383,495	10/16/84
4,476,748	06/331,392	10/16/84
4,476,749	06/579,288	10/16/84
4,476,764	06/409,737	10/16/84
4,476,765	06/498,086	10/16/84
4,476,772	06/439,065	10/16/84
4,476,781	06/430,761	10/16/84
4,476,782	06/385,773	10/16/84
4,476,789	06/413,516	10/16/84
4,476,791	06/498,006	10/16/84
4,476,793	06/325,620	10/16/84
4,476,805	06/260,829	10/16/84
4,476,814	06/474,564	10/16/84
4,476,815	06/431,264	10/16/84
4,476,816	06/436,246	10/16/84
4,476,818	06/543,542	10/16/84
4,476,824	06/318,801	10/16/84
4,476,827	06/459,965	10/16/84
4,476,836	06/455,827	10/16/84
4,476,837	06/447,535	10/16/84
4,476,841	06/499,459	10/16/84
4,476,844	06/419,305	10/16/84

Patent Number	Serial Number	Issue Date
4,476,845	06/428,834	10/16/84
4,476,853	06/424,868	10/16/84
4,476,857	06/458,035	10/16/84
4,476,873	06/415,042	10/16/84
4,476,888	06/400,669	10/16/84
4,476,902	06/408,010	10/16/84
4,476,905	06/526,509	10/16/84
4,476,916	06/287,091	10/16/84
4,476,917	06/279,070	10/16/84
4,476,918	06/392,441	10/16/84
4,476,921	06/363,142	10/16/84
4,476,923	06/359,477	10/16/84
4,476,926	06/363,765	10/16/84
4,476,945	06/465,407	10/16/84
4,476,947	06/277,521	10/16/84
4,476,948	06/392,068	10/16/84
4,476,959	06/388,691	10/16/84
4,476,960	06/406,617	10/16/84
4,476,963	06/325,643	10/16/84
4,476,969	06/367,509	10/16/84
4,476,974	06/313,005	10/16/84
4,476,978	06/381,490	10/16/84
4,476,981	06/372,660	10/16/84
4,476,982	06/433,245	10/16/84
4,476,983	06/358,868	10/16/84
4,476,992	06/425,556	10/16/84
4,476,996	06/348,350	10/16/84
4,476,998	06/357,592	10/16/84
4,477,002	06/404,768	10/16/84
4,477,003	06/345,288	10/16/84
4,477,011	06/416,502	10/16/84
4,477,012	06/449,149	10/16/84
4,477,013	06/529,925	10/16/84
4,477,020	06/296,349	10/16/84
4,477,022	06/351,560	10/16/84
4,477,027	06/378,453	10/16/84
4,477,028	06/382,483	10/16/84
4,477,032	06/395,037	10/16/84
4,477,038	06/427,034	10/16/84
4,477,041	06/409,684	10/16/84
4,477,053	06/577,637	10/16/84
4,477,054	06/431,312	10/16/84
4,477,062	06/342,607	10/16/84
4,477,063	06/285,541	10/16/84
4,477,075	06/267,418	10/16/84
4,477,076	06/254,957	10/16/84
4,477,079	06/408,300	10/16/84
4,477,089	06/401,926	10/16/84
4,477,099	06/450,050	10/16/84
4,477,100	06/326,341	10/16/84
4,477,103	06/375,170	10/16/84
4,477,106	06/431,872	10/16/84
4,477,108	06/378,840	10/16/84
4,477,109	06/288,129	10/16/84
4,477,111	06/320,200	10/16/84
4,477,124	06/332,735	10/16/84
4,477,125	06/419,685	10/16/84
4,477,132	06/433,064	10/16/84
4,477,134	06/576,788	10/16/84
4,477,136	06/437,688	10/16/84
4,477,140	06/464,238	10/16/84
4,477,143	06/446,806	10/16/84
4,477,146	06/244,527	10/16/84
4,477,157	06/393,726	10/16/84
4,477,158	06/311,663	10/16/84
4,477,174	06/396,104	10/16/84
4,477,175	06/450,868	10/16/84
4,477,177	06/466,401	10/16/84
4,477,183	06/445,079	10/16/84
4,477,187	06/342,539	10/16/84
4,477,192	06/392,401	10/16/84
4,477,193	06/447,527	10/16/84
4,477,197	06/574,524	10/16/84
4,477,199	06/345,301	10/16/84
4,477,202	06/541,452	10/16/84
4,477,210	06/425,082	10/16/84
4,477,213	06/530,614	10/16/84
4,477,215	06/321,574	10/16/84
4,477,221	06/338,055	10/16/84
4,477,224	06/417,338	10/16/84
4,477,225	06/344,105	10/16/84
4,477,232	06/456,597	10/16/84
4,477,234	06/416,996	10/16/84
4,477,249	06/489,793	10/16/84
4,477,254	06/450,755	10/16/84
4,477,264	06/480,448	10/16/84
4,477,276	06/421,331	10/16/84
4,477,280	06/452,292	10/16/84
4,477,281	06/434,489	10/16/84
4,477,294	06/489,632	10/16/84
4,477,295	06/408,420	10/16/84
4,477,301	06/493,691	10/16/84
4,477,302	06/505,430	10/16/84
4,477,303	06/345,357	10/16/84
4,477,304	06/510,046	10/16/84
4,477,306	06/402,466	10/16/84
4,477,309	06/430,177	10/16/84
4,477,311	06/561,967	10/16/84
4,477,312	06/498,668	10/16/84
4,477,316	06/351,302	10/16/84
4,477,317	06/547,194	10/16/84
4,477,322	06/499,135	10/16/84
4,477,328	06/354,830	10/16/84
4,477,340	06/416,286	10/16/84
4,477,352	06/475,148	10/16/84
4,477,357	06/529,483	10/16/84
4,477,373	06/385,155	10/16/84
4,477,374	06/394,530	10/16/84
4,477,378	06/416,513	10/16/84
4,477,382	06/451,826	10/16/84
4,477,385	06/463,164	10/16/84
4,477,393	06/384,847	10/16/84
4,477,394	06/489,367	10/16/84
4,477,395	06/368,388	10/16/84
4,477,396	06/328,890	10/16/84
4,477,399	06/389,032	10/16/84
4,477,400	06/577,335	10/16/84
4,477,404	06/376,978	10/16/84
4,477,407	06/467,823	10/16/84
4,477,409	06/229,767	10/16/84
4,477,418	06/525,716	10/16/84
4,477,425	06/561,788	10/16/84
4,477,430	06/404,822	10/16/84
4,477,431	06/225,005	10/16/84
4,477,433	06/348,134	10/16/84
4,477,436	06/484,963	10/16/84
4,477,437	06/347,871	10/16/84
4,477,445	06/469,042	10/16/84
4,477,450	06/471,837	10/16/84
4,477,451	06/482,004	10/16/84
4,477,453	06/423,104	10/16/84
4,477,456	06/370,137	10/16/84
4,477,461	06/426,893	10/16/84
4,477,463	06/376,650	10/16/84
4,477,468	06/447,037	10/16/84
4,477,473	06/457,326	10/16/84
4,477,476	06/453,826	10/16/84
4,477,483	06/478,469	10/16/84
4,477,484	06/448,574	10/16/84
4,477,486	06/579,300	10/16/84
4,477,490	06/470,156	10/16/84
4,477,491	06/422,475	10/16/84
4,477,506	06/391,874	10/16/84
4,477,511	06/418,206	10/16/84
4,477,518	06/307,182	10/16/84
4,477,523	06/536,825	10/16/84
4,477,532	06/493,798	10/16/84
4,477,544	06/539,644	10/16/84
4,477,547	06/455,998	10/16/84
4,477,548	06/562,043	10/16/84
4,477,553	06/566,778	10/16/84
4,477,554	06/545,434	10/16/84
4,477,566	06/381,777	10/16/84
4,477,568	06/419,800	10/16/84
4,477,569	06/349,905	10/16/84
4,477,572	06/383,361	10/16/84

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Patent Number	Serial Number	Issue Date
4,477,586	06/464,095	10/16/84
4,477,594	06/450,341	10/16/84
4,477,595	06/489,562	10/16/84
4,477,596	06/371,311	10/16/84
4,477,597	06/307,829	10/16/84
4,477,599	06/439,981	10/16/84
4,477,602	06/517,087	10/16/84
4,477,605	06/477,194	10/16/84
4,477,606	06/542,859	10/16/84
4,477,616	06/471,913	10/16/84
4,477,620	06/585,459	10/16/84
4,477,625	06/481,528	10/16/84
4,477,630	06/473,459	10/16/84
4,477,633	06/561,523	10/16/84
4,477,634	06/355,656	10/16/84
4,477,635	06/336,637	10/16/84
4,477,640	06/422,775	10/16/84
4,477,643	06/602,256	10/16/84
4,477,646	06/525,866	10/16/84
4,477,649	06/479,066	10/16/84
4,477,650	06/479,057	10/16/84
4,477,651	06/501,477	10/16/84
4,477,656	06/572,271	10/16/84
4,477,664	06/351,256	10/16/84
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5,155,674	07/667,583	10/13/92
5,155,694	07/606,082	10/13/92
5,155,702	07/617,628	10/13/92
5,155,709	07/727,760	10/13/92
5,155,710	07/588,768	10/13/92
5,155,714	07/425,161	10/13/92
5,155,757	07/718,300	10/13/92
5,155,762	07/439,399	10/13/92
5,155,765	07/737,356	10/13/92
5,155,771	07/879,711	10/13/92
5,155,775	07/260,423	10/13/92
5,155,784	07/784,969	10/13/92
5,155,790	07/532,932	10/13/92
5,155,793	07/645,469	10/13/92
5,155,798	07/312,949	10/13/92
5,155,808	07/379,017	10/13/92
5,155,811	07/304,662	10/13/92
5,155,820	07/313,704	10/13/92
5,155,827	07/325,289	10/13/92
5,155,841	07/586,944	10/13/92
5,155,847	07/227,799	10/13/92
5,155,861	07/612,858	10/13/92

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 10/18/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,350,527	06/310,475	10/13/81	09/21/82	10/24/96
4,629,607	06/686,993	12/27/84	12/16/86	10/23/96
4,727,626	06/809,610	12/16/85	03/01/88	10/23/96
4,747,315	06/500,809	06/03/83	05/31/88	10/21/96
4,757,865	06/932,706	11/19/86	07/19/88	10/23/96
4,976,732	06/649,909	09/12/84	12/11/90	10/24/96
5,007,557	07/495,806	03/19/90	04/16/91	10/23/96
5,123,258	07/734,628	07/23/91	06/23/92	10/22/96

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 10/25/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 32,631	06/884,728	07/10/86	03/29/88	11/01/96
Re. 33,576	07/384,146	07/21/89	04/23/91	10/31/96

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Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 34,186	07/774,578	10/10/91	03/02/93	10/31/96
4,418,740	06/247,292	03/26/81	12/06/83	10/31/96
4,442,326	06/398,403	10/10/91	04/10/84	10/31/96
4,563,808	06/632,667	07/20/84	01/14/86	10/31/96
4,576,301	06/537,680	09/30/83	03/18/86	10/31/96
4,603,333	06/521,722	08/09/83	07/29/86	10/31/96
4,655,390	06/904,455	09/08/86	04/07/87	10/31/96
4,677,798	06/852,021	04/14/86	07/07/87	10/31/96
4,703,465	06/804,803	12/04/85	10/27/87	10/31/96
4,717,402	06/656,708	10/01/84	01/05/88	10/31/96
4,740,375	06/705,023	02/25/85	04/26/88	10/31/96
4,818,905	06/808,629	12/13/85	04/04/89	10/31/96
4,943,063	07/330,055	03/29/89	07/24/90	10/28/96
4,954,300	07/366,757	06/14/89	09/04/90	10/31/96
4,955,566	07/420,911	10/13/89	09/11/90	10/31/96
4,960,271	07/229,488	08/08/88	10/02/90	10/31/96
5,037,836	07/555,887	07/23/90	08/06/91	10/31/96
5,053,046	07/579,105	09/06/90	10/01/91	10/31/96
5,056,704	07/158,797	02/22/88	10/15/91	10/30/96
5,057,423	07/134,717	12/18/87	10/15/91	10/31/96
5,063,896	07/568,870	08/17/90	11/12/91	10/30/96
5,071,819	07/236,763	08/26/88	12/10/91	10/31/96
5,116,110	07/318,671	03/03/89	05/26/92	10/29/96
5,117,366	07/372,730	06/28/89	05/26/92	10/31/96
5,126,153	07/625,017	12/10/90	06/30/92	10/31/96
5,127,720	07/605,128	10/24/90	07/07/92	10/31/96
5,129,737	07/646,193	01/28/91	07/14/92	10/30/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,718,008, Re. S.N. 08/726565, Oct. 4, 1996, Cl. 395, METHOD TO CONTROL PAGING SUBSYSTEM IN VIRTUAL MEMORY DATA PROCESSING SYSTEM DURING EXECUTION OF CRITICAL CODE SECT., Albert Chang et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2364

4,770,803, Re. S.N. 08/726874, Oct. 4, 1996, Cl. 252, AQUEOUS COMPOSITION CONTAINING NITROGEN-CONTAINING SALTS, John W. Forsberg, Owner of Record: *Inventor*, Attorney or Agent: Neil A. Du Chez, Ex. Gp.: 1105

4,926,547, Re. S.N. 08/558979, Nov. 13, 1995, Cl. 29/841, METHOD FOR MANUFACTURING A MODULAR SEMICONDUCTOR POWER DEVICE, Antonio P. Spatrisano et. al., Owner of Record: *SGS-Thomson Microelectronics SPA, Catanio, Italy*, Attorney or Agent: Richard K. Robinson, Ex. Gp.: 3206

5,301,159, Re. S.N. 08/628496, April 5, 1996, Cl. 365/225.7, ANTI-FUSE CIRCUIT AND METHOD WHEREIN THE READ OPERATION AND PROGRAMMING OPERATION ARE REVERSED, Ruojia Lee, Owner of Record: *Micron Technology Inc., Boise, Idaho*, Attorney or Agent: James R. Duzan, Ex. Gp.: 2511

5,347,568, Re. S.N. 08/723980, Sept. 13, 1996, Cl. 379/45, EMERGENCY CALL STATION IDENTIFICATION SYSTEM, Martin Moody et. al., Owner of Record: *Telident Inc., Minneapolis, Minn.*, Attorney or Agent: Lawrence M. Nawrocki, Ex. Gp.: 2608

5,355,167, Re. S.N. 08/728995, Oct. 10, 1996, Cl. 348/405, ORTHOGONAL TRANSFORM CODING APPARATUS, Tatsurou Juri, Owner of Record: *Matsushita Electric Industrial Co., Ltd., Osaka, Japan*, Attorney or Agent: Adam C. Volentine, Ex. Gp.: 2615

5,360,093, Re. S.N. 08/740750, Nov. 1, 1996, Cl. 194/206, METHOD AND APPARATUS FOR THE CONTROL OF A MULTIPLE OF DOOR ACCESSIBLE NEWSPAPER VENDING CABINETS WITH A SINGLE VEND CONTROL MECHANISM OPERATING REMOTE DOOR, LATCHES, Scott Baer, Owner of Record: *Kasper Wire Works Inc., Shiner, Tex.*, Attorney or Agent: Pamela B. Huff, Ex. Gp.: 3107

5,361,151, Re. S.N. 08/729929, Oct. 15, 1996, Cl. 359/65, REFLECTION-TYPE LIQUID CRYSTAL DEVICE WITH POLARIZATION OF OUTPUT LIGHT PERPENDICULAR TO THAT OF INPUT LIGHT, Tomio Sonehara et. al., Owner of Record: *Seiko Epsom Corp., Tokyo-To, Japan*, Attorney or Agent: Mark P. Watson, Ex. Gp.: 2515

5,368,619, Re. S.N. 08/716655, Sept. 6, 1996, Cl. 51/308, REDUCED VISCOSITY SLURRIES, ABRASIVE, Scott R. Culter, Owner of Record: *Minnesota Mining And Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Doreen S. L. Gwin, Ex. Gp.: 1108

5,418,585, Re. S.N. 08/713308, Sept. 13, 1996, Cl. 396/429, METHOD AND APPARATUS FOR PREVENTING UNAUTHORIZED RECYCLING OF SINGLE-USE CAMERA AND PERMITTING AUTHORIZED REUSE OF THE CAMERA, Dwight J. Petruchik et. al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: Roger A. Fields, Ex. Gp.: 3101

5,426,997, Re. S.N. 08/556042, Nov. 13, 1995, Cl. 74/594.1, BICYCLE CHAIN DRIVE ASSEMBLY, Donald G. Brion, Owner of Record: *Inventor*, Attorney or Agent: B. Craig Killough, Ex. Gp.: 3502

5,503,401, Re. S.N. 08/733520, Oct. 18, 1996, Cl. 273/306, METHOD OF PLAYING A CARD GAME, Son H. Nguyen, Owner of Record: *Inventor*, Attorney or Agent: Kenton R. Mullins, Ex. Gp.: 3304

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,427,720, Reexam. No. 90/004,441, Nov. 4, 1996, Cl. 264/40.6, METHOD FOR MOLD TEMPERATURE CONTROL, Werner Kotzab, Owner of Record: *Inventor*, Attorney or Agent: Robert F. Conte, Chicago, Ill., Ex. Gp.: 1307, Requester: Albert O. Cota, Encino, Calif.

5,452,906, Reexam. No. 90/004,440, Nov. 1, 1996, Cl. 279/062, NON-IMPACT KEYLESS CHUCK, Robert O. Huff, et. al., Owner of Record: *Power Tool Holders Inc., Wilmington, Del.*, Attorney or Agent: Mark C. Dukes, Dority & Manning, Greenville, S.C., Ex. Gp.: 3209, Requester: Clarence J. Fleming, Jones Day Reavis & Pogue, Chicago, Ill.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 26, 1996 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
107,316	71/088,007	11/23/1915
107,321	71/088,036	11/23/1915
107,323	71/088,039	11/23/1915
107,350	71/080,587	11/23/1915
107,368	71/087,278	11/23/1915
329,908	71/365,985	11/19/1935
329,911	71/366,061	11/19/1935
329,932	71/366,276	11/19/1935
329,947	71/366,848	11/19/1935
329,981	71/367,376	11/19/1935
329,989	71/362,715	11/19/1935
329,992	71/360,048	11/19/1935
329,995	71/352,473	11/19/1935
329,997	71/351,143	11/19/1935
329,998	71/367,197	11/19/1935
330,006	71/364,199	11/19/1935
330,018	71/367,430	11/19/1935
330,048	71/366,929	11/19/1935
330,059	71/365,134	11/19/1935
330,063	71/367,242	11/19/1935
330,084	71/366,406	11/19/1935
330,089	71/366,265	11/19/1935
330,094	71/366,894	11/19/1935
330,131	71/347,618	11/19/1935
330,148	71/367,137	11/19/1935
330,149	71/365,097	11/19/1935
330,151	71/365,096	11/19/1935
330,160	71/366,621	11/19/1935
330,161	71/366,618	11/19/1935
330,162	71/366,616	11/19/1935
589,109	71/648,175	04/27/1954
596,716	71/643,605	10/12/1954
616,377	71/675,471	11/22/1955
616,379	71/678,165	11/22/1955
616,384	71/679,513	11/22/1955
616,392	71/647,929	11/22/1955
616,400	71/676,140	11/22/1955
616,401	71/677,907	11/22/1955
616,406	71/679,995	11/22/1955
616,409	71/667,670	11/22/1955
616,413	71/682,669	11/22/1955
616,414	71/682,838	11/22/1955
616,418	71/652,613	11/22/1955
616,419	71/663,304	11/22/1955
616,421	71/666,895	11/22/1955
616,426	71/669,705	11/22/1955
616,428	71/673,146	11/22/1955
616,432	71/678,443	11/22/1955
616,433	71/681,114	11/22/1955
616,435	71/681,572	11/22/1955
616,436	71/681,835	11/22/1955
616,437	71/667,358	11/22/1955
616,438	71/670,827	11/22/1955
616,445	71/682,823	11/22/1955
616,449	71/683,699	11/22/1955
616,451	71/674,489	11/22/1955
616,452	71/680,026	11/22/1955
616,454	71/664,581	11/22/1955
616,460	71/681,483	11/22/1955
616,463	71/686,864	11/22/1955
616,464	71/686,875	11/22/1955
616,467	71/643,120	11/22/1955
616,472	71/668,335	11/22/1955
616,480	71/681,138	11/22/1955
616,498	71/634,486	11/22/1955
616,509	71/670,343	11/22/1955
616,512	71/672,400	11/22/1955
616,517	71/674,301	11/22/1955
616,532	71/680,780	11/22/1955
616,544	71/679,748	11/22/1955
616,546	71/679,968	11/22/1955
616,556	71/677,968	11/22/1955
616,573	71/672,944	11/22/1955
616,577	71/678,342	11/22/1955
616,578	71/678,857	11/22/1955
616,579	71/678,977	11/22/1955
616,593	71/672,914	11/22/1955
616,601	71/679,747	11/22/1955
616,619	71/667,892	11/22/1955
616,620	71/631,771	11/22/1955
616,623	71/667,979	11/22/1955
616,624	71/668,029	11/22/1955
616,626	71/671,642	11/22/1955
616,627	71/674,507	11/22/1955
616,628	71/674,894	11/22/1955
616,631	71/680,358	11/22/1955
616,640	71/659,995	11/22/1955
616,643	71/675,190	11/22/1955
616,645	71/677,555	11/22/1955
616,648	71/657,060	11/22/1955
616,652	71/678,544	11/22/1955
616,657	71/669,505	11/22/1955
616,680	71/607,406	11/22/1955
616,683	71/689,709	11/22/1955
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1,025,034	73/025,455	11/18/1975
1,025,037	73/040,369	11/18/1975
1,025,038	73/043,208	11/18/1975
1,025,040	73/044,719	11/18/1975
1,025,041	73/044,720	11/18/1975
1,025,045	73/047,816	11/18/1975
1,025,049	73/030,656	11/18/1975
1,025,050	73/031,819	11/18/1975
1,025,051	73/032,007	11/18/1975
1,025,055	73/042,247	11/18/1975
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1,025,060	73/045,886	11/18/1975
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1,025,072	73/038,700	11/18/1975
1,025,076	73/047,076	11/18/1975
1,025,077	73/047,146	11/18/1975
1,025,078	73/047,147	11/18/1975
1,025,081	73/048,210	11/18/1975
1,025,083	73/048,299	11/18/1975
1,025,085	73/048,785	11/18/1975
1,025,089	73/036,676	11/18/1975
1,025,091	73/041,281	11/18/1975
1,025,093	73/004,584	11/18/1975
1,025,096	73/016,223	11/18/1975
1,025,097	73/018,675	11/18/1975
1,025,100	73/025,017	11/18/1975
1,025,104	73/030,752	11/18/1975
1,025,105	73/034,768	11/18/1975
1,025,106	73/037,418	11/18/1975
1,025,107	73/038,199	11/18/1975
1,025,108	73/041,235	11/18/1975
1,025,112	73/042,804	11/18/1975
1,025,113	73/042,805	11/18/1975
1,025,114	73/043,435	11/18/1975
1,025,117	73/044,419	11/18/1975
1,025,118	73/045,734	11/18/1975
1,025,122	73/046,229	11/18/1975
1,025,123	73/046,402	11/18/1975
1,025,124	73/046,620	11/18/1975
1,025,126	73/020,816	11/18/1975
1,025,130	73/004,306	11/18/1975
1,025,133	73/019,422	11/18/1975
1,025,134	73/021,827	11/18/1975
1,025,139	73/027,243	11/18/1975
1,025,145	73/034,717	11/18/1975
1,025,146	73/034,732	11/18/1975
1,025,148	73/036,269	11/18/1975
1,025,150	73/036,592	11/18/1975
1,025,152	73/037,314	11/18/1975
1,025,159	73/045,731	11/18/1975
1,025,160	73/045,732	11/18/1975
1,025,161	73/045,737	11/18/1975
1,025,168	73/049,359	11/18/1975
1,025,169	73/011,328	11/18/1975
1,025,172	73/019,938	11/18/1975
1,025,174	73/022,697	11/18/1975
1,025,177	73/028,068	11/18/1975
1,025,179	73/032,430	11/18/1975
1,025,184	73/043,142	11/18/1975
1,025,185	73/043,697	11/18/1975
1,025,187	73/048,750	11/18/1975
1,025,189	73/007,266	11/18/1975
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1,025,191	73/018,108	11/18/1975
1,025,193	73/029,371	11/18/1975
1,025,196	73/042,911	11/18/1975
1,025,197	73/045,733	11/18/1975
1,025,198	73/045,738	11/18/1975
1,025,199	73/046,093	11/18/1975
1,025,200	73/046,687	11/18/1975
1,025,201	73/049,243	11/18/1975
1,025,203	73/007,295	11/18/1975
1,025,209	73/000,358	11/18/1975
1,025,227	73/034,233	11/18/1975
1,025,228	73/035,172	11/18/1975
1,025,233	73/037,742	11/18/1975
1,025,236	73/039,377	11/18/1975
1,025,239	73/018,296	11/18/1975
1,025,241	73/034,693	11/18/1975
1,025,243	73/041,408	11/18/1975
1,025,245	73/049,552	11/18/1975
1,025,247	73/031,480	11/18/1975
1,025,251	73/034,628	11/18/1975
1,025,252	73/020,525	11/18/1975
1,025,254	73/025,458	11/18/1975
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1,025,297	73/039,296	11/18/1975
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1,025,304	73/028,653	11/18/1975
1,025,306	73/037,751	11/18/1975
1,025,307	73/034,150	11/18/1975
1,025,308	73/034,475	11/18/1975
1,025,312	73/036,721	11/18/1975
1,025,320	73/030,795	11/18/1975
1,025,322	73/031,251	11/18/1975
1,025,324	73/033,119	11/18/1975
1,025,327	73/039,721	11/18/1975
1,025,329	73/047,138	11/18/1975
1,025,331	73/047,196	11/18/1975
1,025,335	73/018,748	11/18/1975
1,025,339	73/034,910	11/18/1975
1,025,342	73/039,900	11/18/1975
1,025,343	73/039,988	11/18/1975
1,025,344	73/040,178	11/18/1975
1,025,345	73/040,408	11/18/1975
1,025,352	73/035,660	11/18/1975
1,025,356	73/012,107	11/18/1975
1,025,357	73/026,351	11/18/1975
1,025,359	73/038,676	11/18/1975
1,025,367	73/035,748	11/18/1975
1,025,368	73/039,455	11/18/1975
1,025,374	73/016,971	11/18/1975
1,025,377	73/030,817	11/18/1975
1,025,381	73/000,188	11/18/1975
1,025,383	73/025,934	11/18/1975
1,025,384	73/025,936	11/18/1975
1,025,385	73/026,923	11/18/1975
1,025,389	73/041,925	11/18/1975
1,025,392	73/018,563	11/18/1975
1,025,393	73/048,046	11/18/1975
1,025,394	73/014,431	11/18/1975
1,025,401	73/025,929	11/18/1975
1,025,402	73/025,935	11/18/1975
1,025,404	73/039,518	11/18/1975
1,025,406	73/039,908	11/18/1975
1,025,409	73/044,070	11/18/1975
1,025,412	73/015,676	11/18/1975
1,025,415	73/021,280	11/18/1975
1,025,416	73/022,666	11/18/1975
1,025,423	73/029,319	11/18/1975
1,025,425	73/032,168	11/18/1975
1,025,426	73/032,185	11/18/1975
1,025,429	73/039,930	11/18/1975
1,025,430	73/044,159	11/18/1975
1,025,436	73/051,348	11/18/1975
1,025,437	73/051,349	11/18/1975
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1,025,451	72/449,282	11/18/1975
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1,025,453	72/435,707	11/18/1975
1,025,454	72/448,677	11/18/1975
1,025,458	72/456,050	11/18/1975
1,025,462	72/465,716	11/18/1975
1,025,469	72/460,314	11/18/1975
1,025,471	72/447,570	11/18/1975
1,025,472	72/457,574	11/18/1975
1,025,479	72/459,083	11/18/1975
1,025,480	72/455,986	11/18/1975
1,025,482	72/460,886	11/18/1975
1,025,483	72/370,973	11/18/1975
1,025,488	72/412,174	11/18/1975
1,025,492	72/459,773	11/18/1975
1,025,495	72/450,047	11/18/1975
1,025,497	72/445,791	11/18/1975
1,025,500	73/021,189	11/18/1975
1,025,502	73/029,586	11/18/1975
1,025,506	73/041,097	11/18/1975
1,025,514	73/042,437	11/18/1975

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrants at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Shuman dba Ras Associates, Norwell, Mass., Reg. No. 1,277,129, for the mark "NORTHEAST MOUNTAIN", Canc. No. 24,681.

Kontract Coatings, Inc., Nederland, Tex., Reg. No. 1,661,109, for the mark "KCI KONTRACT COATINGS, INC. and design", Canc. No. 25,474.

Amusement Investment Corp., Portege Des Sioux, Mo., Reg. No. 1,722,167, for the mark "HAMPTON", Canc. No. 25,297.

Bodylift, Inc., Houston Tex., Reg. No. 1,677,952, for the mark "BODYLIFT", Canc. No. 25,009.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Certificate of Correction
Issue for December 24, 1996

Re. 35,321	5,391,744	5,470,526	5,515,194
D. 366,829	5,391,796	5,472,191	5,516,055
D. 371,091	5,395,174	5,473,704	5,517,608
D. 371,975	5,397,746	5,476,861	5,517,653
D. 372,474	5,398,075	5,477,949	5,517,665
D. 374,009	5,403,304	5,479,362	5,518,567
D. 374,124	5,408,376	5,481,003	5,518,620
4,624,673	5,409,662	5,485,381	5,518,692
4,665,082	5,410,532	5,486,830	5,519,066
4,961,938	5,420,518	5,487,383	5,521,693
5,066,968	5,423,929	5,488,778	5,521,964
5,082,668	5,424,605	5,489,637	5,522,205
5,106,609	5,425,458	5,491,469	5,522,611
5,133,021	5,428,057	5,492,188	5,522,946
5,142,590	5,428,204	5,493,568	5,523,209
5,145,783	5,430,564	5,494,314	5,523,800
5,164,899	5,430,793	5,494,733	5,524,161
5,175,096	5,434,173	5,494,911	5,524,486
5,211,896	5,435,816	5,495,925	5,524,640
5,228,943	5,444,022	5,498,615	5,525,011
5,240,471	5,445,278	5,499,971	5,525,206
5,268,608	5,446,834	5,500,403	5,525,426
5,272,754	5,451,527	5,500,477	5,526,003
5,275,014	5,453,288	5,500,859	5,526,261
5,288,059	5,456,910	5,504,109	5,528,382
5,301,281	5,457,038	5,504,326	5,528,475
5,318,089	5,457,074	5,504,619	5,528,621
5,322,488	5,457,811	5,505,670	5,528,976
5,345,543	5,458,371	5,505,673	5,529,787
5,348,010	5,458,933	5,506,075	5,529,883
5,352,690	5,459,150	5,506,311	5,530,130
5,357,594	5,459,266	5,506,351	5,530,408
5,364,038	5,462,960	5,507,482	5,530,616
5,366,692	5,463,039	5,507,923	5,530,813
5,369,912	5,463,484	5,508,318	5,530,995
5,374,208	5,464,057	5,510,471	5,531,715
5,377,020	5,465,134	5,510,838	5,531,839
5,379,396	5,468,033	5,512,065	5,531,964
5,382,245	5,469,544	5,514,143	5,532,518
5,383,090	5,470,280	5,514,998	5,532,915
5,534,485	5,542,807	5,552,812	5,560,468
5,534,485	5,543,257	5,552,982	5,560,779
5,534,637	5,543,475	5,553,046	5,560,808
5,534,662	5,543,591	5,553,048	5,561,170
5,534,733	5,543,595	5,553,205	5,561,193
5,534,922	5,544,187	5,553,445	5,561,987
5,535,157	5,544,281	5,553,557	5,562,153
5,535,679	5,544,284	5,553,733	5,562,485
5,535,902	5,544,328	5,554,265	5,562,653
5,536,036	5,544,359	5,554,290	5,563,022
5,536,114	5,544,618	5,554,296	5,563,470
5,536,690	5,544,733	5,554,612	5,563,626
5,536,792	5,545,255	5,554,662	5,563,809
5,536,796	5,545,337	5,554,785	5,564,072
5,536,807	5,545,396	5,555,039	5,564,184
5,537,056	5,545,407	5,555,121	5,564,217
5,537,157	5,546,085	5,555,145	5,564,222
5,537,629	5,546,434	5,555,256	5,564,329
5,537,905	5,546,537	5,555,347	5,564,882
5,537,924	5,546,942	5,555,371	5,564,908
5,538,270	5,546,985	5,555,500	5,565,050
5,538,486	5,547,135	5,555,748	5,565,399
5,538,902	5,548,199	5,556,009	5,565,616
5,539,220	5,548,363	5,556,057	5,566,794
5,539,333	5,548,429	5,556,238	5,567,053
5,539,395	5,549,387	5,556,427	5,567,254
5,539,447	5,549,472	5,556,643	5,567,522
5,539,460	5,549,716	5,556,934	5,567,621
5,539,902	5,549,832	5,557,320	5,567,700
5,540,141	5,549,857	5,557,582	5,567,785
5,540,447	5,550,350	5,558,160	5,567,844
5,541,115	5,550,578	5,558,263	5,568,066
5,541,193	5,551,145	5,558,514	5,568,274
5,541,231	5,551,760	5,558,757	5,569,334
5,541,260	5,551,790	5,559,132	5,569,765
5,541,540	5,551,880	5,559,232	5,570,107
5,541,657	5,551,909	5,560,194	5,570,221
5,541,960	5,552,069	5,560,447	5,570,326

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Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

October 28 - November 1, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
10-29	OPP OPP	87,081 87,082	Sharkskins Surf Gear, Inc. v. San Jose Sharks	2(d); counterclaim for cancellation on grounds of (1) no bona fide use in commerce and (2) fraud	Oppositions Dismissed, Counterclaim for Cancellation Granted.	"SHARKSKINS" (and a design incorporating a shark's head) [surf clothing, namely, t-shirts, jackets, pants, warm-up suits, wetsuits, shoes and shorts]	design incorporating a fanciful representation of a shark [clothing—namely, shirts, jerseys, sweaters, sweatshirts, t-shirts, jackets, pants, sweatpants, warm-up suits, shorts, caps, hats, socks, nightshirts, scarves, mittens and cloth bibs, entertainment services—namely, providing professional ice hockey exhibitions]		No
10-30	EX EX EX EX	74/107,141 74/330,369 74/390,769 74/391,199	Orange Communications, Inc.	de jure functionality (of color)	Refusal Affirmed (in all four cases)		the color orange and the color yellow applied across the surface of applicant's goods [pay telephones and pay telephone booths]	Yes	
10-30	EX	74/509,007	Dynetatt Industries Inc.	2(d)	Refusal Affirmed		"POWER CLIMBER" [bicycles]	"CLIMBER" [bicycle structural parts]	No
11-1	EX	74/405,927	Crawford Fitting Co.	2(e)(1)	Refusal Affirmed		"TOOBENDER" [tube bending machines]		No

(1) EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

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Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Box NEW APP FEE	New trademark applications and fees.
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Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
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	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
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New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
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	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
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Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
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South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/19/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/26/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/03/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/01/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	01/15/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	01/15/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	05/25/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	02/15/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	02/25/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	04/30/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/03/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/10/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Acting Director	308-1113	07/02/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	06/15/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/14/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/14/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/03/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).

(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).

(3) All design patents are granted for a term of 14 years from the date of the grant.

However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

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TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of November 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/29/96	08/12/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/18/96	05/02/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/02/96	10/18/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/13/96	08/15/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/07/96	06/07/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/10/96	08/16/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/31/96	07/29/96
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services-Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/10/96	06/14/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/18/96	07/30/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	09/03/96	—0—
Renewals (All Classes)	09/19/96	—0—
Section 12(c) Publications (All Classes)	04/05/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

DECEMBER 24, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,981,472 (3081st)

CANNULA ASSEMBLY FOR SYRINGE

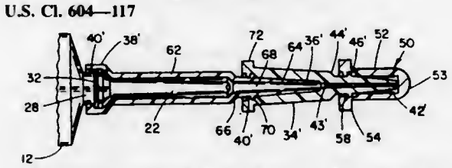
James F. Ennis, III, Preston, Conn., and Mark Anderson, R.R. 2, Elmwood, Wis. 54740, assignors to Mark Anderson, Elmwood, Wis.

Reexamination Request No. 90/003,123, Jul. 9, 1993.

Reexamination Certificate for Patent 4,981,472, issued Jan. 1, 1991, Ser. No. 439,180, Nov. 20, 1989.

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—117



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7–10** is confirmed.

Claims **1–6** and **11–16** are cancelled.

7. A cannula assembly for a syringe adapted for discharging medicinal fluid into a teat of an animal being treated comprising:

a first cannula having an elongated first body of predetermined axial length terminating in a first free open end for discharging said fluid therefrom,

a first tubular jacket enclosing said cannula in axial alignment therewith;

first means on said cannula and said jacket for detachably engaging together with cannula and said jacket;

a second cannula integral with said jacket and extending axially forward of said open end of said first cannula in axial alignment therewith for receiving said fluid from said first cannula, said second cannula having an elongated body shorter in axial length than that of said first cannula and having a second free open end for discharging said fluid therefrom;

a second tubular jacket enclosing said second cannula in axial alignment therewith;

second means on said second cannula and said second jacket for detachably engaging together said second cannula and second jacket;

a third cannula integral with said second jacket and extending axially forward of said open end of said second cannula in axial alignment therewith for receiving said fluid from said second cannula, said third cannula having an elongated third body shorter in axial length that of said second cannula and having a third free open end for discharging said fluid therefrom;

a tubular cap having opposite closed and open ends, said cap enclosing said third cannula when waid third cannula is axially inserted into said cap through said open end of said cap; and

third means on said third cannula and said cap for detachably engaging together with third cannula and said cap;

whereby a user can select said third cannula for discharging said fluid by detaching said cap from said third cannula, whereby said user can select said second cannula for discharging said fluid by detaching said second jacket from said second cannula, and whereby said user can select said first cannula for discharging said fluid by detaching said first jacket for said first cannula.

B1 5,138,028 (3082nd)

POLYIMIDES END-CAPPED WITH DIARYL SUBSTITUTED ACETYLENE

Charles W. Paul, Madison; Rose A. Schultz, Princeton, and Steven P. Fenelli, Hillsborough, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Reexamination Request No. 90/004,069, Nov. 3, 1995.

Reexamination Certificate for Patent 5,138,028, issued Aug. 11, 1992, Ser. No. 823,508, Jan. 21, 1992.

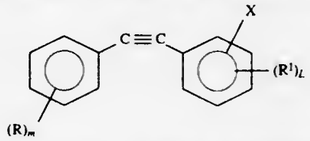
Int. Cl.[6] C08G *69/26;8/02;75/00;* **C08F** *22/40*

U.S. Cl. 528—353

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–32** is confirmed.

1. A polymerizable oligomer selected from the group consisting of polyamic acids, corresponding amic esters, corresponding isoimides, corresponding imides, and mixtures thereof, and wherein said polymerizable oligomer is end-capped with a diaryl substituted acetylene (DASA) having the general formula:



wherein m=0 to 5, L=0 to 4, R and R^1 are independently selected from the group consisting of halogen, C_1–C_4 alkyl, alkoxy, aryloxy, haloaryl, haloalkyl, haloacyl, aryl, and acyl, and X is a linking group to the oligomer backbone selected from the group consisting of NH_2, CHO, isocyanate, anhydride, carboxylic acid, ester, and acyl halide; provided that m or L≠0 when the oligomer backbone is composed of 2,2-bis(3,4-dicarboxyphenyl) hexafluoropropane dianhydride and 1,3-bis(3-amino-phenoxy) benzene and $X=NH_2$; and said polymerizable oligomer must have a glass transition temperature (Tg) greater than 135° C. after imidization, but prior to the onset of cure of the DASA end-caps.

B1 5,217,937 (3083rd)

SiO_2-CONTAINING COPPER OXIDE-CHROMIUM OXIDE CATALYST FOR THE HYDROGENATION OF FATTY ACIDS AND FATTY ESTERS

Michael Schneider, Ottobrunn-Riemerling; Gerd Maletz, Brückmühl, and Karl Kochloefl, Brückmühl/Heufeld, all of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Germany

Reexamination Request No. 90/003,937, Aug. 29, 1995.

Reexamination Certificate for Patent 5,217,937, issued Jun. 8, 1993, Ser. No. 795,493, Nov. 21, 1991.

Claims priority, application Germany, Nov. 27, 1990, 4037729

Int. Cl.[6] B01J *21/06;21/08;23/10;23/26;23/72*

U.S. Cl. 502—242

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. An acid-resistant catalyst for the hydrogenation of fatty acids or fatty acid esters or mixtures thereof which consists essentially of (in analytical terms) about 20 to about 70 weights percent CuO, about 20 to about 70 weight percent Cr_2O_3, about 1 to about 25 weight percent SiO_2 having a porosity (determined by the nitrogen adsorption method) of <0.1 cm^3/g, and 0 to about 15 weight

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percent of additional metal oxide selection from zirconium, cerium, or lanthanum oxide or mixture thereof, wherein said catalyst, after thermal treatment of the metal oxides or precursor compounds convertible into the oxides, has a specific surface area of about 8 m^2/g to about 60 m^2/g wherein the intensity ratio between the x-ray diffraction lines (XRD reflexes) of the copper oxide with d=0.232 nm and of the $CuCr_2O_4$ spinel with d=0.240 nm determined as a ratio of the reflex amplitudes is about 0.7 to about 40:1 and wherein the acid resistance as measured by the solubility of the copper in the catalyst in acid is a maximum of 200 mg as determined by stirring 10 grams of the catalyst in 10 weight percent acetic acid at 20° C. for 2 minutes.

REISSUES

DECEMBER 24, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,408

NASAL DEVICES

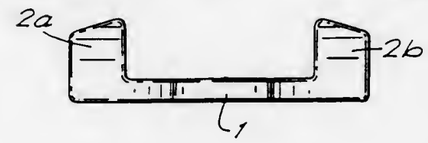
Bjorn Petruson, Goteborg, Sweden, assignor to Patent Development & Investment S.A., Luxembourg, Luxembourg

Original No. 5,479,944, dated Jan. 2, 1996, Ser. No. 701,621, May 14, 1991. Continuation of Ser. No. 391,010, May 17, 1989, abandoned. Application for reissue Mar. 28, 1996, Ser. No. 623,608

Claims priority, application United Kingdom, May 17, 1989, 8627600

Int. Cl.[6] A61F *11/00*

U.S. Cl. 128—858 **59 Claims**



1. A one-piece device for positioning in the nose comprising:

(i) a pair of tabs for positioning in respective nostrils; and

(ii) an elongate connecting member resiliently interconnecting the tabs;

wherein:

(a) each tab is resilient and has a surface for engaging the outer side wall of the respective nostril, is relatively thin [se] *so* to project a relatively small distance from the outer side wall into the passage of the respective nostril and is formed from a resilient, relatively soft material whereby said surface may conform to the contours of said respective side wall;

(b) the connecting member is of a length sufficient to follow a path from one tab to the other over the septum of the nose;

(c) said connecting member is resiliently bendable from an inoperative configuration into an operative configuration in which the tabs are positioned within the nostrils, the connecting member follows said path over the septum, and there is a restoring force tending to return said connecting member to the inoperative configuration; and

(d) the restoring force is sufficient to maintain the device in the nose of a user by means of engagement of the tabs with their respective nostril by means of the tabs urging the respective side walls outwardly.

Re. 35,409

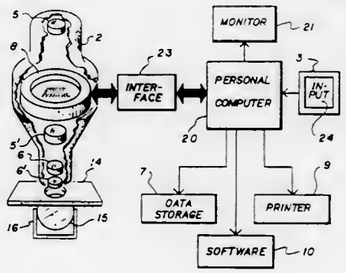
ELECTRICALLY ADDRESSABLE OPTO-ELECTRONIC INDICATOR FOR MAKING DYNAMIC EVALUATIONS OF MICROSCOPIC OR LARGER SUBJECTS

Sidney D. Moore, 760 Mansfield Dr., Claremont, Calif. 91711

Original No. 4,720,804, dated Jan. 19, 1988, Ser. No. 915,145, Oct. 3, 1986. Continuation-in-part of Ser. No. 638,896, Aug. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 422,823, Sep. 24, 1982, Pat. No. 4,531,052. Application for reissue Dec. 6, 1993, Ser. No. 165,015

Int. Cl.[6] G02B *21/00;* **G06F** *17/00*

U.S. Cl. 364—525 **18 Claims**



1. An optical instrument for examining and evaluating a specimen wherein the instrument has an optical axis, comprising:

means mounted on said optical axis of the instrument for producing an image of the specimen on a plane of focus disposed on said optical axis;

opto-electronic indicator means mounted within the instrument on said optical axis for generating a multiplicity of electrically-addressable indicia which are visible on said plane of focus on the optical axis of the instrument for simultaneous viewing with the image of the specimen; and

processor means for selectively addressing each of said indicia to cause said indicia to become visible on said plane of focus for viewing thereon With the specimen and for processing the addresses of the selected indicia to define a relationship between the selected india and the specimen.

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PLANT PATENTS

GRANTED DECEMBER 24, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,757

STRAWBERRY PLANT NAMED 'AIRES'

Jose M. A. Lopez, Navarra, Spain, assignor to Plantas de Navarra, S.A., Navarra, Spain

Filed Aug. 9, 1995, Ser. No. 512,886

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. A new and distinct variety of strawberry plant, substantially as shown and described.

9,758

CARNATION PLANT NAMED 'VELVET'

Flavio Sapia, San Remo, Italy, assignor to Messick Company, Saratoga, Calif.

Filed Aug. 21, 1995, Ser. No. 517,106

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—70.7 **1 Claim**

1. A new and distinct cultivar of Carnation plant named Velvet, as illustrated and described.

9,759

CARNATION PLANT NAMED 'PACO'

Flavio Sapia, San Remo, Italy, assignor to Messick Company, Saratoga, Calif.

Filed Aug. 21, 1995, Ser. No. 517,110

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—70.7 **1 Claim**

1. A new and distinct cultivar of Carnation plant named Paco, as illustrated and described.

9,760

CHRYSANTHEMUM PLANT NAMED 'PEACH CINDERELLA'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 7, 1995, Ser. No. 525,312

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Peach Cinderella, as described and illustrated.

9,761

GERANIUM PLANT NAMED 'FISALB'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,892

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisalb, as illustrated and described.

9,762

GERANIUM PLANT NAMED 'FISBRARIS'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,893

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisbraris, as illustrated and described.

9,763

GERANIUM PLANT NAMED 'FISVIDEO'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Benningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,895

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new distinct cultivar of geranium plant named Fisvideo, as illustrated and described.

9,764

GERANIUM PLANT NAMED 'FISBLU'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,896

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new distinct cultivar of geranium plant named Fisblu, as illustrated and described.

9,765

GERANIUM PLANT NAMED 'FISBRAVO'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,897

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisbravo, as illustrated and described.

9,766

GERANIUM PLANT NAMED 'HWD CORELLI'

Gabriele Harring, Kerpen, Germany, assignor to Dummen Jungpflanzenkulturen, Rheinberg-Eversael, Germany

Filed Aug. 30, 1995, Ser. No. 520,860

Claims priority, application Germany, May 16, 1988, PEL 308

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant named HWD Corelli, as illustrated and described.

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9,767

GERANIUM PLANT NAMED 'HWD RAVELINA'

Günter Dümmen, Rheinberg-Eversael, Germany, assignor to Dummen Jungpflanzenkulturen, Rheinberg-Eversael, Germany

Filed Aug. 30, 1995, Ser. No. 521,401

Int. Cl.[6] A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant named HWD Ravelina, as illustrated and described.

9,768

GUZMANIA 'PUNA GOLD'

David R. Shiigi, 35 Pau O Palae St., Hilo, Hi. 96720

Filed Jul. 20, 1995, Ser. No. 510,136

Int. Cl.[6] A01H 5/00

U.S. Cl. Plt.—88.8 1 Claim

1. A new and distinct hybrid cultivar named Guzmania "Puna Gold" obtained by crossing *Guzmania memoria* (*G. lingulata* variety minor crossed with *G. lingulata* variety major) and *Guzmania insignis* (*G. lingulata* variety splendens with *G. zahnii*) substantially as illustrated and described herein.

PATENTS

GRANTED December 24, 1996

ERRATA

For CLASS	See PATENT NO.
056–367	5,586,421
140–123	5,586,584
141–021	5,586,629
206–315	5,586,674
236–093	5,586,722
473–207	5,586,761
294–001	5,586,801
296–026	5,586,802
445–024	5,586,879
510–298	5,587,104
323–312	5,587,655
396–319	5,587,751
396–315	5,587,752
396–397	5,587,753
396–144	5,587,754
396–380	5,587,755
396–515	5,587,756
396–536	5,587,757
396–613	5,587,758
396–630	5,587,759
396–630	5,587,760
396–095	5,587,761
396–095	5,587,762
396–114	5,587,763
396–055	5,587,764
396–234	5,587,765
396–257	5,587,766
386–068	5,587,789
386–026	5,587,802
386–033	5,587,803

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ERRATA–CONTINUED

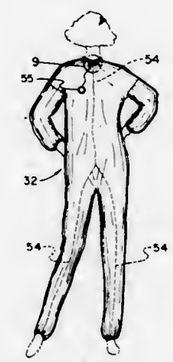
For CLASS	See PATENT NO.
386–002	5,587,804
386–068	5,587,805
386–068	5,587,806
386–046	5,587,807
349–062	5,587,816
349–187	5,587,817
349–106	5,587,818
349–106	5,587,819
349–116	5,587,820
349–118	5,587,821
349–124	5,587,822
395–752	5,587,902
395–759	5,587,903
370–337	5,588,020
382–167	5,588,050

PATENTS

GRANTED DECEMBER 24, 1996

GENERAL AND MECHANICAL

5,586,339
OUTER PROTECTIVE GARMENT APPARATUS
Betty S. Lathan, P.O. Box 184 Keuer Rd., Mount Airy, Ga. 30563
Continuation of Ser. No. 55,276, May 3, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,252
Int. Cl.[6] A41D *1/00;13/00;27/00*
U.S. Cl. 2—46 **5 Claims**



1. A new and improved outer protective garment apparatus, comprising:

torso covering assembly means for protecting a torso of a wearer, said torso covering assembly means including an elastic, snugly-fitting, neck-encompassing assembly means for snugly fitting around the wearer's neck and for protecting the wearer's torso from contamination by entry of a contaminant via the wearer's neck,

two arm covering assembly means, connected to said torso covering assembly means, for protecting a wearer's arms, each of said arm covering assembly means including an elastic, snugly-fitting, wrist-encompassing assembly means for snugly fitting around a wrist of the wearer and for protecting the wearer's arms from contamination by entry of a contaminant via the wearer's wrists, and

pants assembly means, connected to said torso covering assembly means, said pants assembly means including an abdomen covering assembly means and two leg covering assembly means, each of said leg covering assembly means including an elastic, snugly-fitting, ankle-encompassing assembly means for snugly fitting around an ankle of the wearer and for protecting the wearer's legs and abdomen from contamination by entry of a contaminant via the wearer's ankles,

wherein each of said elastic, snugly-fitting, neck-encompassing assembly means, said elastic, snugly-fitting, wrist-encompassing assembly means, and said elastic, snugly-fitting, ankle-encompassing assembly means includes an elastic element and includes thermoplastic material which retains said elastic element by a seam joined by heat welds which form a single melted region,

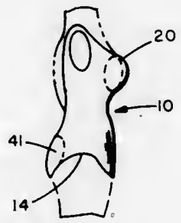
wherein said torso covering assembly means and said arm covering assembly means are formed into a unified integrated structure,

wherein said torso covering assembly means includes a first side assembly and a second side assembly, wherein said first side assembly includes a strip of contact adhesive material covered by a barrier sheet, such that said torso covering assembly means can be put on by the wearer, said barrier sheet can be removed, and said first side assembly can be adhered to said second side assembly,

wherein said torso covering assembly means further includes an interior surface and an exterior surface,

a rip cord is attached to said interior surface of said torso covering assembly means, such that when said rip cord is pulled in a direction outward from said interior surface, said torso covering assembly means is torn apart by said rip cord, permitting removal of the outer protective garment apparatus, wherein the said pants assembly includes an interior surface and an exterior surface and said rip cord is also attached to said interior surface of said pants assembly means, such that when said rip cord is pulled in a direction outward from said interior surface, said pants assembly means is torn apart by said rip cord, permitting removal of the outer protective garment apparatus.

5,586,340
MULTIFUNCTION SWIMSUIT AND CASUAL WEAR UNDERGARMENT
Peter J. Russo, 150 Rockland Rd., Guilford, Conn. 06437
Filed Oct. 5, 1994, Ser. No. 318,083
Int. Cl.[6] A41D *7/00*
U.S. Cl. 2—67 **1 Claim**



1. A dual purpose molded swimsuit and undergarment for being worn by a person, comprising:

a resilient waterproof, elastomeric material being contoured for tightly encasing at least a portion of the person's torso, including a portion of the abdomen, hips, crotch, bosoms and buttocks area, and having portions defining a pair of legholes;

a prosthetic bra means being secured within the swimsuit at the front bosom regions and valve means for enabling selective pneumatic pressurization of each of said prosthetic bra bosom regions to a size and pressure for wearer customizing and selective enlargement of each of the bosom bulge regions of said swimsuit for selectively enhancing at least one bosom bulge swimsuit contour to a wearer selected size and for providing increased buoyance to the wearer of said swimsuit to facilitate floating and swimming activities, said swimsuit material being molded to form a relatively fade and stain resistant design pattern without stitched seams;

the prosthetic bra means being integrally formed with the swimsuit and undergarment to have a sealed pocket section and a valve means to enable air to be put into said pocket to a pneumatic pressure in excess of the ambient air pressure; and

a relatively intricate and colorful design member being integrally molded into the elastic material;

and a pair of prosthetic pneumatically inflatable buttock enlarging members integrally molded into said swimsuit and undergarment;

at least one cut out section of selected design for revealing predetermined torso sections of the wearer.

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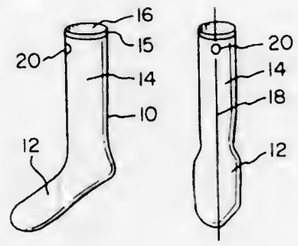
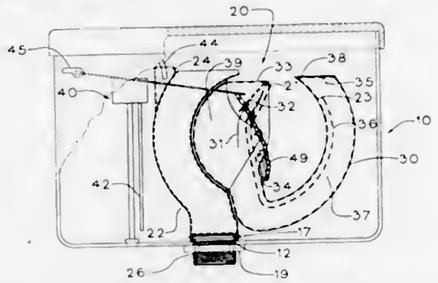
5,586,341
STOCKINGS AND METHODS THEREFORE
Bruce U. Hill, Jr., 735 Field Club Rd., Pittsburgh, Pa. 15238
Filed Sep. 29, 1995, Ser. No. 537,088
Int. Cl.[6] A41B *11/00*
U.S. Cl. 2—239 **7 Claims**



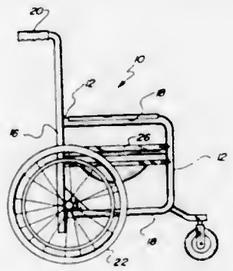
1. A stocking comprising:
a foot section;
a sleeve section extending upwardly from said foot section to at least midcalf in length, said sleeve section having a lower surface attached to said foot section and an upper section adjacent an opening adaption to receive the user's foot and leg; and
an orientation marker positioned only on said upper section of said sleeve section on a front side of said sleeve section, said orientation marker lying in a vertically extended plane which substantially symmetrically bisects said stocking, wherein said foot section and said lower surface of said sleeve section are free of said orientation marker.

5,586,342
ROTARY SIPHON FLUSHER
Randy C. Young, 201 Bridgecreek Dr., Myrtle Beach, S.C. 29575
Filed Jun. 6, 1995, Ser. No. 471,857
Int. Cl.[6] E03D *1/06*
U.S. Cl. 4—368 **11 Claims**



1. A rotary siphon flushing device for discharging a liquid from a liquid tank through a tank drainage port into a connected bowl, said rotary siphon flushing device comprising, in combination:
a. a siphon exhaust pipe having an open-air end and a tank insertion end connected to said tank drainage port;
b. a rotary pipe axially and movably secured to an axis point centrally located to said rotary siphon flushing device, said rotary pipe further comprising a tube insert member and a tube ballast member, said tube ballast member being adjacent to said siphon exhaust pipe when said liquid tank is filled and having a fill end, said tube insert member having a discharge end; and
c. a lever means for rotating said rotary pipe around said axis point such that said tube insert member inserts inside said open-air end of said siphon exhaust pipe when said liquid tank is full inducing a siphoning action by initiating a continuous flow of said liquid from said fill end of said tube ballast member through said discharge end of said tube insert member.

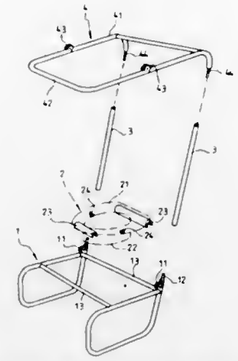
5,586,343
WHEEL CHAIR WITH A REMOVABLE TOILET BOWL AND SEAT
Dawn M. Mayle, 827 W. River Rd. N., Elyria, Ohio 44035
Filed Aug. 21, 1995, Ser. No. 517,731
Int. Cl.[6] A47K *11/06;* **A61G** *7/02*
U.S. Cl. 4—480 **5 Claims**



1. A wheel chair with a removable toilet bowl and seat, comprising:
a frame having two forward vertical rails and two rearward vertical rails with horizontal rails coupled therebetween to form a wheel chair with a push handle at the upper extent of the rearward vertical rails and wheels rotatably secured to the lower extent of the frame;
a pair of upper slide rails in a horizontal orientation and spaced parallel with respect to each other and coupled at their forward ends to the forward vertical rail and coupled at their rearward ends to the rearward vertical rail;
a pair of lower slide rails in a horizontal orientation and spaced parallel with respect to each other and coupled at their forward ends to the forward vertical rail and coupled at their rearward ends to the rearward vertical rail;
a pair of upper channels formed in the upper slide rails facing each other and laterally spaced by a first predetermined distance;
a pair of lower channels formed in the lower slide rails facing each other and laterally spaced by a first predetermined distance;
an upper tray formed in a planar configuration with enlarged horizontal lateral edges received in the upper channels and formed with a central planar surface to constitute a seat for a user; and
a lower tray with enlarged horizontal lateral edges received in the lower channels, the central extent of the lower tray being formed with a recess to function as a toilet.

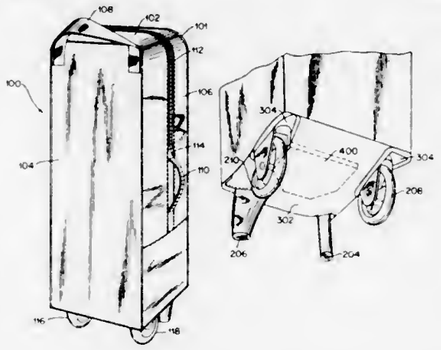
5,586,344
PORTABLE TOILET
Tui-Chang Liang, No. 126, Sec. 1, Kuang Fu Road, San Chung City, Taiwan
Filed Jun. 13, 1995, Ser. No. 489,813
Int. Cl.[6] A47K *11/02*
U.S. Cl. 4—484 **4 Claims**

1. A portable toilet, comprising:
a base including two tubular side members connected transversely by two horizontal tubes, and an insert tube pivotably connected by a bending part to each of the two tubular side members so that each insert tube is capable of approximately a 90 degree displacement relative to a tubular side member;



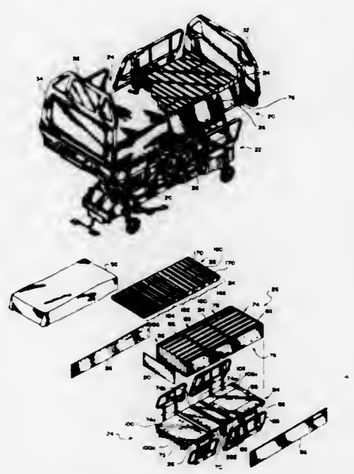
a bowl having a seat and a container which is integral with the seat, the seat having a bottom with a front, rear, left side and right side, a recessed member disposed at the front and rear of the seat bottom to receive and mate with the two horizontal tubes, a hook disposed at each of the right and left sides of the seat bottom, said hooks adapted to have a waste bag suspended therefrom
an upper frame including two generally n-shaped tubes which are pivotably connected to each other at ends thereof by bending parts and are thereby capable of being pivotably disposed by approximately 180 degrees to each other, and one of the generally n-shaped tubes has two spaced-apart bent members extending therefrom and an inert tube extending from each of the two bent members;
two suspension tubes whose diameter is larger than the diameters of the insert tubes of the base and the upper frame, each suspension tube having opposite ends, with one end of each suspension tube mating with an insert tube of the base and an opposite end of each suspension tube mating with an insert tube of the upper frame, thereby connecting the upper frame to the base,
a cloth cover extending downward from the upper frame to cover all of said portable toilet; and
a trunk for storing the portable toilet in a disassembled condition.

5,586,345
MOBILE PORTABLE PLAYYARD SYSTEM
Robert A. Nielsen, Morgantown, Pa., and Vladimiro Pizzi, Scanzorosciate, Italy, assignors to Graco Children's Products, Elverson, Pa.
Filed Nov. 9, 1995, Ser. No. 556,057
Int. Cl.[6] A47D *7/00;* **B65D** *65/02*
U.S. Cl. 5—99.1 **17 Claims**



1. A mobile portable playyard system which is easily transportable, comprising:
a playyard structure which collapses into a generally rectangular shape including a plurality of corner legs, at least one corner leg having a foot attached thereto and at least one corner leg having a wheel attached thereto; and
a carrying case having a top portion, a side portion, and a bottom portion, the bottom portion defining a wheel opening formed through the bottom portion such that the wheel can extend therethrough, and defining a foot opening formed through the bottom portion such that the foot can extend therethrough.

5,586,346
METHOD AND APPARATUS FOR SUPPORTING AND FOR SUPPLYING THERAPY TO A PATIENT
Richard B. Stacy; Craig D. Ellis, both of Charleston; Barry D. Hand; James M. C. Thomas, both of Mt. Pleasant; Kenith W. Chambers; Stephen E. Glover, both of Charleston; Richard I. Barnett; Paul B. King, both of Mount Pleasant, all of S.C.; Ryszard S. Ozarowski, Marietta, Ga., and William T. Sutton, Charleston, S.C., assignors to Support Systems, International, S.C.
Filed Feb. 15, 1994, Ser. No. 196,847
Int. Cl.[6] A61G *7/04*
U.S. Cl. 5—710 **38 Claims**



1. A patient support surface, comprising:
a support assembly;
a first longitudinal cushion set coupled to said support assembly, said first longitudinal cushion set including a plurality of generally parallel cells, and extending a portion of the longitudinal length of said support assembly;
a second longitudinal cushion set coupled to said support assembly, said second longitudinal cushion set including a plurality of generally parallel cells and also extending a second, longitudinally offset portion of the longitudinal length of said support assembly; and
an inflatable support layer disposed generally above said first and second longitudinal cushion sets.

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5,586,347

MATTRESS WITH AN INTEGRATED AIR SYSTEM

Willi Frischknecht, Schönengrund, Switzerland, assignor to Airlux AG, Regensdorf, Switzerland

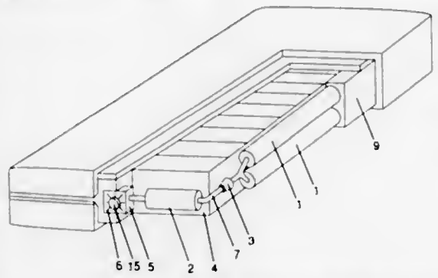
PCT No. PCT/CH93/00110, § 371 Date Sep. 15, 1994, § 102(e) Date Sep. 15, 1994, PCT Pub. No. WO93/21803, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 30, 1993, Ser. No. 295,751

Claims priority, application Switzerland, May 6, 1992, 1449/92

Int. Cl.[6] A47C *27/08*

U.S. Cl. 5—713 **11 Claims**



1. A mattress for beds or seating furniture, the mattress comprising:

a cushion, an air cell, and an in-the-mattress pump system wherein the pump system comprises: a pump body, an air reservoir and a pressure regulating valve, wherein the air cell is connected to the pump system so that said pump system replenishes air lost from said air cell with air from the air reservoir and regulates pressure in the air cell by the pressure regulating valve.

5,586,348

AIR MATTRESS AND METHOD FOR ADJUSTING IT

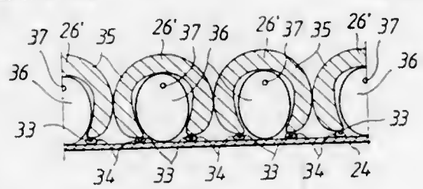
Ilkka Toivio; Terttu Toivio, both of Lahti, and Kari Olkkonen, Kauttua, all of Finland, assignors to Ahlstrom Consumer Products Ltd., Finland

Continuation-in-part of Ser. No. 625,940, Dec. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 209,978, Jun. 22, 1988, Pat. No. 4,999,867. This application Jan. 27, 1993, Ser. No. 9,648

Claims priority, application Finland, Jun. 24, 1987, 872813

Int. Cl.[6] A47C *27/10*

U.S. Cl. 5—710 **26 Claims**



1. A mattress, comprising:

a bottom part;

a plurality of elongate, bag-like first mattress elements, each said first mattress element enclosing a first fluid chamber for a flowing medium, said first elements being essentially parallel to each other and transverse to the longitudinal axis of said mattress, and said first elements being fixed to said bottom part at least at one fixing joint essentially parallel to the longitudinal direction of the mattress element, two mattress elements at the most constitute an arched structure, which is directed upward from the bottom part and is transverse to the longitudinal direction of the mattress, the fluid chambers of the mattress elements being inflatable with a flowing medium up to a suitable pressure while using the mattress; and

wherein the first mattress elements are divided, in the direction of the longitudinal axis of the mattress, into at least three groups, the elements of each of these groups being connectable, via conduits, to a fluid supply, so that the fluid pressure in the elements of each group can be adjusted to be suitable when the mattress is being used.

5,586,349

TROLLEYS

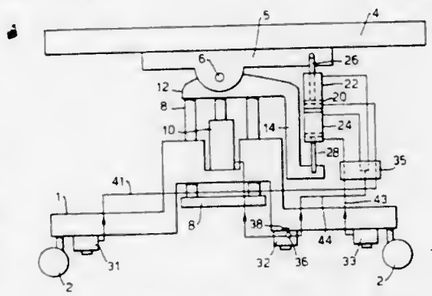
Keith Hannant, Rustington, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Feb. 17, 1995, Ser. No. 390,518

Claims priority, application United Kingdom, Mar. 4, 1994, 9404181

Int. Cl.[6] A47B *9/10;* **A47C** *19/04*

U.S. Cl. 5—614 **5 Claims**



1. A trolley comprising: a base; a support column; a first mechanism for altering the height of the support column; a top surface supported by said column above said base; a second mechanism for altering the angle of said top surface relative to said support column, said first and second mechanisms being so interconnected that the height of said support column cannot be increased without automatically causing said top surface to move to a horizontal position; said first mechanism including an hydraulic actuator and a pump, said first mechanism being operative to initially supply hydraulic fluid to an actuator in said second mechanism for altering the angle of said top surface and to subsequently supply hydraulic fluid to said actuator in said first mechanism for altering the height of said support column; said trolley including an overpressure valve, an hydraulic line connecting said valve between said pump and said actuator in said first mechanism, an hydraulic line connected between said pump and said actuator in said second mechanism, said overpressure valve being closed at low pressure such that fluid from said pump flows to said actuator in said second mechanism until said top surface is horizontal, and wherein fluid pressure increases after said top surface is horizontal thereby causing said valve to open and to allow fluid to flow to said actuator in said first mechanism.

5,586,350

LOW FLAMMABILITY PILLOW

Franz Thönnessen, Bobingen, and Hans H. Mühlhaus, Kriftel, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

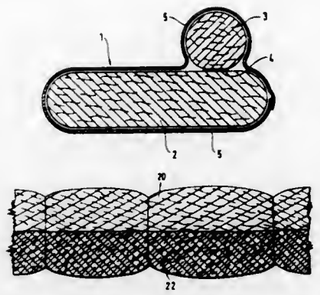
Filed Jun. 28, 1994, Ser. No. 267,426

Claims priority, application Germany, Jun. 30, 1993, 9309699 U

Int. Cl.[6] A47G *9/02*

U.S. Cl. 5—636 **18 Claims**

1. A low flammability pillow comprising a cushioning core and a cover separable therefrom, wherein the cushioning core comprises a binder-consolidated nonwoven block from 5 to 15 cm in thickness and from 500 to 3000 g/m^2 in basis weight comprising fibers or filaments having a linear density from 3 to 50 dtex and the cover is a pocket-shaped, closable casing comprising a textile sheet material comprising woven or knitted fabric, the fibers and filaments of the cushioning core and of the casing comprising flame resistant polyester, and wherein the flame resistant polyester contains cocondensed structural units of the formula I



$$-O-\overset{\overset{\displaystyle O}{\uparrow}}{\underset{\underset{\displaystyle R^1}{|}}{P}}-R-\overset{\overset{\displaystyle O}{\|}}{C}- \qquad (I)$$

where R is alkylene or polymethylene of 2 to 6 carbon atoms or phenyl and R^1 is alkyl of 1 to 6 carbon atoms, aryl or aralkyl.

5,586,351

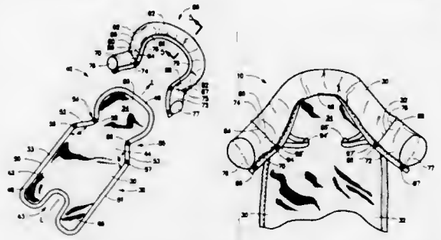
INFANT SUPPORT PAD WITH ADJUSTABLE PILLOW

Ronald A. Ive, 12848 W. Ellsworth Pl., Lakewood, Colo. 80228

Filed Mar. 7, 1995, Ser. No. 399,911

Int. Cl.[6] A47D *15/00;* **A47G** *9/00*

U.S. Cl. 5—655 **21 Claims**



1. A support article adapted to engage an infant's head, neck and shoulders in order to provide lateral stability to the infant's head and neck, comprising:

(a) a pad adapted to be placed against a support, said pad having a first surface upon which said infant can be placed in a reposed position and a second surface opposite said first surface; and

(b) an upstanding support pillow secured to said pad and including a central portion extending in an arcuate configuration around a region that is sized and adapted to receive the infant's head when said infant is in the reposed position and a pair of end portions disposed on opposed ends of said central portion and projecting in laterally outward directions from one another thereby to define shoulder supports that are positionable against the infant's shoulders when the infant's head is received within said region, said end portions adapted to be supported by the infant's shoulders and said end portions and said central portion operative to provide stability to the head and neck of said infant by resisting lateral movement of said infant when said infant is in the reposed position.

15. A support article adapted to engage an infant's head, neck and shoulders in order to provide lateral stability to the infant's head and neck, comprising:

(a) an elongated pad having a longitudinal axis and adapted to be positioned against a support and having a first surface upon which said infant can be placed in a reposed position, said pad including a lower portion having a pair of lateral side edges and an upper portion having an upper peripheral edge extending arcuately around a majority of a circle and terminating at peripheral edge ends located laterally inwardly of said lateral side edges, said side edges respectively connected to the peripheral edge ends of said upper peripheral edge by respective inwardly extending medial edges each formed at an obtuse angle with respect to an associated one of said side edges such that said upper peripheral edge and said medial edges form a pair of opposed V-shaped cut-outs which define a medial portion of said pad between said upper portion and said lower portion with said medial portion being of reduced transverse dimension with respect thereto; and

(b) a raised support pillow disposed on said pad alongside the upper peripheral edge to terminate proximate to said medial portion, said support pillow including a central portion extending in an arcuate configuration around a region that is sized and adapted to receive the infant's head when said infant is in the reposed position and a pair of end portions disposed on opposed ends of said central portion and projecting in laterally outward directions from one another thereby to define shoulder supports that are positionable against the infant's shoulders when the infant's head is received within said region, said end portions adapted to be supported by the infant's shoulders and said end portions and said central portion operative to provide stability to the head and neck of said infant by resisting lateral movement of said infant when said infant is in the reposed position.

5,586,352

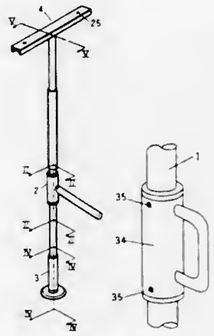
SUPPORT POLE WITH A PIVOTING AND LOCKING HANDRAIL FOR ELDERLY AND DISABLED PERSONS

John L. O'Brien, 1682 Station Boulevard, Ottawa, Ontario, Canada; Edward M. Thomas, 522 Gascon St. P.O. Box 131, Russell, Ontario, Canada, and Donald A. N. Ed, 662 Windermere Ave., Ottawa, Ontario, Canada

Filed May 2, 1994, Ser. No. 236,113

Int. Cl.[6] A61G *12/00;7/053*

U.S. Cl. 5—662 **12 Claims**



1. A support pole for assisting elderly and disabled persons with a pivoting and locking handrail unit comprising a pole member having means at its upper end and at its lower end to support said pole member in a vertical operating position wherein said hand rail unit comprises a cylindrical member having a tubular handrail member radially mounted thereon said handrail member being

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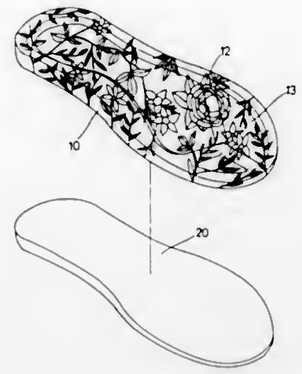
positioned below the upper end of the pole member and above the lower end of the pole member.

5,586,353
PLASTIC FASTENER FOR SHOE-LASTING APPLICATIONS
F. Gerard Merser, Round Pond, Me., assignor to Avery Dennison Corp., Pasadena, Calif.
Continuation of Ser. No. 968,397, Oct. 29, 1992, Pat. No. 5,438,724. This application Apr. 19, 1995, Ser. No. 424,910
Int. Cl.[6] A43D *9/00;5/00;* **B65D** *77/10*
U.S. Cl. 12—142 LC **9 Claims**

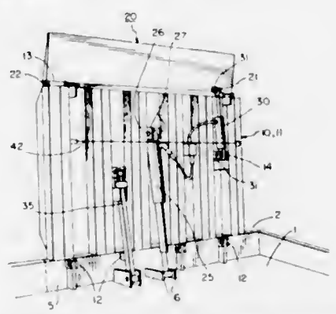
1. A fastener comprising:
(a) an elongated flexible filament having a first end and a second end;
(b) a cross-bar disposed at said first end of said elongated flexible filament, said cross-bar having a pair of ends; and
(c) a paddle disposed at said second end of said elongated flexible filament, said paddle being provided with three alternative openings through any one of which both ends of said cross-bar may be completely inserted to form a rounded loop, wherein said three alternative openings are arranged generally parallel to the longitudinal axis of said elongated flexible filament so that three different sized loops may be formed.

5,586,354
METHOD FOR FORMING PATTERNS ON SHOE SOLE
Kuan-Jen Chi, Da Li, Taiwan, assignor to Kuan M. Chi, Da Li, Taiwan
Filed May 11, 1995, Ser. No. 439,175
Int. Cl.[6] A43D *8/24*
U.S. Cl. 12—146 BR **1 Claim**

1. A method for forming a pattern on a shoe sole comprising:
preparing a material for forming said shoe sole,
preparing a film,
providing a pattern on said film,
attaching said film onto said material so as to engage said pattern with said material,
disengaging said film from said material so as to allow transferring of said pattern onto said material, and
molding said material so as to allow infiltrating of said pattern in said material and so as to form a shoe sole body,
wherein said shoe sole body includes an outer peripheral surface having said pattern provided therein and includes a bottom portion having a cavity formed therein, said shoe sole includes an insert for engaging in said cavity.



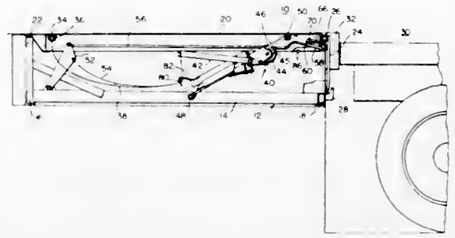
5,586,355
SAFETY DEVICE FOR A VERTICALLY STORED DOCK LEVELER
Donald Metz, Kirkville, N.Y., and James C. Alexander, London, Canada, assignors to United Dominion Industries, Inc., Charlotte, N.C.
Filed Mar. 21, 1995, Ser. No. 408,038
Int. Cl.[6] E01D *15/127*
U.S. Cl. 14—69.5 **11 Claims**



7. A vertically storing dock leveler comprising, a movable deck, a power source to move the deck up into a vertical stored position and to lower said deck into a generally horizontal operative position, and a sensor positioned under the deck and movable therewith to stop downward deck movement when said sensor is tripped.

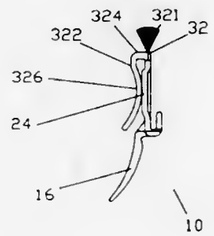
5,586,356
AUTOMATIC RETURN TO DOCK MECHANISM FOR MECHANICAL DOCK LEVELER
James C. Alexander, London, Canada, assignor to United Dominion Industries, Inc., Charlotte, N.C.
Filed Nov. 27, 1995, Ser. No. 563,061
Int. Cl.[6] E01D *1/00*
U.S. Cl. 14—71.1 **6 Claims**

1. A dockboard comprising:
a frame, a deck pivotally mounted to said frame, a lip pivotally mounted to an outboard end of said deck;
said lip having an arm mounted to a lower surface,
a crank mechanism comprising a pivoting arm member mounted to said frame, a pushrod extending under said deck having one end thereof coupled to said pivoting arm member and a slot member attached to the other end of said push rod,
said slot member having a slot engaging a portion of said arm mounted to said lip,



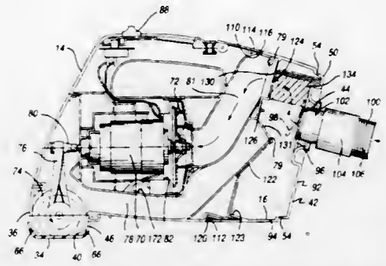
a spring to bias said slot member to urge engagement between said slot and said arm mounted to said lip, and
a hold down mechanism to permit said deck to raise and lower, said hold down mechanism including a linkage to said pivoting arm member, whereby as said lip moves from an extended position to a pendant position, said pushrod is moved in one direction by action of said arm engaged in said slot causing said pivoting arm member to disengage said hold down mechanism allowing said deck to raise and, as said lip continues to fall said arm moves in said slot allowing said push rod to move in a second direction thereby allowing said hold down mechanism to re-engage said deck and return to dock level.

5,586,357
HAND-HELD SCRATCH TICKET SCRAPER
Steven J. Kosakowski, 125 R Baldwinville Rd, Winchendon, Mass. 01475, and Brian A. Chipman, 151 Hosley Rd., Gardner, Mass. 01440
Filed Jul. 10, 1995, Ser. No. 501,419
Int. Cl.[6] A47L *13/022*
U.S. Cl. 15—111 **20 Claims**



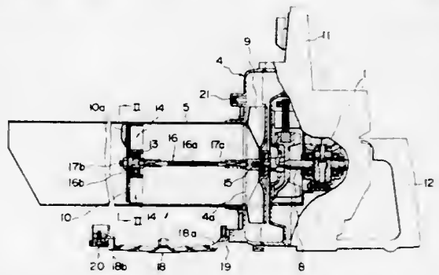
1. A lottery game scratch ticket scraper for use with a lottery game scratch ticket of the type having a planar surface with rows of indicia hidden by a removable covering, said scraper comprising:
a planar main body, said main body having a planar upper side defining a thumb lying area and a lower side defining a forefinger lying area, said main body further having a front end and a rear end;
at least one appendage protruding from said main body, said at least one appendage comprising an arcuate strip of material which lies outside the plane defined by said planar main body, said arcuate strip of material having a crescent-shaped cross-sectional shape for preventing breakage, wherein said at least one appendage has an attached end and a scraping end, said attached end being attached to said front end of said main body and said scraping end for scraping the covering off a lottery game scratch ticket and said scraper further comprising a brush means attached to said rear end of said main body for brushing off game ticket covering scrapings wherein said brush means comprises bristles extending substantially in the same plane as said planar main body.

5,586,358
HAND CARRIABLE VACUUM CLEANER WITH ACCESSORY ATTACHMENT
Jack Wolfe, Discovery Bay, and Roy C. C. Ping, North Point, both of Hong Kong, assignors to Bissell, and TTI
Filed Aug. 15, 1994, Ser. No. 290,429
Int. Cl.[6] A47L *5/32*
U.S. Cl. 15—334 **11 Claims**



1. A hand held vacuum cleaner carriable by a user during use, the vacuum cleaner comprising:
a housing defining a main inlet, an accessory inlet, an exhaust outlet, and a vacuum passageway interconnecting the inlets to the outlet;
a motor supported by the housing;
an impeller located in the vacuum passageway intermediate the main and accessory inlets and the exhaust outlet, the impeller driven by the motor to create a stream of air passing downstream selectively from the main inlet or from the accessory inlet to the exhaust outlet;
a cover sealingly and selectively mountable over either the main inlet or the accessory inlet for selecting a stream of air passing downstream from one of the main inlet or the accessory inlet; and
a hose removably mountable to the accessory inlet.

5,586,359
LEAF VACUUM WITH ROTARY CUTTING BLADE
Giichi Iida, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Jun. 29, 1995, Ser. No. 496,415
Claims priority, application Japan, Jul. 4, 1994, 6-174794
Int. Cl.[6] A47L *7/02*
U.S. Cl. 15—339 **17 Claims**



11. An outdoor vacuum cleaner for picking up and shredding leaves and other debris, the vacuum cleaner comprising:
a housing having an inlet and an outlet;
a suction tube detachably mounted to the housing at the inlet;
a fan located within the housing for creating suction in the suction tube;
a motor for driving the fan;
a rotary blade located in the suction tube;

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a stationary blade mounted in the suction tube between the fan and the rotary blade at a location proximate the rotary blade;

a transmission shaft rotatably secured to the fan and extending from the fan past the stationary blade to the rotary blade, whereby the rotary blade is rotatably secured to the transmission shaft and the transmission shaft is supported on the stationary blade;

wherein fan pieces are provided on the rotary blade such that rotation of the rotary blade creates suction.

5,586,360

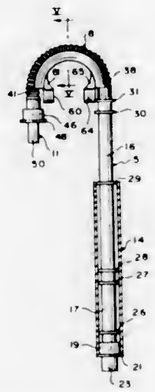
ATTACHMENT FOR PNEUMATIC CLEANING DEVICE

Everett G. Diederiks, Jr., Lake Ridge, Va., and Edwin E. Puett, Jr., Stuart, Fla., assignors to Anser Tool & Machinery Technologies, Inc., Stuart, Fla.

Filed Jul. 5, 1995, Ser. No. 498,053

Int. Cl.[6] A47L *9/02;9/32*

U.S. Cl. 15—410 **19 Claims**



1. An attachment for a pneumatic cleaning device comprising:

an elongated, rigid tubular member having a first end portion and a second end portion, the first end portion of said rigid tubular member being adapted to be attached to a pneumatic cleaning device;

a flexible tubular member having an associated length and including a first end and a second end, the first end of said flexible tubular member being attached to the second end portion of said rigid tubular member;

a rigid, tubular end piece being attached to the second end of said flexible tubular member, said end piece terminating at a portion remote from said flexible tubular member in a nozzle portion; and

a tubular, rigid cover member having an associated length that is longer than the associated length of said flexible tubular member, said cover member defining an associated inner diameter that is greater than an associated outer diameter of each of said rigid tubular member and said flexible tubular member, said cover member being movably mounted between a first position wherein said cover member extends between the second end portion of said rigid tubular member and said end piece and about said flexible tubular member in order to maintain said flexible tubular member in a straight posture and a second position wherein said cover member extends about said rigid tubular member in order to enable said flexible tubular member to assume a curved posture.

5,586,361

DOOR STOP, IN PARTICULAR FOR MOTOR VEHICLE DOORS

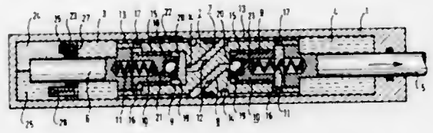
Karl-Heinz Tölle, Wuppertal, and Hermann Grothe, Remscheid, both of Germany, assignors to Ed. Scharwachter GmbH & Co. KG., Remscheid, Germany

Filed Sep. 21, 1995, Ser. No. 531,681

Claims priority, application Germany, Sep. 21, 1994, 44 33 648.9

Int. Cl.[6] E05F *3/04*

U.S. Cl. 16—51 **10 Claims**



1. A door stop for enabling an unhindered movement of a door in a first door opening angular region and for stepless stopping and retaining the door in an arbitrary selected opening position in a second opening angular region, the door stop comprising:

a hydraulic cylinder connectable to one of a door assembly part, a door and a door frame;

a stop piston longitudinally displaceable in said hydraulic cylinder, said piston separating two pressure chambers formed in a cavity of said hydraulic cylinder;

a piston rod fixedly secured to said stop piston for connecting said stop piston with another part of the door assembly;

two separate conduits formed in said stop piston for communicating said two pressure chambers with each other;

two closing pistons respectively located in said two separate conduits and displaceable therein in opposite directions between an open position, in which they permit flow of a pressure medium through said two separate conduits, respectively, from one of the pressure chambers to another of the pressure chambers, and a closing position, in which they block the fluid flow through said two separate conduits, each of said closing pistons being formed of at least two parts and has at least one axial pressure relief bore extending between respective two parts;

spring means for biasing said two closing pistons to the closing positions thereof; and

a by-pass conduit formed in said hydraulic cylinder and by-passing said stop piston for directly communicating said two pressure chambers with each other.

5,586,362

ANTI-RUBBING BLOCK

Neil M. Baker, Barnwood, United Kingdom, assignor to Securistyle Limited, Cheltenham, United Kingdom

Filed Dec. 15, 1994, Ser. No. 357,857

Claims priority, application United Kingdom, Apr. 14, 1994, 9407370

Int. Cl.[6] E05D *13/00*

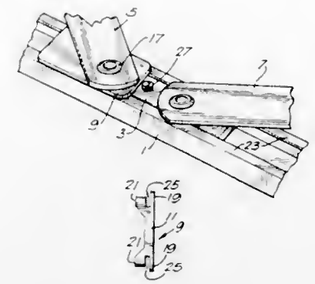
U.S. Cl. 16—193 **31 Claims**

1. An anti-rubbing block for a friction stay, said stay including a track having sidewalls with edges, a slider mounted in the track, and a link connected to the slider and adapted to be connected to a vent arm, said anti-rubbing block comprising:

a body for positioning within the track, said body extending above the track to prevent rubbing of the link on the track;

said body having extending lips for overlying the edges of the side walls of the track; and

said body having a flange extending from the body substantially parallel to the track, during use, for attachment to the slider such that the anti-rubbing block moves with the slider along the track during opening and closing of the stay.



5,586,363

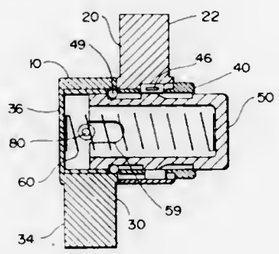
INDEXING HINGE

John M. Fanuzzi, Hwy. 89 Seven Point Ranch, Emigrant, Mont. 59027

Filed Apr. 6, 1995, Ser. No. 417,941

Int. Cl.[6] E05C *17/64;* **E05D** *11/08*

U.S. Cl. 16—342 **13 Claims**



1. An indexing hinge, comprising:

a first sleeve having an interior surface;

a second sleeve, with an interior surface;

a plurality of longitudinal channels formed circumferentially in said interior surface of said second sleeve and extending substantially the length thereof;

a hollow shaft with a first end and a second end with at least one first opening on said first end and a second plurality of openings formed circumferentially along said second end of said shaft;

a lip on said second end of said shaft;

said first end of said shaft inserted thru said second sleeve until said lip engages said second sleeve and second plurality of openings on said shaft are aligned with said channels of said second sleeve;

said first sleeve inserted onto said first end of said shaft so to cover said first opening on said shaft and said shaft is non-rotatablly affixed to said first sleeve;

a plunger with a first end and a second end;

a first circumferential channel formed on the outside of said first end of said plunger with at least one sloped side and a second circumferential channel formed on the outside of said second end of said plunger;

said plunger inserted into said shaft so that said first circumferential channel of said plunger is aligned with said second plurality of openings on said shaft and said second circumferential channel of said plunger is aligned with said first opening on said shaft;

a first detent inserted into said second circumferential channel of said plunger and thru said first opening on said shaft; and

a second detent inserted into each of said second plurality of openings on said shaft.

5,586,364

FASTENING ELEMENT FOR HARDWARE PARTS AND HINGE EMBODYING SUCH ELEMENTS

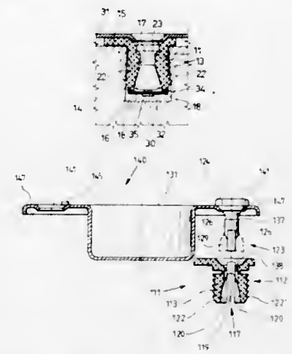
Franco Ferrari, Frazione Deviscio 2, 22053 Lecco, and Carlo Migli, Lecco, both of Italy, assignors to Franco Ferrari, Italy

Filed Apr. 24, 1995, Ser. No. 427,066

Claims priority, application Italy, May 13, 1994, MI940353 U

Int. Cl.[6] E05D *5/00*

U.S. Cl. 16—383 **15 Claims**



1. A fastening element for fastening hardware elements to parts of furniture units, comprising a plug which has therethrough an opening defining an axial housing between opposed side walls of the plug which are expansible, said housing having therein a pin, said pin having opposed side portions thereof extended in a direction crosswise to the axis of said housing and being rotatable between a first position in which the side walls of the plug are not expanded to enable one end thereof to be inserted into a hole in the furniture unit, and a second position in which the plug side walls are expanded by said extended side portions of said pin to enable said plug to be anchored in the hole, and characterized by the fact that the confronting surfaces of the axial housing and of the extended side portions of the pin have reciprocal contacting surfaces in the expanded position which are divergent in the direction of said one end of the plug.

5,586,365

FIBER TUFT FEEDER FOR A FIBER PROCESSING TEXTILE MACHINE

Ferdinand Leifeld, Kempen, and Armin Leder, Mönchengladbach, both of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Sep. 22, 1995, Ser. No. 532,855

Claims priority, application Germany, Sep. 24, 1994, 44 34 251.9

Int. Cl.[6] D01G *15/40;23/02;15/74*

U.S. Cl. 19—105 **20 Claims**

1. A fiber tuft feeder comprising

(a) a first chute having an upper, inlet end and a lower, outlet end;

(b) charging means for introducing fiber tufts into said first chute through said inlet end;

(c) a feed roller supported at said outlet end of said first chute; said feed roller having a rotary axis;

(d) an opening roller adjoining said feed roller and being supported below said feed roller; said opening roller having a rotary axis; said opening roller receiving fiber tufts from said feed roller; an imaginary plane containing said rotary axes dividing said feed roller and said opening roller into first and second sides; said opening roller throwing fiber tufts to said first side;

(e) drive means for rotating said feed roller and said opening roller;

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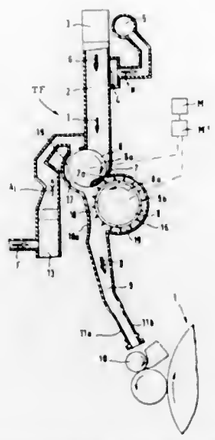


(f) a second chute extending downwardly from said opening roller at said first side of said feed roller and said opening roller; said second chute having an upper, initial portion extending generally tangentially to said opening roller;

(g) densifying air stream generating means for introducing an air stream into said second chute to densify the fiber tufts therein; and

(h) guide means for directing said densifying air stream to flow consecutively along said feed roller and said opening roller on said first side; said guide means including means for directing said densifying air stream circumferentially about a significant part of a surface of said feed roller.

5,586,366

APPARATUS FOR CLEANING AND OPENING FIBER TUFTS

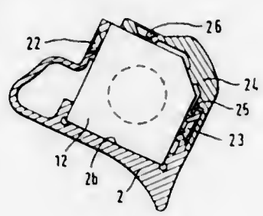
Ferdinand Leifeld, Kempen, and Konrad Temburg, Mönchengladbach, both of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Oct. 4, 1995, Ser. No. 539,056

Claims priority, application Germany, Nov. 5, 1994, 44 39 564.7

Int. Cl.[6] D01G *9/16;9/14;9/12;9/06*

U.S. Cl. 19—105 **19 Claims**



1. A fiber tuft feeding device for a fiber processing machine, comprising

(a) a fiber advancing member having a first fiber-contacting surface;

(b) an extruded, light-metal feed tray having a second fiber-contacting surface defining, with said first fiber-contacting surface, a nip between which the fiber tufts pass in a feed direction; said feed tray having a length extending transversely to the feed direction; said feed tray having an elongated cavity extending parallel to said length;

(c) an elongated element received in said cavity and extending parallel to said length; said elongated element being resistant to bending; and

(d) support means for positioning said feed tray adjacent said fiber advancing member.

5,586,367

HOOK CLOSURE FOR BOOT

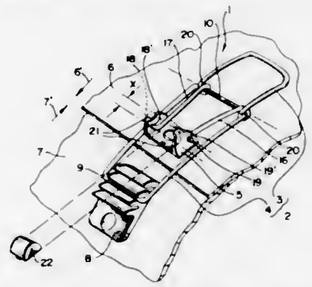
Louis Benoit, La Balme de Sillingy, France, assignor to Salomon S.A., Metz-Tessy, France

Filed Oct. 30, 1995, Ser. No. 550,301

Claims priority, application France, Nov. 2, 1994, 94 13343

Int. Cl.[6] A43C *11/00*

U.S. Cl. 24—68 SK **11 Claims**



1. Hook closure for a boot having a shell comprising on one side, a control assembly provided with an elastic means for returning to the position pressed against the shell of the boot, which assembly is constituted by a plurality of elements of which a lever-puller, a hooking buckle, and a base, connected between them by journals, and on the other side a hooking element adapted to cooperate with the buckle, at least one of the elements being obtained from a metallic wire in the form of an open buckle whose ends of the arms are curved to assure the linkage by journalling with the other elements on which it is mounted, wherein the elastic return means is integrated with one of the elements made in the form of an open buckle, which, obtained in a flexible metallic wire, has two arms of which at least one of the curved ends is offset by a value "X" and is fixed in a corresponding hole offset by the same value "X" and obtained on the other element, thus assuring the linkage by journalling between the two elements and the elastic return function thereof.

5,586,368

LOCKING ATTACHMENT

Richard L. Nelson, R.R. #3, Box 50 H, Pelican Rapids, Minn. 56572

Filed May 8, 1995, Ser. No. 436,527

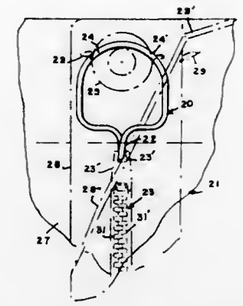
Int. Cl.[6] A44B *19/00*

U.S. Cl. 24—390 **1 Claim**

1. A zipper lock attachment for a pair of jeans wherein the jean have a pair of front panels with a zipper mounted across the inner edges of the front panels for opening and closing the front panels, and wherein a button is mounted to one of the panels above the zipper with the other of the front panels having a button opening for buttoning said other of said panels to said one panel,

comprising a one piece ring like resilient rod formed into a ring like shape and having its remote ends overlapping one another in parallel relation for a portion of the length of the rod with the ends spring urged together along an upper portion of its ring like shape,

said ring like rod having a downwardly bent loop portion along the bottom of its ring like shape bent downward into a relatively small loop with relatively small inner radius in



relation to the ring like rod's inner radius and with the small loop formed about an axis perpendicular to the axis of the ring like rod,

wherein said ring like rod have its upper overlapping ends manually urged apart sufficiently to insert their ends into an eyelet of a zipper handle of the zipper, and when said zipper has been zipped upward to close the zipper opening, the upper overlapping ends of the ring like rod be slipped over the button of the jeans to secure the zipper in its upper closed position on the panels of the jeans with the zipper handle resting in the small loop of the rod.

5,586,369

DOUBLE-LAYER SLIDE FASTENER TAPE

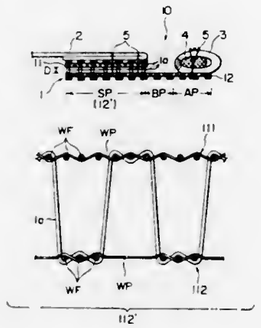
Yoshio Matsuda; Shunji Akashi, and Hiroshi Yoshida, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 520,857

Claims priority, application Japan, Aug. 31, 1994, 6-206208

Int. Cl.[6] A44B *19/00*

U.S. Cl. 24—392 **4 Claims**



1. A slide fastener tape woven or knitted so as to form a coupling element attaching edge portion, a tape body portion and a tape sewing portion arranged in order transversely of said tape,

wherein said tape has a double-layer structure portion composed of a front cloth and a back cloth joined together by a connecting yarn with a predetermined gap therebetween extending transversely over a predetermined region of said tape, said connecting yarn being a synthetic resin monofilament or multifilament, said back cloth of the double-layer structure portion being a section formed of at least a mesh woven or knitted fabric.

5,586,370

SEPARABLE BOTTOM STOP ASSEMBLY FOR SLIDE FASTENER

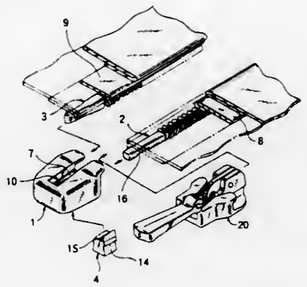
Tsutomu Fudaki, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Jul. 21, 1995, Ser. No. 505,758

Claims priority, application Japan, Jul. 29, 1994, 6-178747

Int. Cl.[6] A44B *19/38*

U.S. Cl. 24—433 **8 Claims**



1. A separable bottom stop assembly for a slide fastener, comprising:

(a) a box having on one side thereof a stopper-insertion hole communicating with a box-pin-insertion hole;

(b) a box pin adapted to be mounted to a lower end of one fastener stringer of a pair of fastener stringers of the slide fastener and inserted in said box-pin-insertion hole;

(c) a separable pin adapted to be mounted on a lower end of a second fastener stringer of the pair of fastener stringers of the slide fastener; and

(d) a stopper from said box and said box pin inserted in said stopper-insertion hole to press said box pin against a partition of said box in such a manner that said box, said box pin and said stopper are fixedly joined together.

5,586,371

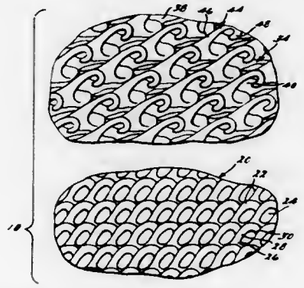
METHOD FOR MANUFACTURING REFASTENABLE FASTENING SYSTEMS INCLUDING A FEMALE LOOP FASTENING COMPONENT AND THE PRODUCT PRODUCED THEREFROM

Dennis A. Thomas, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 8, 1994, Ser. No. 336,277

Int. Cl.[6] A44B *18/00*

U.S. Cl. 24—452 **9 Claims**



1. A fastening system, comprising:

a male component including a plurality of extending hooks;

a female component including a substrate comprising a sheet of flexible material and a multiplicity of female formed loop

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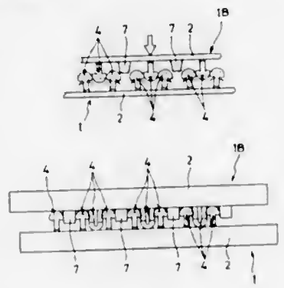
members deposited onto and joined to said substrate, each of said loop members including:

(a) a base comprising the plane of attachment of said member to said substrate such that said member is joined at said base to said substrate;

(b) a shank having a proximal end and a distal end, said proximal end being contiguous with said base, said shank projecting longitudinally outwardly from said base and said substrate, said distal end fusing with another loop member thereby providing an opening through which at least one of said hooks may project upon fastenably contacting the male and female components.

5,586,372
FASTENING DEVICE
Tomoo Eguchi, Utsunomiya, and Goro Asami, Machida, both of Japan, assignors to Nifco Inc., Yokohama, Japan
Filed Mar. 4, 1996, Ser. No. 610,337
Claims priority, application Japan, Apr. 5, 1995, 7-103190
Int. Cl.[6] A44B *18/00*
U.S. Cl. 24—452 **8 Claims**



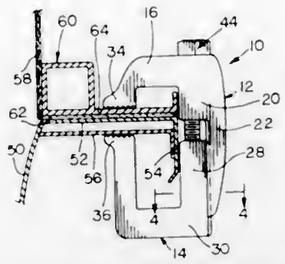
1. A fastening device comprising,

two fastening members, each having a flat base portion and a plurality of engaging projections fixed on the base portion, said engaging projections extending from one side of the base portion and being arranged laterally and vertically, each engaging projection having at least one leg fixed to the base portion at one side and an engaging head portion fixed to the other side of the leg, said engaging head portion having a lateral size greater than that of the leg, and

non-engaging projections integrally formed on at least one of the fastening members, each non-engaging projection having a height less than the engaging projection so that in case the two fastening members are engaged, when one engaging projection projecting toward one non-engaging projection is pushed laterally by another engaging projection situated adjacent to said one non-engaging projection, an engaging head portion of said one engaging projection is pushed toward said one non-engaging projection and then is returned to an original portion by said one non-engaging projection to thereby engage engaging head portions of said one and another engaging projections.

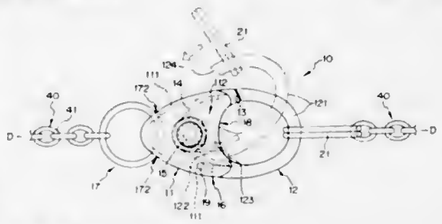
5,586,373
CLAMP
Devon Eby, Nappanee; Dale Love, Goshen, and James L. Reed, Nappanee, all of Ind., assignors to Grrreat Creations, Inc., Nappanee, Ind.
Filed Sep. 6, 1995, Ser. No. 524,263
Int. Cl.[6] A44B *21/00;* **F16B** *7/00*
U.S. Cl. 24—525 **7 Claims**

1. A clamp comprising a pair of relatively movable clamping members made of a material other than metal, a pair of clamping



pods, each of said members including a pair of arms, one arm of each member carrying one of the clamping pods such that the clamping pod of one member opposes the clamping pod of the other member, the other arm of said one member being stepped to define a larger cross-section portion and a smaller cross-section portion with a shoulder therebetween, said smaller portion extending from said larger cross-section portion, the other arm of said other member slidably engaging the smaller portion of the other arm of said one member, said one arm of said one member extending from said larger portion, a bore extending through said larger portion substantially parallel to said smaller portion, and adjustable fastening means extending through said bore and then parallel to said smaller portion thereby interconnecting said other arm of said other member and said other arm of said one member for moving the members relative to one another whereby adjustment of the fastening means moves the clamping pods toward and away from one another.

5,586,374
CLASP MECHANISM
Shoichi Nishida, No. 3-2, Nishi-Ichinoe, 4-Chome, Edogawa-Ku, Tokyo, Japan
Filed Dec. 14, 1994, Ser. No. 356,919
Int. Cl.[6] A45F *5/02;* **F16B** *45/02;* **A44B** *13/02*
U.S. Cl. 24—599.8 **10 Claims**



10. A clasp, comprising:

a) a main body;

b) a hook;

c) said main body having opposed sides defining a cavity therebetween, said body including a web disposed between said opposed sides, said web including a pair of eyelets for receiving a ring;

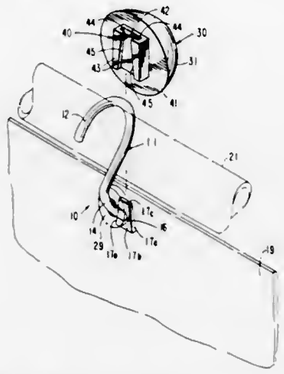
d) said hook including an arc-shaped portion for securing to an article, said arc-shaped portion including a free end;

e) said hook including a base portion adapted to be disposed within said cavity and pivotably secured to said opposed sides for movement between closed and open positions, said base portion including opposed side walls;

f) a mating end secured to said main body and extending therefrom, said mating end being adapted to engage said free end of said arc-shaped portion when in the closed position; and

g) a spring operably disposed within said main body cavity and between said base portion opposed side walls for biasing said arc-shaped portion in the closed position.

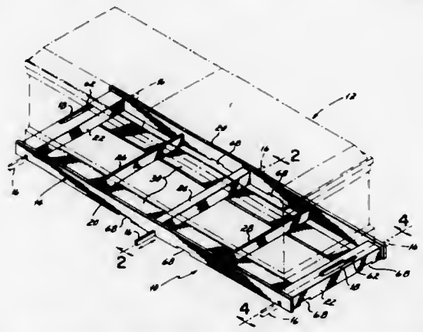
5,586,375
TWO-PIECE SHOWER CURTAIN HOOK
Barbara Cooperman, New York, N.Y., and Robert M. Huff, Clark, N.J., assignors to Springs Industries, Inc., Fort Mill, S.C.
Filed Sep. 30, 1994, Ser. No. 316,189
Int. Cl.[6] A44B *17/00*
U.S. Cl. 24—716 **7 Claims**



1. A shower curtain hook, including:

a hook including a body for permitting the shower curtain hook to hang from a shower curtain rod, a tail for supporting a shower curtain thereon, and a positioning plate supported on said tail, said tail being constructed to support a shower curtain positionable intermediate said positioning plate and said hook; and a decorative cover having a mounting means, said mounting means being adapted to receive said positioning plate so that said decorative cover may be releasably secured to said positioning plate.

5,586,376
DECORATIVE CASKET CARRYING AND PRESENTATION TRAY
John R. Enneking, and John Schultz, both of Batesville, Ind., assignors to Batesville Casket Company, Batesville, Ind.
Filed Oct. 24, 1994, Ser. No. 327,579
Int. Cl.[6] A61G *17/00*
U.S. Cl. 27—27 **22 Claims**

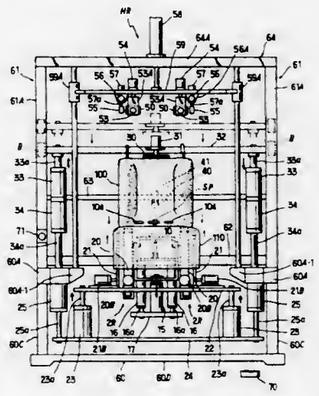


1. A decorative casket carrying and presentation tray comprising:

a generally rectangular casket support adapted to bear and display a casket thereon; and

pallbearer handles mounted on either side of said support movable laterally into and out of said support to and between an exposed, operable position wherein said handles are graspable by a pallbearer and a concealed, inoperable position wherein the laterally outboard ends of said handles are flush with said support and said handles are hidden from view.

5,586,377
SYSTEM FOR COVERING A CUSHION MEMBER WITH A TRIM COVER ASSEMBLY
Kazuo Katsuta, and Tadafumi Abe, both Akishima, Japan, assignors to Tachi-S Co., Ltd, Tokyo, Japan
Filed Nov. 30, 1994, Ser. No. 351,103
Int. Cl.[6] B68G *7/00*
U.S. Cl. 29—91.5 **12 Claims**



1. A system for covering a cushion member with a trim cover assembly, in which the trim cover assembly is formed in a sack-like configuration having a top section, a first side section, a second side section facing said first side section, an interior surface, an exterior surface and a pair of lateral sections, said trim cover assembly further having an anchor device on an inside surface of said second side section, the cushion member being formed from a foam material having an upper wall, lower wall and four side walls and further including an anchoring point, to which said anchor device is to be secured, said system comprising:

a first movable securing and support means for temporarily securing and supporting thereon said upper wall of said cushion member and said top section of said trim cover assembly at a predetermined position, wherein said interior surface of said trim cover assembly is turned outwardly thereby rendering said interior surface outwardly facing when secured on said first movable securing and support means;

a second movable securing and support means for temporarily securing and supporting thereon said lower wall of said cushion member;

a first drive means for causing said first movable securing and support means and said second movable securing and support means to be moved in a first direction;

a covering guide means for supporting and guiding said trim cover assembly and turning said outwardly facing interior surface inwardly onto said four side walls of said cushion member, said covering guide means being arranged so as to surround said first movable securing and support means:

said covering guide means comprising;

a first guide element for pressing and guiding said first side section of said trim cover assembly alongside of said first movable securing and support means;

a second guide element for pressing and guiding said second side section of said trim cover assembly alongside of said first movable securing and support means; and

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a pair of third guide elements, each pressing and guiding a respective lateral section of said pair of lateral sections of said trim cover assembly;

a pressing means for applying a pressure to a part of said cushion member corresponding to said anchoring point, thereby rendering said part of said cushion member thin, to make said anchoring point accessible;

a second drive means for moving said covering guide means in a second direction opposite to said first direction; and

a switch means operable to start and stop said first drive means and said second drive means and to activate said pressing means;

wherein said covering guide means and said first movable securing and support means and said second movable securing and support means may be moved toward each other through said first drive means and said second drive means by operation of said switch means so as to cause said first side section, said second side section and said paired lateral sections of said outwardly facing interior surface to be turned inwardly by said first guide element, said second guide element and said pair of third guide elements onto said four side walls of said cushion member, and said pressing means may be activated by operation of said switch means to make said anchoring point of said cushion member and permitting said anchor means of said trim cover assembly to be manually secured to said anchoring point, wherein said cushion member is precisely and neatly covered with the trim cover assembly with said anchor means being secured to said anchoring point.

5,586,378

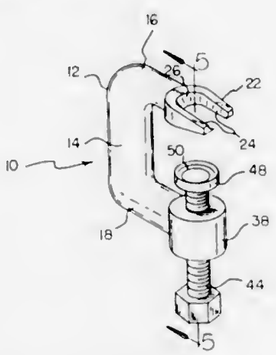
BALL JOINT EXTRACTOR

Steven D. Smith, 1115 Ward St., Centralia, Wash. 98531-5047

Filed Jul. 18, 1994, Ser. No. 276,838

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—257 **1 Claim**



1. A ball joint clamp comprising:

a C-shaped clamp having an elongated vertical component at its central extent and having two horizontal parallel legs comprised of an upper leg and a lower leg extending from opposing ends thereof;

a fixed jaw in a U-shaped configuration having parallel legs in a horizontal orientation and a curved coupling section therebetween, the coupling section secured at its interior end to the outboard end of the upper leg, the U-shaped jaw having a horizontal lower surface and an upper surface angling downwardly from its curved coupling section with the interior surface of the U-shaped jaw being chamfered whereby the upper surface of the U-shaped jaw has a smaller surface area on its upper surface than its lower surface with the coupling section being a curve having an axis parallel with the axis of the long leg of the U-shaped member;

a cylindrical member with a threaded central aperture and an exterior surface secured at one edge to the exterior surface of the lower leg of the C-shaped clamp with the axis of the cylindrical member being co-extensive with the axis of the U-shaped member and parallel with the axis of the long leg of the C-shaped member; and

a bolt having a thread exterior surface rotatably coupled to the threads of the cylindrical member, the upper end of the threaded bolt being formed with an enlarged disk having a spherical recess facing the U-shaped member and having a head at its lower end rotatable at the discretion of the user, the disk being shaped to contact the free end of a ball joint pin and push it through its supporting aperture;

a handle component having a lower end and an upper end and a leg component with an outboard end and a threaded exterior end adapted to be threadably coupled to the central portion of the elongated vertical component on the side thereof remote from its legs but parallel therewith, the outboard end of the leg component being formed with an aperture positionable to be co-axial with an aperture at the upper end of the handle component, a toothed interface between the upper end of the handle component and the outboard end of the leg component and a bolt with a wing nut adapted to be positioned through the apertures of the handle and leg component for effecting a secure coupling therebetween at a predetermined angle.

5,586,379

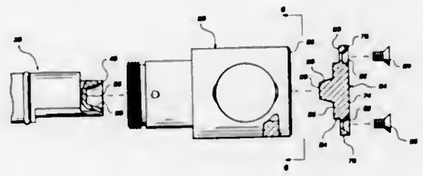
STABILIZING OF CAM IN AUTOMATED BEVERAGE FILLING MACHINERY

Terry E. Nish, Salt Lake City, Utah, assignor to Servi-Tech, Inc., Salt Lake City, Utah

Division of Ser. No. 168,692, Dec. 16, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,376

Int. Cl.[6] B23P *6/00; 11/00*

U.S. Cl. 29—401.1 **9 Claims**



1. A method for modifying an automatic beverage filling machine to insure accurate filling of successive containers comprising the steps of:

(a) providing a cam comprising a cantilevered end forming part of a cam assembly for a fill valve of the automatic beverage filling machine;

(b) fabricating one bearing segment at the cantilevered end of the cam;

(c) fabricating a second matching bearing segment as a separate piece;

(d) placing the two bearing segments into mating contiguous rotatable relation within a cam housing of the cam assembly;

(e) non-rotatably securing the second bearing segment to the cam housing so as to retain the mating contiguous rotatable relationship between the two bearing segments.

5,586,380

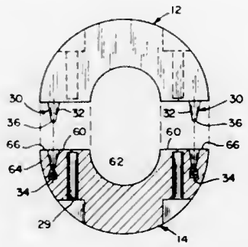
METHOD FOR MAKING MATED MOLDED PARTS ASSEMBLY

Dennis S. Shimmell, Hudsonville, Mich., assignor to Nelson Metal Products Corporation, Grandville, Mich.

Division of Ser. No. 994,272, Dec. 21, 1992, Pat. No. 5,387,472, which is a continuation-in-part of Ser. No. 886,694, May 20, 1992, Pat. No. 5,313,703. This application Oct. 18, 1994, Ser. No. 324,797

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—413 **5 Claims**



1. A method for making an assembly of mated parts comprising the steps of:

forming a first part with a mating surface and at least one protrusion extending from the mating surface, said protrusion formed with a head joined to said mating surface by a narrowed neck portion;

subsequent to the forming of said first part, forming a second part in place with said first part such that the material of said second part envelops said protrusion, captures said head, and mated precisely with the mating surface of said first part; and

forcibly separating said first and second parts until said narrowed neck portion of said protrusion breaks.

5,586,381

METHOD FOR THE PRODUCTION OF A DEVICE FOR THE TRANSMISSION OF A SIGNAL BETWEEN TWO END POINTS

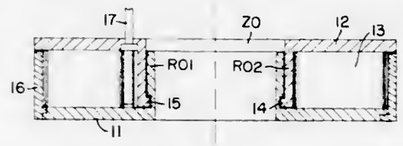
Friedrich Schauer, Heroldsberg, and Andreas Neuner, Nürnberg, both of Germany, assignors to kabelmetal electro GmbH, Hanover, Germany

Continuation of Ser. No. 223,779, Apr. 6, 1994, abandoned. This application Nov. 24, 1995, Ser. No. 562,551

Claims priority, application Germany, May 4, 1993, 43 14 648.1

Int. Cl.[6] B23P *11/00*

U.S. Cl. 29—434 **7 Claims**



1. A method for making a device comprising a substantially circular cassette for transmitting a signal between two end points at least one of which is movable relative to the other, wherein the device is adapted to hold a wound cable which forms a coil between the two end points, wherein extending lines are connected to the cable at the two end points, and wherein the cassette comprises two parts, a first of said parts being a stator, and a second of said parts being a rotor which rotates around an axis and around the stator, the method comprising the steps of:

injection molding said first cassette part using a first mold, said first cassette part comprising a first annular disk with a first cylindrical tube extending concentrically from said firs disk;

providing a second mold comprising said first cassette part, and a further mold part extending into said first tube of said first cassette part;

injection molding said second cassette part using said second mold, said second cassette part comprising a second annular disk with a second cylindrical tube extending concentrically from said second disk, said second tube, while in said second mold, being disposed between said further mold part and said first tube; and

cooling said second tube to obtain a shrinking of said second tube away from said first tube to produce a gap between said first and said second tubes, said gap allowing said cassette parts to rotate relative to each other around a common axis of said two cassette parts.

5,586,382

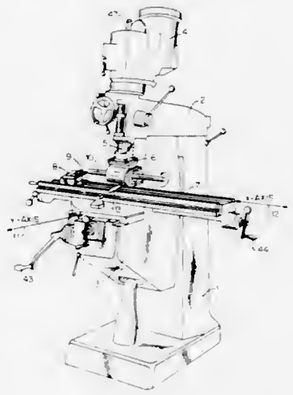
RIGHT ANGLE TURNING ATTACHMENT FOR MILLING MACHINE

Charles F. Ganem, 1 Key Way P.O. Box 154, Cape Neddick, Me. 03902

Filed Apr. 5, 1995, Ser. No. 417,517

Int. Cl.[6] B23Q *37/00;* **B23C** *9/00*

U.S. Cl. 29—560 **6 Claims**



1. A right angle drive, for converting a milling machine to a lathe, comprising:

a housing having a bore therein and a clamping means for releasably attaching said right angle drive to a milling machine;

a drive shaft having at least one bearing mounted in the housing, the drive shaft being connectable to a milling machine spindle;

a through hole spindle having at least one bearing mounted in the housing, the through hold spindle extending at a right angle to the drive shaft;

a drive mechanism connecting the drive shaft to the through hole spindle for driving the through hole spindle; and

a device for holding material in the through hole spindle and for clamping and unclamping material as desired.

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5,586,383

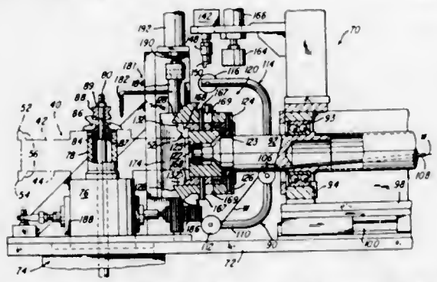
STATOR WINDING METHOD

Patrick A. Dolgas, Clermont County; Ballard E. Walton, Bethel Township, Miami County, and Larry E. Staton, Clark County, all of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

Division of Ser. No. 17,111, Feb. 12, 1993, Pat. No. 5,394,046, which is a continuation-in-part of Ser. No. 950,262, Sep. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 948,399, Sep. 21, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 394,718

Int. Cl.[6] H02K *15/08*

U.S. Cl. 29—596 **13 Claims**



1. A method for winding a stator core for a permanent magnet motor, said stator core having a circular first end face and a circular second end face, said end faces having outer margins spaced by and adjoined to a cylindrical outer wall having a center axis,

a first set of axially-outwardly projecting coil-retaining members in mutually-spaced relation on the outer margin of said first end face,

a second set of axially-outwardly projecting coil-retaining members on the outer margin of said second end face, individual ones of said coil-retaining members of said second set being aligned with individual ones of said coil-retaining members of said first set, said coil-retaining members of said first set each having outer extremities projecting beyond said first end face, said coil-retaining members of said second set each having outer extremities projecting beyond said second end face, said method comprising the steps of:

winding coils of wire around individual pairs of said first set of said coil-retaining members and individual pairs of said second set of coil-retaining members aligned with said individual pairs of said first set of coil-retaining members, said coils having sides extending along said outer wall, a first end extending over said first end face, a second end extending over said second end face, and corners joining said first and second ends, said corners formed around the aligned pairs of said first and second coil-retaining members; and

while winding said coils, guiding the wires forming said ends so that the respective ends of said coils do not project beyond said end faces as far as the outer extremities of said coil-retaining members.

5,586,384

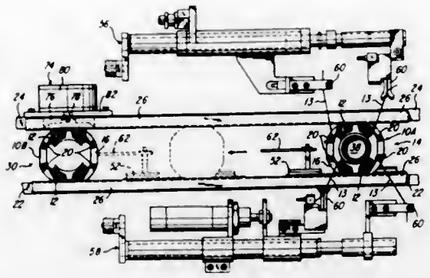
STATOR MANUFACTURING METHOD AND APPARATUS

Lawrence E. Newman, Tipp City, Ohio, assignor to Globe Products Inc., Huber Heights, Ohio

Filed Apr. 28, 1995, Ser. No. 430,738

Int. Cl.[6] H02K *15/085*

U.S. Cl. 29—596 **8 Claims**



1. Stator manufacturing apparatus for winding stator coils on a stator core at a winding station, temporarily clamping the coil lead wires leading to and from the coils by temporary wire clamps, and for removing the stator coil lead wires from the temporary wire clamps at a coil lead terminating station, said apparatus comprising:

a stator support track that supports a stator being wound at the winding station, that extends from the winding station to the coil lead terminating station, and that supports a stator at the coil lead terminating station while lead wire terminations are being made;

a stator transfer assembly comprising a main carriage that shuttles between the stator winding station and the coil lead terminating station, a stator bore-engaging pin mounted on said carriage that moves a wound stator supported by said support track from said stator winding station and said coil lead terminating station, and temporary wire clamps mounted on said carriage; and

a stator clamp assembly at said coil lead terminating station that clamps a wound stator against said support track when a wound stator is located at said coil lead terminating station, thereby permitting said transfer assembly to be shuttled back to the winding station before all of the lead wires are terminated at the coil lead terminating station.

5,586,385

METHOD OF MANUFACTURING A THIN FILM MAGNETIC HEAD

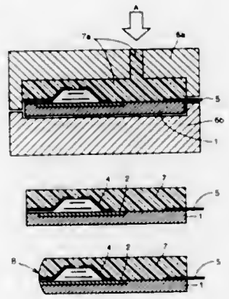
Hiromi Nishino, Kitakatsuragi-gun, and Akiyoshi Fujii, Ikoma-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 213,917, Mar. 15, 1994, abandoned. This application Feb. 13, 1996, Ser. No. 599,858

Claims priority, application Japan, Mar. 16, 1993, 5-055970; Dec. 27, 1993, 5-332864

Int. Cl.[6] G11B *5/127*; **B29C** *45/14*

U.S. Cl. 29—603.16 **10 Claims**



1. A method of manufacturing a thin film magnetic head, said head including, on a resin substrate thereof, an element portion for reading a magnetic signal, and a wiring connection portion connected to a terminal wiring for taking out an electric signal from the element portion, said method comprising the steps of:

forming said element portion on the resin substrate;

connecting said terminal wiring to said wiring connection portion;

inserting said resin substrate and said terminal wiring into a mold;

injecting resin material into said mold to form a resin cover of said magnetic head and to form a tape guide of said magnetic head, said resin cover and said tape guide being formed of the same resin material and integrally with each other; and

shaping an end of said resin substrate in the vicinity of said element portion to form a magnetic recording medium sliding surface.

5,586,386

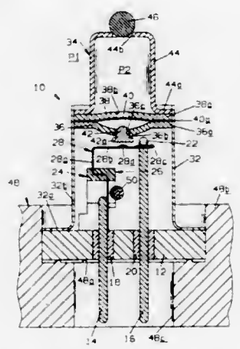
SENSOR FOR USE WITH AIR BAG INFLATOR AND METHOD FOR MAKING

Daniel Morin, North Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 323,955, Oct. 17, 1994, Pat. No. 5,504,288. This application Nov. 16, 1995, Ser. No. 559,217

Int. Cl.[6] H01H *35/34*

U.S. Cl. 29—622 **4 Claims**



1. A method for making a monitoring system for a vehicular inflator air bag system in which a first gas mixture for use in inflating an air bag is stored in a container at a prescribed pressure at a selected temperature, the first gas mixture selected from any two amounts of the group of gases consisting of argon, nitrogen and helium and having a pressure vs temperature curve with a given slope comprising the steps of forming a reference gas chamber, taking a snap acting disc having opposed first and second face surfaces, mounting the snap acting disc so that the first face surface is exposed to the first gas mixture and the second face surface is exposed to gas in the reference gas chamber, filling the reference gas chamber with a second gas mixture at a selected pressure lower than the pressure of the first gas mixture at the selected temperature, said second gas mixture selected from the group of gases for the first gas mixture and including at least one additional gas and having a pressure vs temperature curve with a slope steeper than the slope of the pressure vs temperature curve of the first gas mixture and choosing a sufficient quantity of the additional gas so that the slope of the pressure vs temperature curve of the first and second gas mixtures are essentially the same.

5,586,387

AUTOMATED PART ASSEMBLY MACHINE

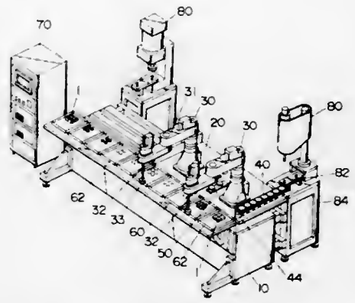
Takuya Nakatani, Hirakata; Mitsutaka Abe, Yahata; Shigeru Dono, Osaka, and Youji Urano, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 21, 1994, Ser. No. 360,568

Claims priority, application Japan, Dec. 22, 1993, 5-325460; Sep. 27, 1994, 6-231867

Int. Cl.[6] B23P *21/00*

U.S. Cl. 29—703 **23 Claims**



1. An automated parts assembling machine comprising:

a work table supported to a base and movable relative thereto;

at least two separate robots each having an end effector movable around within an individual work region, said at least two separate robots positioned in such a relation as to give a common work region in which individual work regions of said at least two separate robots overlap;

parts supply means arranged adjacent to said work table for storing parts to be picked-up by said at least two separate robots;

a plurality of operator hands selectively and removably attached to at least one of said end effector of said at least two separate robots for handling parts;

jig means disposed within said common region in order to position said parts for assembly by said at least two separate robots;

control means for controlling operations of said at least two separate robots and moving said work table;

wherein said at least two separate robots are mounted on said movable work table together with said operator hands and said jig means, said at least two separate robots spaced in a moving direction of said work table, and wherein said parts supply means extends in the moving direction of said work table.

5,586,388

METHOD FOR PRODUCING MULTI-BOARD ELECTRONIC DEVICE

Yasunobu Hirao, Toyokawa; Yuji Motoyama, Okazaki; Takashi Nagasaka, Anjo, and Hidekazu Katsuyama, Nukata-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 118,785, Sep. 10, 1993, Pat. No. 5,408,383, which is a continuation of Ser. No. 889,701, May 29, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 400,243

Claims priority, application Japan, May 31, 1991, 3-157672

Int. Cl.[6] H05K *3/36*

U.S. Cl. 29—830 **13 Claims**

1. A method for producing an electronic device having circuit boards which mount electronic circuits thereon and which are arranged in a multi-board structure within a casing, said method comprising the steps of:

preparing a frame forming said casing;

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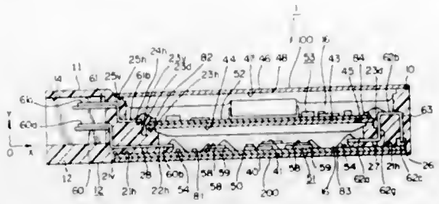


engaging a first plate on which a first circuit is mounted with said frame to form a plate of said frame;

arranging a second plate on which a second circuit is mounted inside said frame at an intermediate position of said frame and with an interposing space between said first plate and said second plate;

injecting a coating agent into said interposing space between said hrst and second plates through an injection aperture provided on a side surface of said frame and at a position between said first plate and said second plate, so as to completely cover said first circuit with said coating agent;

injecting said coating agent over a surface of said second plate through an aperture provided in said frame, so as to completely cover said second circuit with said coating agent; and

simultaneously curing said coating agent covering both said first and second circuits, when said coating agent has completely covered said first and second circuits.

5,586,389

METHOD FOR PRODUCING MULTI-BOARD ELECTRONIC DEVICE

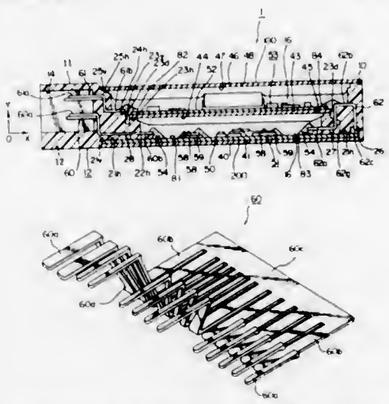
Yasunobu Hirao, Toyokawa; Makoto Koyama, Kariya, and Yuji Motoyama, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 118,785, Sep. 10, 1993, Pat. No. 5,408,383, which is a continuation of Ser. No. 889,701, May 29, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 400,242

Claims priority, application Japan, May 31, 1991, 3-157674

Int. Cl.[6] H05K *3/30;* **H01R** *43/24;* **H05K** *3/36*

U.S. Cl. 29—841 **11 Claims**



1. A method for producing an electronic device casing, said casing including a resin frame for arranging at least two circuit boards in a mutually parallel relationship to each other and at least one connecting metallic lead disposed inside a side wall of said frame, said connecting metallic lead including an intermediate portion, a first contacting portion for electrically connecting with a first circuit board, and a second contacting portion for electrically connecting with a second circuit board, said method comprising the steps of:

arranging said connecting metallic lead as an insert in a cavity of a mold for molding said frame;

pressing said intermediate portion of said connecting metallic lead with an extended portion of a supporting plate which extends through a groove in said mold toward said cavity so as to press said first and second contacting portions of said connecting metallic lead against a surface of said cavity and to fix said connecting metallic lead in said cavity; and

molding said frame while pressing said connecting metallic lead against said mold cavity surface with said extended portion of said supporting plate so as to fix said connecting metallic lead in said cavity.

5,586,390

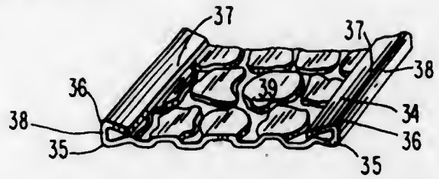
METHOD OF MAKING JEWELRY ARTICLES

Josef J. Barr, 777 W. Flagler Dr., West Palm Beach, Fla. 33402

Filed Jul. 3, 1995, Ser. No. 498,033

Int. Cl.[6] A44C *25/00;5/00;* **B21F** *43/00*

U.S. Cl. 29—896.411 **2 Claims**



1. The method of forming a generally planar article of jewelry which comprises the steps of:

a) providing a planar sheet of precious metal of thickness ranging from 0.008 to 0.020 inch;

b) using a corresponding male and female die set, stamping a portion of said sheet to form an article of overall rectangular configuration including a design in relief, and, including additional peripheral material along the longitudinal and end edges thereof;

c) bending said additional peripheral material through substantially 180 degrees to form a peripheral re-enforcing liner to increase the effective thickness of said article at the periphery thereof.

5,586,391

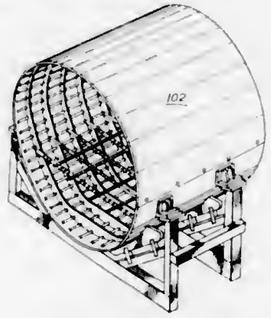
METHOD OF MAKING AIRPLANE FUSELAGE

Antonio C. Micale, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 964,533, Oct. 13, 1992, Pat. No. 5,560,102. This application Jun. 6, 1995, Ser. No. 468,217

Int. Cl.[6] B23Q *17/00*

U.S. Cl. 29—897.2 **3 Claims**



1. A method of making an airplane fuselage section from a plurality of individual subassemblies including panels, frame members and a floor grid, comprising:

drilling coordination holes in the marginal regions of said panels said panels each including longitudinal stiffening stringers, stringer clips, and shear ties fastened thereto;

aligning said coordination holes in adjacent edges of a plurality of panels;

fastening said panels together temporarily with temporary fasteners through said aligned coordination holes;

clamping said panels together along said adjacent edges;

drilling holes in said adjacent edges of said panels with a single drill plunge for each hole during said clamping of said panels;

riveting said panels together along said adjacent edges through the drilled holes during said clamping of said panels to produce a superpanel;

drilling a coordination hole in each of said stringer clips of said superpanel and corresponding coordination holes in said frame members;

orienting said frame members on station planes adjacent corresponding stringer clips;

aligning said coordination holes in said stringer clips with said corresponding coordination holes in said frame members;

fastening said frame members to said stringer clips temporarily with temporary fasteners through their aligned coordination holes;

clamping said frame members to said stringer clips and to said shear ties fastened to said superpanel and extending between said stiffening stringers along said station planes;

drilling holes in said frame members and their corresponding stringer clips with a single drill plunge for each hole during said clamping of said frame members;

riveting said frame members and their corresponding stringer clips together through the drilled holes during said clamping of said frame members;

drilling holes in said frame members and corresponding shear ties with a single drill plunge for each hole during said clamping of said frame members;

riveting said frame members and their corresponding shear ties together through the drilled holes during said clamping of said frame members;

drilling a coordination hole adjacent each end of a plurality of cross members of said floor grid, and corresponding coordination holes in said frame members at each location therealong at which it is desired to connect said floor grid to said frame members;

orienting said floor grid adjacent said frame members and aligning said coordination holes in said cross members of said floor grid with said corresponding coordination holes in said frame members;

fastening said cross members to said frame members temporarily with temporary fasteners through their aligned coordination holes;

clamping said floor grid cross members to said frame members;

drilling holes in said cross members and said frame members with a single drill plunge for each hole during said clamping of said cross members;

fastening said cross members and said frame members together through the drilled holes during said clamping of said cross members to form a fuselage lower lobe;

drilling coordination holes along two longitudinally extending edges of said fuselage lower lobe, and along two corresponding longitudinally extending edges on a fuselage upper lobe;

orienting said fuselage upper lobe over said fuselage lower lobe and aligning said coordination holes along said longitudinally extending edges of said fuselage upper lobe with said corresponding coordination holes along said longitudinally extending edges of said fuselage lower lobe;

sealing and temporarily fastening said upper lobe and said lower lobe with temporary fasteners along said longitudinally extending edges through their aligned coordination holes;

clamping said fuselage upper and lower lobes together along said longitudinally extending edges;

drilling holes in said fuselage upper and lower lobes with a single drill plunge for each hole along said longitudinally extending edges during said clamping of said fuselage upper and lower lobes; and

fastening said fuselage upper and lower lobes together through the drilled holes along said longitudinally extending edges to form a fuselage section;

wherein said drilling of said coordination holes in said panels, in said stringer clips, in said shear ties, in said frame members, in said cross members of said floor grid, and in said fuselage lower and upper lobe is done using an end effector carried by a precision computer controlled robot that is directed to the drilling locations using a digital data set taken directly from digital engineering part definition records, said drilling locations being determined with respect to reference points on each drilled component, so the spatial relationships between key features of said subassemblies as defined by said coordination holes make said subassemblies self-locating and intrinsically determinate of the final contour and configuration of said fuselage section, independent of tooling.

5,586,392

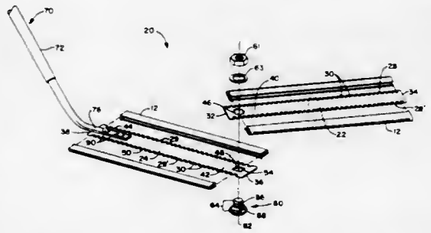
SWING STROKE GARDENING TOOL

Michael J. Pasquale, 45 Spring St., Middletown, Conn. 06457

Filed May 18, 1995, Ser. No. 444,091

Int. Cl.[6] B26B *27/00*

U.S. Cl. 30—318 **13 Claims**



1. A gardening tool comprising a handle and a cutting head fixedly secured to the handle, said cutting head comprising a pair of elongated blade members and an adjustable interconnection therebetween for connecting the blade members end to end, said interconnection permitting selective angular positioning of said first and second blade members relative to each other and secured fastening thereof in said selected position, said interconnection comprises a bolt having a locking shank portion and a threaded portion, and a nut threadably mountable on said threaded portion, said locking shank portion being immobilized against rotation relative to one of said blade members, the other of said blade members having an aperture for receiving and cooperating with the shank portion for positioning said other blade member relative to said shank to fix the selected angular positions of said blade members.

5,586,393

HEADLAMP LEVEL INDICATOR

Douglas E. Pherigo, Loves Park, and Leo B. Jansen, Rockford, both of Ill., assignors to Textron Inc., Providence, R.I.

Filed Dec. 20, 1994, Ser. No. 359,399

Int. Cl.[6] G01C *9/10;* **B60Q** *1/00*

U.S. Cl. 33—288 **5 Claims**

1. A headlamp alignment indicator assembly for indicating and calibrating a vehicle headlamp orientation comprising:

an adjustable, beam-directing structure for a headlamp;

a roller element arranged for rolling movement along a guide structure arranged to guide said rolling movement, said guide

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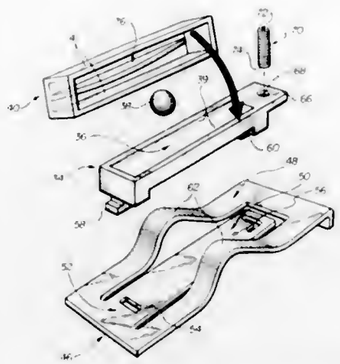


structure being disposed with exclusion of dampening liquid therefrom in order to eliminate handling and disposal hazards of said liquid;

said guide means being coupling said beam-directing structure for movement therewith; and

indicator means for indicating displacement of said roller element resulting from said rolling movement relative to said guide means and further comprising at least one cushioning structure positioned to form an end of said guide track in order to absorb impact of said roller member thereagainst.

5,586,394

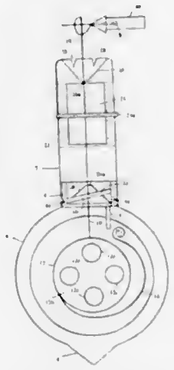
SELF-CONTAINED PLUMB BOB AND INK LINE MARKER WITH LINE CAPABLE OF AUTOMATIC BRAKING AND RETRACTION

Mick Courtney, 311 W. Main St., Enterprise, Oreg. 97828

Filed Jun. 2, 1995, Ser. No. 460,535

Int. Cl.[6] G01C *15/10;* **B44D** *3/38*

U.S. Cl. 33—394 **4 Claims**



1. An assembly for a self contained, combination plumb bob and ink line marker capable of braking and retraction comprising:

a hollow housing, comprising a threadedly and separably engaged cylindrical neck portion, a substantially flat and round disc shaped portion with a tapered point on the circumferential edge, and a connector sleeve joining one open end of the cylindrical neck portion with the circumferential edge of the disc portion opposite the tapered point on the disc shaped portion of the housing giving the assembled invention a pendulum shape;

a line reel mounted inside the disc portion of the housing;

a strong flexible member attached at one end and wound about the line reel, extending through the cylindrical neck portion of the invention housing, to which the disc portion of the housing is attached, and out the open end of the cylindrical neck portion of the housing opposite the disc shaped portion of the housing;

an ink reservoir formed by two apertured partitions in the cylindrical neck portion of the invention housing;

absorbent member inside the ink reservoir for storing and applying ink to the flexible member as it passes over the absorbent member;

an access door in the external surface of the cylindrical portion of the invention housing allowing access to the ink reservoir and absorbent member for replenishing the ink and means for securing the door in a closed position;

a reel stop and means for halting rotation of the line reel and extension or retraction of the attached flexible member;

a hub extending from one side surface of the line reel through an aperture in the disc shaped portion of the apparatus housing for effecting manual rotation of the line reel;

a series of gears or teeth on the side surface of the line reel opposite the external reel hub;

a spring spool associated with the line reel by gears or teeth on one side surface of the spring spool which interlock with the gears or teeth on the side surface of the line reel allowing the line reel and spring spool to rotate together simultaneously and means for turning the spring spool independently of the line reel;

a coiled band spring attached at one end to the spring spool and at the other end to the internal surface of the disc portion of the apparatus and means for adjusting the tension of the spring.

5,586,395

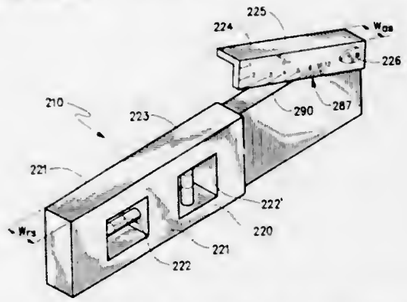
LEVEL ANGLE GAUGE

Jerry P. Malczewski, Evergreen, Colo., assignor to Malczewski Holdings, Inc., Evergreen, Colo.

Filed Sep. 30, 1994, Ser. No. 316,557

Int. Cl.[6] B43L *7/10*

U.S. Cl. 33—471 **22 Claims**



1. A level angle gauge adapted for use to capture an angular measurement of a structural surface relative to an imaginary plane so that the captured angular measurement can be transferred onto a workpiece when said level angle gauge is positioned thereon, said level angle gauge comprising:

(a) an elongated body structure having a pair of oppositely disposed sides extending in a longitudinal direction and a reference surface extending therebetween, said reference surface having a reference surface width that is oriented transversely to said longitudinal direction;

(b) a leveling element connected to said body structure and operative to indicate that said reference surface of said body structure is oriented parallel to the imaginary plane when the angular measurement is being made;

(c) an arm structure having an arm surface and being pivotally connected to said body structure, said arm structure movable between a first position wherein said arm surface is oriented in a common plane with said reference surface of said body structure and a second position wherein said arm surface is oriented at an angle relative to said reference surface, said arm surface having an arm surface width that is less than said reference surface width; and

(d) an arm lock mechanism operative in an unlocked state to permit said arm structure to pivot between the first position and the second position and in a locked state to releasably retain said arm structure in one of the first position and the second position whereby when in the second position with said reference surface being oriented parallel to the imaginary plane and with said arm surface being disposed in registration with the structural surface, said arm structure and said body structure can be locked together to capture the angular measurement so that the captured angular measurement can be transferred onto the workpiece when said level angle gauge is positioned thereon, said arm lock mechanism being dimensioned to have a length in a direction transverse to said body structure which length is less than the reference surface width.

5,586,396

DRYING APPARATUS HAVING ROTATING VANE ASSEMBLIES AND DRYING METHOD USING THE SAME

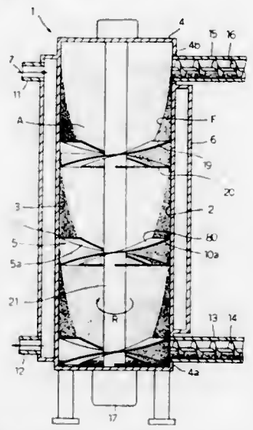
Masao Kanai, 18-10 Nagatasannoudai, Minami-ku, Yokohama-shi, Japan

Filed Aug. 8, 1995, Ser. No. 512,375

Claims priority, application Japan, Aug. 10, 1994, 6-209246; Sep. 1, 1994, 6-232096; Oct. 13, 1994, 6-013805 U

Int. Cl.[6] F26B *17/30*

U.S. Cl. 34—59 **9 Claims**



1. A drying apparatus comprising:

a cylindrical drying vessel for receiving material to be dried, an inner wall surface of said cylindrical drying vessel defining a heat-transmitting surface,

heat-generating means encircling the cylindrical drying vessel to transmit heat to the heat-transmitting surface of the cylindrical drying vessel, and

at least one rotating vane assembly rotatably fixed in the cylindrical drying vessel,

the rotating vane assembly having a plurality of vane sections, which extend from a common central portion and leave between circumferential edges thereof and the heat-transmitting surface of the cylindrical drying vessel, annular spaces wide enough to allow the material to cross and contact the heat-transmitting surface without falling therein,

each vane section extending obliquely upward in a direction which is opposite to a rotating direction thereof, and the circumferential edge of each vane section extending less than 360 degrees as viewed from above,

whereby all vane sections when rotating bear material on upper surfaces thereof to raise the material upward and push the material against the heat-transmitting surface under the influence of centrifugal force thus causing the material to continuously climb along the heat-transmitting surface, thereby drying the material.

5,586,397

DRYER SECTIONS OF A PAPER MACHINE

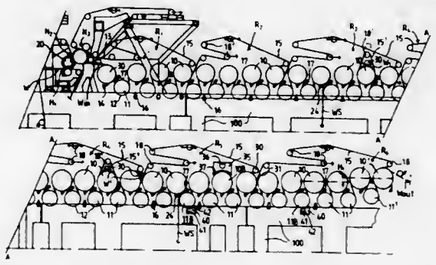
Reima Kerttula, and Jouko Yli-Kauppila, both of Munrame, Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Apr. 18, 1994, Ser. No. 229,471

Claims priority, application Finland, Nov. 30, 1993, 935340

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—114 **35 Claims**



8. Dryer section in a paper machine, comprising

a plurality of only normal dryer groups having a single-wire draw, each of said dryer groups comprising contact-drying cylinders arranged in a first row, reversing suction cylinders arranged in a second row spaced from said first row of contact-drying cylinders and a drying wire for supporting a paper web, the paper web being passed in a closed draw between adjacent ones of said dryer groups and running over an outer circumference of said reversing suction cylinders while being subjected to negative pressure, the web running over a sector of at least one of said contact-drying cylinders in one of said dryer groups and having an exposed first face and a second, opposed face of the web in direct contact with an outer surface of said at least one of said contact-drying cylinders in said sector, and

drying means for applying a drying impulse to the exposed first face of the web as the web runs over said sector of said at least one contact-drying cylinder such that the drying profile of the web in the direction of thickness of the web is equalized and the drying capacity of the dryer section is increased.

5,586,398

ARTICLE OF FOOTWEAR FOR MORE EFFICIENT RUNNING

J. Martin Carlson, 6005 Kellogg Ave., Edina, Minn. 55424-1830

Continuation of Ser. No. 183,360, Jan. 19, 1994, abandoned. This application Oct. 13, 1995, Ser. No. 542,682

Int. Cl.[6] A43B *5/00*

U.S. Cl. 36—114 **10 Claims**

1. An article of footwear having an anterior end portion and a postero-lateral portion comprising:

a sole structure having a postero-lateral initial contact portion and an medial/forefoot portion;

the initial contact portion having a substantially planar lower surface joining the medial/forefoot portion along a junction line, and the initial contact portion having a thickness tapering from the junction line to a postero-lateral edge of the sole

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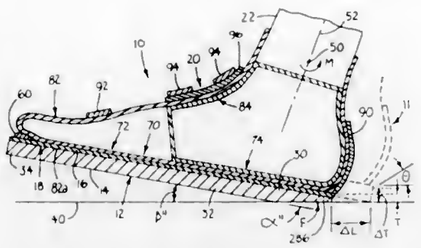
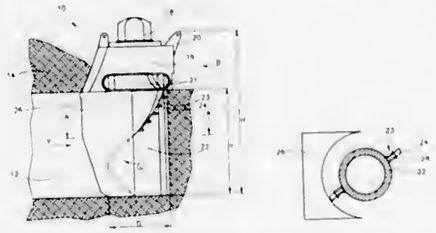


structure to provide a minimum thickness of material interposed between a foot of the wearer and the ground engaging surface; and

an insole having an insole initial contact portion and an insole medial/forefoot portion, the insole initial contact portion overlying the initial contact portion of the sole structure and being formed of material having a surface of a selected coefficient of friction for controlling slippage, and the insole medial/forefoot portion having a higher coefficient of friction which is higher than the selected coefficient of friction in the initial contact portion of the insole, to permit initial sliding between the foot and the insole in the insole initial contact portion on impact of the foot with the support surface, and the insole medial/forefoot portion reducing sliding of the forefoot relative to the insole.

5,586,399
VERTICAL TRENCHER APPARATUS EMPLOYING CUTTER HAVING HELICAL CHANNEL OF VARYING RISE ANGLE
Semeon Staroselsky, Tel Aviv, Israel, assignor to V.T.S. Trenching Systems Ltd., Yavne, Israel
Filed Aug. 22, 1995, Ser. No. 517,697
Int. Cl.[6] E02F *3/06*
U.S. Cl. 37—351 **4 Claims**



1. A vertical trencher apparatus attachable to a moving platform carrying a power source for excavating rock and soil to form a trench, the apparatus comprising:

(a) a cutter body having:

(i) a substantially cylindrical surface having a lower end, an upper end and defined as having a longitudinal central axis,

(ii) a ridge attached to, and extending outwardly from, said surface in a helical configuration extending continuously along said surface to said lower end, said ridge having an upper surface and an outer edge, said ridge being formed such that a rise angle at a point of said ridge proximal to said lower end of said surface is less than a rise angle at a point of said ridge proximal to said upper end of said surface, wherein said rise angle is defined at each point of said ridge as the angle between a virtual plane parallel to said upper surface at that point and a virtual plane perpendicular to said longitudinal axis, and

(iii) a plurality of cutting elements deployed in fixed relation to said outer edge such that said cutting elements lie substantially on a virtual cylinder;

(b) a housing operatively engaged with said cutter body at said upper end so as to maintain said cutter body with said longitudinal central axis substantially vertical and to allow rotation of said cutter body about said longitudinal central axis, said housing having a lateral aperture;

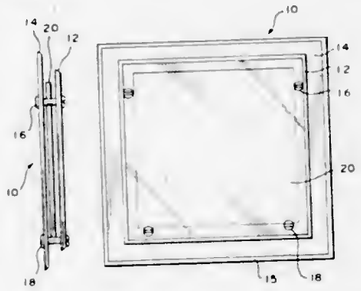
(c) a power transmission associated with said cutter body at said upper end for employing power from the power source to generate rotation of said cutter body about said longitudinal central axis; and

(d) a back cover mounted in fixed relation to said housing so as present an inner surface extending substantially along and partially circumscribing said cutter body.

5,586,400
FABRIC HOLDER WITH COMPLIMENTARY CLAMPING SURFACES AND METHOD
E. Frank Moore, III, 4447 Old Randleman Rd., Greensboro, N.C. 27406
Continuation of Ser. No. 254,071, Jun. 3, 1994, abandoned. This application Jul. 7, 1995, Ser. No. 499,231
Int. Cl.[6] D06C *3/08;* **D05B** *39/00*
U.S. Cl. 38—102.2 **10 Claims**

1. A means for securing a flexible planar member in a taut manner for subsequent sewing operations on a sewing machine comprising: a base and a clamp, said base comprising a vertical male mating projection, said vertical projection having a single convex section and a single concave section on opposite sides of said vertical projection, said clamp having an outer surface, said clamp outer surface defining a complementary female mating receptacle, said complementary female mating receptacle for rotatingly tightening around said convex section and said concave section wherein said complementary female mating receptacle fully encloses said male mating projection to sandwich said flexible planar member therebetween.

5,586,401
ART WORK DISPLAY APPARATUS
Gary T. Sheehan, 7 Frazer Ave., Malvern, Pa. 19355, and Paul G. Landry, 9 N. Cedar Hollow Rd., Paoli, Pa. 19301
Filed Oct. 31, 1994, Ser. No. 331,806
Int. Cl.[6] G09F *1/12*
U.S. Cl. 40—737 **5 Claims**



1. Apparatus for displaying an article, said apparatus comprising:

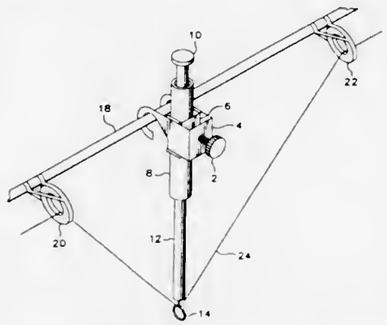
a front cover plate of transparent material;

a rear cover plate of at least the same size as the front cover plate; upper fastening means for fastening said front cover plate to said rear cover plate, said upper fastening means comprising at lease two fasteners spaced apart on a horizontal line, said fasteners having inner surfaces facing the central portion of said cover plates along said horizontal line;

lower fastening means for fastening said front cover plate to said rear cover plate, said lower fastening means comprising at least two fasteners, said lower fasteners having an upper surface facing the top edges of said cover plates, and spaced apart on a horizontal line a distance less than the horizontal distance between said upper fasteners and being positioned to provide vertical support for the article between the front and rear cover plates, the length of said upper and lower fastening means being adjustable according to the thickness of the article; and

support means attached to the rear surface of the rear cover plate by said upper fasteners.

5,586,402
FISHING ROD BITE INDICATOR
S. Shannon Brent, and Craig W. Forbes, both of 1050 Sunnyview Rd. NE., Salem, Oreg. 97303
Filed Feb. 27, 1995, Ser. No. 395,490
Int. Cl.[6] A01K *97/12*
U.S. Cl. 43—17 **5 Claims**



1. A fish bite indicator for use on a fishing rod comprising the combination of:

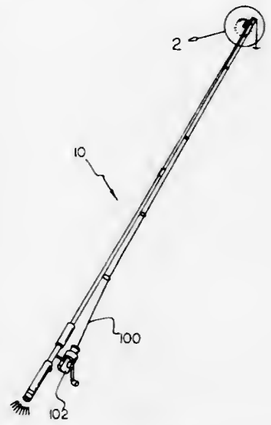
(a) a clamping member comprised of two rigid, parallel arms containing generally hook-shaped openings at the opposite end of an integral perpendicular member having a generally centered threaded hole with a set screw thereby providing the means of attachment of the visual indicator assembly to the fishing rod,

(b) a rigid, channel-shaped member having aligning flanges on the upper and lower edges of the parallel arms which loosely fits inside the parallel arms of the clamping member,

(c) a rigid, tubular member positioned snugly inside the parallel arms of the channel-shaped member,

(d) a rigid, elongated tubular member of approximately twice the length and possessing an exterior dimension slightly less than the interior dimension of the tubular member into which it is inserted; having at its lowermost end a spiral line guide providing the means to encompass fishing line and at its uppermost end a perpendicular projection forming a cap of a size wherein its outermost dimension is slightly larger than the interior dimension of the tubular member providing the means to limit the travel of the elongated tubular assembly within the tubular member and forming, as an assembly, a line-tension-responsive indicating means being operable to produce a visual indication when the action of a fish produces enough line tension to raise the elongated member assembly inside the tubular member when said member is attached in a perpendicular, vertical position on the fishing rod.

5,586,403
ILLUMINATED FISHING ROD
Maurice Ward, RR #6, Orillia, Ontario, Canada
Filed Nov. 3, 1995, Ser. No. 552,717
Int. Cl.[6] A01K *75/02*
U.S. Cl. 43—17.5 **3 Claims**



2. An illuminated fishing rod comprising:

an elongated fishing rod having a plurality of eyelets arranged in a linear relationship along a length thereof, the open lower end of the elongated fishing rod having a pair of copper contacts therein, the fishing rod having copper wire extending from the copper contacts at the open lower end thereof to the upper end portion for electrical coupling with the light portion, the copper wire being wrapped around the fishing pole;

a flashlight portion received within an open lower end of the elongated fishing rod, the flashlight portion comprises of a lower housing having an upper and portion and an open lower end, the upper end portion having a pair of copper contacts therein, the upper end portion dimensioned to be received within the open lower end of the elongated fishing rod with copper contacts thereof in cooperation with contacts within the fishing rod, the lower housing having a pair of batteries therein, the open lower end having a lamp portion removably coupled thereto to facilitate the removal of batteries, the lamp portion contacting a lowermost of the pair of batteries for activation thereof, the lower housing having an on/off switch electrically coupled with the pair of batteries for activation or deactivation of the lamp portion, the on/off switch having copper wiring extending therefrom to couple with the pair of copper contacts of the upper end portion; and

a light portion electrically coupled to an upper end portion of the elongated fishing rod.

5,586,404
FISHPOLE STORAGE SYSTEM
Michael J. Freitas, 1921 Bowers Ave., Santa Clara, Calif. 95051
Filed Mar. 20, 1995, Ser. No. 406,678
Int. Cl.[6] A01K *97/06;97/10*
U.S. Cl. 43—21.2 **7 Claims**

1. A device for storing and carrying a fish pole wherein said fish pole has two sections that are detachably joinable end to end, said device comprising:

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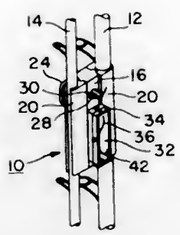


an elongated central member having a substantially rectangular cross section;

a pair of elongated tongues, one of said tongues on one side of said central member opposite another side of said central member having the other of said tongues;

a pair of pole catches, each pole catch being elongated with an elongated groove on one side dimensioned to mate with one of said tongues and an elongated groove on another side adapted to detachably engage a fish pole section; and

means for detachably attaching said central member to a wall.

5,586,405

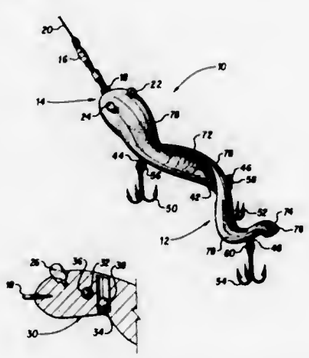
FISHING LURE

Jody R. Fike, 831 Jackson Ave., Monaca, Pa. 15061

Continuation-in-part of Ser. No. 221,800, Apr. 1, 1994, abandoned. This application Dec. 21, 1994, Ser. No. 360,617

Int. Cl.[6] A01K *85/00*

U.S. Cl. 43—42.31 **3 Claims**



1. A fishing lure for use in top water surface fishing, comprising:

a head having means for securing a swivel device thereto;

a tail end;

a rigid buoyant body extending along an axis joining said head and said tail end, said body having a cross section including a concave recess, said body twisting around said axis such that said concave recess forms a longitudinal spiral for allowing said lure to rotate when pulled along the water surface, said body tapering from said head to said tail end, said body including two perpendicular rattle chambers, each rattle chamber having a loose object therein; and

securing means disposed along said body for attaching hooks to said body.

5,586,406

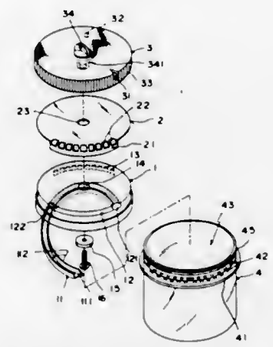
LIVE BAIT CONTAINER

Yong F. Lin, No. 827, Twu Chen Rd., and Yong C. Lin, No. 853, Twu Chen Rd., both of Tali City, Taichung Hsien, Taiwan

Filed Nov. 28, 1995, Ser. No. 563,339

Int. Cl.[6] A01K *97/04*

U.S. Cl. 43—55 **5 Claims**



1. A live bait container comprising:

a container body for keeping live baits, the container body comprising an outer thread around the periphery at one end, a downward bottom flange around the periphery at an opposite end, and an inner thread around said downward bottom flange;

a cover covered on said container body to close said bait chamber, said cover comprising an inner thread threaded onto the outer thread of said container body, a bait outlet and a bait inlet spaced on the periphery, a bait passage way connected between said bait outlet and said bait inlet at an outer side, a plurality of raised portions raised from the inside opposite to said bait passage way, and a spiral track spirally extending downwards from said bait outlet for guiding live baits from said bait chamber to said bait passage way;

a locating board mounted on said cover, said locating board comprising a peripheral flange covered over said bait passage way, and a plurality of holes through said peripheral flange; and

a rotary cap covered on said locating board, having an inside recess forced into engagement with one raised portion of said cover, and a through hole through the periphery, said rotary cap being turned relative to said locating board between the operative position in which the through hole of said rotary cap is disposed in alignment with one through hole on said locating board for permitting a fishhook to be inserted into said bait passage way to pick up live baits from said bait passage way, and the non-operative position in which the through hole of said rotary cap is closed by the periphery of said locating board to prevent escape of live baits.

5,586,407

SWATTER AND METHOD OF USING THE SAME

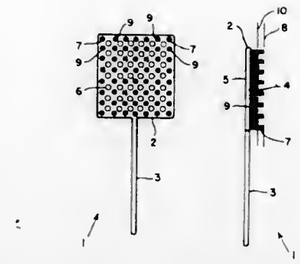
Anthony E. Raymond, 5342 W. Bar S St., Tucson, Ariz. 85713

Filed May 8, 1995, Ser. No. 436,734

Int. Cl.[6] A01M *3/02*

U.S. Cl. 43—137 **8 Claims**

1. A swattar, comprising a support having a cross section, a pair of opposed substantially flat major surfaces, and perforations arranged in plurality of rows and columns; a first set of impaling elements on said support for impaling insects, said impaling elements of said first set being substantially uniformly distributed throughout said cross section, and neighboring impaling elements of said first set being spaced from one another by distances sufficiently large to prevent substantial squashing of an insect were



the insect to be impaled by more than one impaling element of said first set; a second set of impaling elements on said support for impaling insects, said impaling elements of said second set being shorter than said impaling elements of said first set and being substantially uniformly distributed throughout said cross section, and neighboring impaling elements of said second set being spaced from one another by distances sufficiently large to prevent substantial squashing of an insect were the insect to be impaled by more than one impaling element of said second set; and a handle extending from said support.

5,586,408

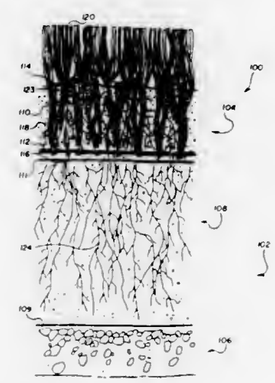
SURFACE FOR SPORTS AND OTHER USES

Jerry G. Bergevin, Lynnwood, Wash., assignor to Turf Systems International, Inc., Lynnwood, Wash.

Continuation of Ser. No. 78,624, Jun. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 902,147, Jun. 22, 1992, abandoned. This application Nov. 4, 1994, Ser. No. 334,414

Int. Cl.[6] A01G *1/00;* **A01H** *5/00*

U.S. Cl. 47—1.01 **18 Claims**



1. A grass playing surface comprising:

(a) a foundation;

(b) an artificial grass turf located on top of the foundation, the artificial grass turf having generally vertically upright fibers mounted in a porous backing material;

(c) a layer of growth medium disposed in the artificial grass turf to a depth sufficient to substantially fill the artificial grass turf to the top of the fibers, the top of the fibers terminating at approximately the top of the layer of growth medium; and

(d) natural grass plants having grass blades, crowns and roots, the grass plants disposed in the growth medium, the roots extending downwardly through the growth medium, the artificial grass turf, and into the foundation, the crowns being located slightly below the top of the artificial fibers and the grass blades extending upwardly above the top of the fibers forming a playing surface of substantially natural grass.

17. A method for forming a durable, natural grass playing surface, comprising the steps of:

(a) providing a panel of artificial turf having generally vertically upright fibers attached to a porous backing material;

(b) placing a layer of growth medium throughout the fibers to a depth sufficient to fill the artificial turf to approximately a top of the fibers;

(c) stabilizing the layer of growth medium with a binding material;

(d) strewing a layer of grass seed over the top of the layer of growth medium;

(e) dispersing a shallow layer of growth medium over the top of the layer of grass seed to fill the artificial turf to at least the top of the fibers;

(f) stabilizing the shallow layer of growth medium with a binding agent; and

(g) placing a plurality of panels formed in accordance with steps (a)–(f) adjacent one another on a foundation and watering the panels to produce a natural grass playing surface.

5,586,409

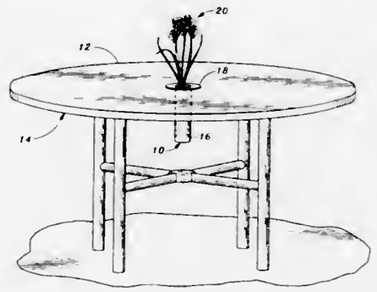
SAFETY VASES FOR UMBRELLA TABLES

Bruce W. Jamieson, 1361 Divine La., Tracy, Calif. 95376

Filed Nov. 14, 1994, Ser. No. 339,020

Int. Cl.[6] A01G *5/00;* **A47G** *7/00*

U.S. Cl. 47—41.01 **5 Claims**



1. A safety vase for use in combination with an umbrella table the top of which is provided with an aperture for receiving an umbrella pole, comprising:

a water-tight receptacle portion having an outer wall which is symmetrical about a longitudinal axis, has an open end and a closed end, the maximum dimension of said receptacle portion transverse to said axis being less than the diameter of said aperture in said table top; and

flange means extending outwardly from said outer wall of said receptacle portion, the diameter of the smallest cylinder coaxial with said longitudinal axis which is capable of containing the entirety of said flange means being greater than the diameter of said aperture in said table top, whereby a part of said receptacle portion adjacent said flange means is maintained in said aperture in said table top when at least a part of the lower face of said flange means bears against the upper face of said table top.

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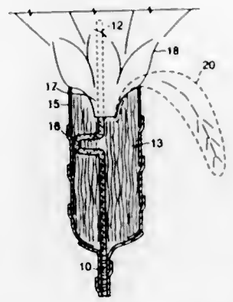
5,586,410
FRESH FLOWER HOLDER
Joseph S. Gallo, 58 Peach St., Walpole, Mass. 02081
Filed Jan. 4, 1996, Ser. No. 583,216
Int. Cl.[6] A01G *5/00*
U.S. Cl. 47—55 **17 Claims**



1. A holder for at least one element of living corsage material from which substantially the entire stem has been severed, the holder comprising

a covered wire;

a plug of absorbent material surrounding an intermediate portion of the covered wire to form a moisture reservoir, the plug having upper and lower surfaces through which the covered wire passes and sides extending from the upper to the lower surfaces; and

a water-repellent covering surrounding the sides and lower surface of the plug and extending down the wire, and leaving the upper surface of the plug uncovered;

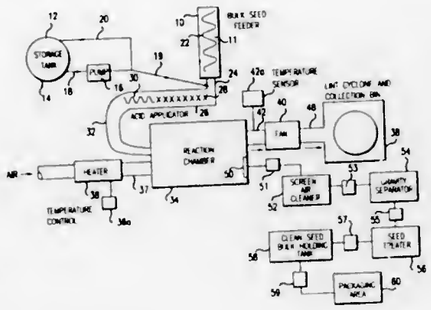
the plug of absorbent material comprising random fibers of synthetic material organized generally uniformly in density throughout the plug and extending predominantly parallel to the covered wire, the fibers being capable of spreading generally radially outwardly to permit insertion of the severed end of the living material into the plug and being capable of providing a radially-inward restoring tendency to keep the material from breaking its moisture-supplying contact with the plug,

the wire having a laterally-extending formation at the intermediate portion, the formation extending laterally from the wire into the fibers of the plug to secure the plug to the wire.

5,586,411
METHOD OF PREPARING A SEED TREATMENT COMPOSITION
Sanford C. Gleddie; Mary E. Leggett, both of Saskatoon; Wendell A. Rice, and Perry E. Olsen, both of Beaverlodge, all of Canada, assignors to Her Majesty the Queen in Right of Canada, and Philom Bios Inc., both of Saskatchewan, Canada
Division of Ser. No. 174,335, Dec. 29, 1993, Pat. No. 5,484,464. This application May 30, 1995, Ser. No. 453,257
Int. Cl.[6] A01C *1/06;* **C12R** *1/80;1/41*
U.S. Cl. 47—57.6 **4 Claims**

1. A method of preparing a composition for co-inoculating legume seeds, comprising packaging a carrier substrate in a container, sterilizing the substrate, adding a suspension of spores of *P. bilaii*, adding a suspension of Rhizobium sp. cells, and mixing said suspensions with said carrier to form a composition.

5,586,412
METHOD FOR RECOVERY OF COTTON SEED FROM LINT
James B. Wadlington, Greenville, Miss., assignor to Delta and Pine Land Company, Scott, Miss.
Continuation of Ser. No. 309,487, Sep. 22, 1994. This application Jun. 6, 1995, Ser. No. 470,134
Int. Cl.[6] A01C *1/00*
U.S. Cl. 47—58 **8 Claims**



1. A batch method for removing lint from fuzzy cotton seed which is to be used for planting purposes comprising:

selecting a batch quantity of fuzzy cotton seed which is to be delinted;

forming a first feed stream of a dilute acid solution;

forming a second feed stream of fuzzy cotton seed from said batch quantity from which lint is to be removed;

merging the flows of said first and second feed streams at an inlet end of an extended flow path to form a composite stream at said inlet end containing said dilute acid first feed stream and said fuzzy cotton seed second feed stream;

gently mixing said composite stream from said inlet end along said extended flow path to gradually blend said first and second flow streams together and thereby gradually saturate the lint on said fuzzy cotton seed with said dilute acid solution along the length of said extended flow path from said inlet end thereof to an exit end thereof;

discharging the mixed composite stream of dilute acid solution saturated fuzzy cotton seed at said exit end of said extended flow path in said selected batch quantity into a reaction chamber having a rotatable drum mounted therein,

circulating heated air through said rotatable drum from an inlet opening through a discharge opening while continuously rotating said drum with said batch quantity of cotton seed therein;

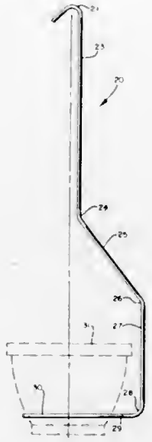
controlling the temperature of said heated air such that the temperature of the heated air at said discharge opening is below the level at which heat damage to the suitability of the seed for planting could occur;

evaporating the water in the dilute acid solution absorbed in the lint on said fuzzy seed by circulating said heated air in said reaction chamber to concentrate the acid and thereby cause hydrolyzation of the lint on said fuzzy seed;

entraining the hydrolyzed lint in the circulating heated air to remove said hydrolyzed lint from said reaction chamber through said discharge opening; and

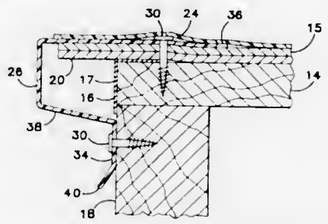
separately removing the batch quantity of delinted seed from said reaction chamber after said batch quantity has been delinted.

5,586,413
SELF ON CENTER LEVELING POT HANGER
Arie N. Sharon, 1322 N. Park Dr., Richardson, Tex. 75081
Filed Oct. 2, 1992, Ser. No. 955,414
Int. Cl.[6] A01G *9/02;* **A47G** *7/02*
U.S. Cl. 47—67 **3 Claims**



1. A plant pot mount comprising: a one piece wire metal member including, a circular portion sized to mount a predetermined range of plant pot sizes and to clear plants in said pots; a lateral extension outwardly from said circular portion; a vertically extended section substantially at right angles to the plane of said circular portion and extending from the outermost portion of said lateral extension so as to be laterally displaced from said circular portion sufficiently to clear a pot mounted in said circular portion and generally to clear plant foliage extending upward from said pot; an inwardly and upwardly directed slanted section connected to the top of said vertically extended section and extended inwardly to a top vertically extended mount section generally parallel and adjacent to a center line projected of the center of said circular portion; and a bent over suspension hook extended from the top of said mount section spanning the center line projection of the center of said circular portion.

5,586,414
SYSTEM FOR RESURFACING A ROOF WITH A CANTILEVER EDGE
Charles Tawzer, Portland, Oreg., assignor to A-1 All Weather Roofing, Inc., Hillsboro, Oreg.
Division of Ser. No. 985,024, Dec. 3, 1992, abandoned. This application Feb. 3, 1994, Ser. No. 191,445
Int. Cl.[6] E04D *13/15*
U.S. Cl. 52—57 **1 Claim**



1. A method of resurfacing a roof having existing roof material overlying a roof base without first removing the existing roof material from the roof base, comprising:

(a) providing an edge strip having a cover portion, with an outer surface that is heat sealable to polymeric film, which overlies a portion of the existing roof material, an escutcheon portion that depends from the cover portion and a terminal portion that depends from the escutcheon portion and overlies the end of the roof base;

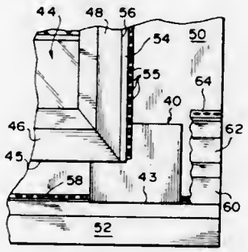
(b) placing said edge strip along an edge of a roof that is covered with existing asphalt singles having a cantilever portion that extends outwardly past the edge of the roof base, with said escutcheon portion wrapping around the cantilever portion so that the cantilever portion does not have to be removed before installing said edge piece;

(c) fastening said edge piece to the roof base along the cover portion and the terminal portion;

(d) thereafter installing polymeric sheet roofing material over the existing shingles with a bottom edge of said material overlying the cover portion of the edge strip; and

(e) heat sealing the bottom edge of the polymeric material to the cover portion.

5,586,415
FLASHING DEVICE FOR USE WITH EXTERIOR SIDING
Fred M. Fisher, 2450 Bass Bay Dr., and Jack R. Powis, 8085 Briarcreek St., both of Tallahassee, Fla. 32312
Filed Jun. 3, 1994, Ser. No. 253,916
Int. Cl.[6] E04D *1/36*
U.S. Cl. 52—58 **7 Claims**



1. A preformed, ready made corner flashing means for creating a moisture-impervious water-directing barrier at either a right or a left corner of a frame of a door or a window located on an exterior wall of a building in cooperation with an exterior wall siding material consisting of a plurality of individual longitudinal panels having a horizontal orientation, wherein a top of each panel includes locking means configured to engage a correspondingly configured engagement means on a bottom of an adjacent overlapping panel for securing the siding panels together, said flashing means comprises a substantially rectangular flat planar structure formed of a flexible, waterproof sheet material selected from the group consisting of foam, vinyl, plastic and coated paper, said flashing means having one corner removed to form a right angle notch configured to fit securely and tightly against any corner of the frame with and under the siding panels so that a minor portion of a wall engaging bottom surface of the flashing means directly contacts and is adhesively secured to the wall adjacent to the frame and a major portion of the wall engaging surface of the flashing means is held away from contact with the wall and in contact with the locking means of one siding panel in an orientation that causes water to be directed along a top water diverting surface of the flashing means and through drain holes in the engagement means of an adjacent siding panel.

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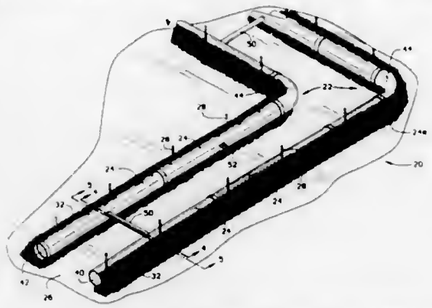
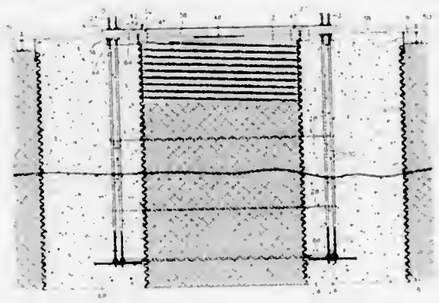
5,586,416
CONCRETE FORM WITH INTEGRAL DRAIN
John Hess, III, 1813 S. 11th, and Harold Hess, 17 Lakewood Dr., both of Belleville, Ill. 62223
Filed Mar. 22, 1995, Ser. No. 408,535
Int. Cl.[6] E02D *19/00*
U.S. Cl. 52—169.5 25 Claims



1. In a concrete form for retaining concrete poured about one side of the form and having at least one tube and a support that supports the tube in spaced-apart relation to an excavation bottom, an improvement comprising

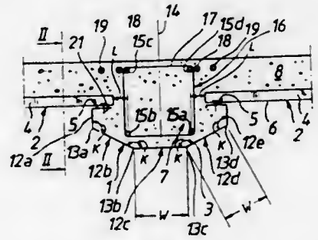
gravel between at least a portion of said tube and the excavation bottom such that the tube and the gravel are positioned to engage liquid concrete poured about one side of the form.

5,586,417
TENSIONLESS PIER FOUNDATION
Allan P. Henderson, 5919 Mohawk Dr., Bakersfield, Calif. 93308, and Miller B. Patrick, 5808 Baywood, Bakersfield, Calif. 93309
Filed Nov. 23, 1994, Ser. No. 346,935
Int. Cl.[6] E02D *5/38;27/32*
U.S. Cl. 52—295 13 Claims



1. A pier foundation subject to high upset forces which comprises a hollow, upright cylindrical structure of heavy post-compressed cementitious material under high compressive loading from the upper end thereof downwardly to a level adjacent the lower end thereof and having open top and bottom ends, a plurality of metal rods and shield means surrounding said rods spaced about said cylindrical structure and extending generally vertically in said cementitious material from said level to said upper end, and tension adjusting structure operatively connected between said rods and said cylindrical structure for tensioning of said rods, said shield means shielding said rods from said cementitious material and permitting said rods to elongate relative to said cementitious material during tensioning, said rods each being heavily tensioned between said level and said upper end to post-compress said cementitious material, and said shield means continuously shielding said rods from said cementitious material to permit said rods to be retensioned as necessary.

5,586,418
COMPOSITE CONSTRUCTION OF REINFORCED CONCRETE
Casper Ålander, and Tarmo Mononen, both of Espoo, Finland, assignors to Rautaruukki Oy, Hameenlinna, Finland
PCT No. PCT/FI93/00276, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO94/01636, PCT Pub. Date Jan. 20, 1994
PCT Filed Jun. 30, 1993, Ser. No. 362,423
Claims priority, application Finland, Jul. 1, 1992, 923052
Int. Cl.[6] E04F *13/12*
U.S. Cl. 52—450 11 Claims



1. A composite construction which has a beam part (1) and a slab part (2) bearing thereon, the construction comprising a combination of at least the following components:

a) a metal mantle (3) of the beam part, the mantle being at the same time the casting form and being made up of an upwardly open profile which has longitudinal surfaces (5) formed by its bended edges and a portion between them;

b) additional reinforcement components (7) which, together with the metal mantle, make up the reinforcement of the composite construction; and

c) a cast component (8), such as concrete, which, when set and together with the metal mantle and with the additional reinforcement components left inside the casting, makes up the composite construction, characterized in that

d) the metal mantle (3) of the beam part (1) is a shaped profile, wherein one surface (10) of the mantle wall is embossed, and the thickness of this mantle wall (9) is such that said embossing will not substantially affect the surface structure of the opposite surface (11) of the wall sheet,

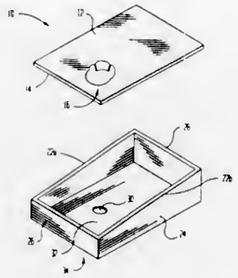
e) the cross-sectional shape of the beam part wall form (3) in the portion between its longitudinal surfaces (5) is defined by sheet portions (12) interconnected by outwardly or inwardly oriented edges (13), corrugations (22) or welded joints (23), or by curved sheet portions (24, 25); and that

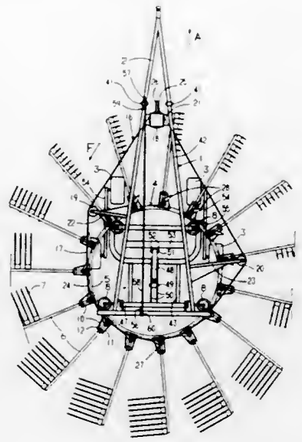
f) the edges of said longitudinal surfaces (5) are oriented towards each other in order to prevent these portions (12, 24, 25) from buckling and becoming detached from the concrete.

5,586,419

Patent Not Issued For This Number

5,586,420
METHOD AND APPARATUS FOR FILLING STRUCTURAL HOLES
Olan D. Harris, 7404 Zoar, Lubbock, Tex. 79424
Filed Dec. 7, 1993, Ser. No. 128,479
Int. Cl.[6] F04G *23/02*
U.S. Cl. 52—514.5 12 Claims





1. A structural hole filling apparatus comprising:

a structural hole filler having a filler receiving means for receiving and holding a structural filler material;

a template having a template bore engagable with said filler receiving means,

said bore for passing structural filler material from within said receiving means into a structural hole located exterior to said receiving means;

said template bore having a lip surface that defines a rim that protrudes below a lower surface of said filler receiving means;

said filler receiving means comprising a filler receiving tray having at least one bore therethrough and a plurality of edges designed to hold the structural filler material therein;

said receiving tray having an upper surface and a lower surface;

said receiving tray upper surface designed to removably engage said template lower surface; and

said rim of said template being adapted to be insertable through said bore of said filler receiving tray;

said receiving tray lower surface being designed to mate with structural surfaces to be filled.

5,586,421
HAYMAKING MACHINE
Jerome Aron, Dossenheim Sur Zinsel, France, assignor to Kuhn S.A., Saverne Cedex, France
Filed Jul. 13, 1995, Ser. No. 501,808
Claims priority, application France, Jul. 13, 1994, 94 08882
Int. Cl.[6] A01D *78/12*
U.S. Cl. 56—367 16 Claims

1. A haymaking machine comprising:

a wheeled supporting structure which can be attached to a tractor;

a swathing rotor supported by said supporting structure and comprising:

a) a ring supported by roller wheels for rotation about an approximately vertical geometric axis,

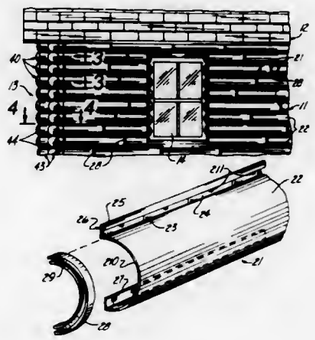
b) a plurality of arms mounted to said ring for rotation about longitudinal axes of said arms,

c) a plurality of working forks mounted to said arms, and

d) a plurality of actuating devices located in proximity to said ring connected to said arms so as to rotate said arms; and

a driven control member supported by said supporting structure and located at least in part near said ring, said control member cooperating with said actuating devices for rotating said arms.

5,586,422
LOG ILLUSION VINYL LOG SIDING
Terrell W. Hoffner, 3128 Indian Rd., Davenport, Iowa 52802
Filed Jun. 16, 1995, Ser. No. 491,391
Int. Cl.[6] E04B *1/10*
U.S. Cl. 52—529 6 Claims



1. Siding apparatus in combination with a building having a planer outer surface thereon, said siding comprising:

a first elongated siding member having an upper edge and a lower edge, first end and a second end;

means for attaching said first siding member to said surface;

a second elongated siding member having an upper edge, a lower edge, a first end and a second end;

means for attaching the upper edge of the first elongated siding member to the lower edge of the second siding member and to said building surface whereby said first and second elongated siding members will cover a portion of said surface;

wherein said first and second siding member are C-shaped in cross-section to resemble logs; and

wherein said means for attaching the upper edge of said first elongated siding member to the lower edge of said second siding member included a strap attached to said surface, said strap having an opening therein through which extends a fastener, said fastener having a first end adjacent to the surface, said first end being larger than the opening; a second end of said fastener being larger than holes in said siding members, said second fastener end being deformable to extend through said holes in the siding and resilient enough to

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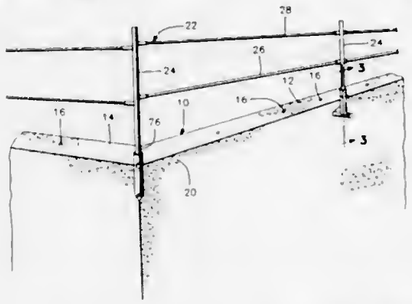
spring back to its original larger shape once through the holes in said siding to thereby hold the siding to said surface.

5,586,423

BUILDING HANDRAIL BRACKET

George P. Mullen, 2956 Rogue River Hwy., Grants Pass, Oreg. 97527

Filed Aug. 2, 1995, Ser. No. 510,163
Int. Cl.[6] E04H *12/10*
U.S. Cl. 52—653.2 **6 Claims**



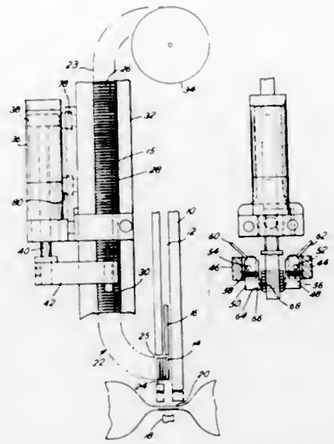
1. In combination with a building construction including a threaded socket member opening horizontally outwardly therefrom, an L-shaped bracket incorporating (1) a tubular lower horizontal leg defining first and second end portions and a longitudinal passage extending therethrough opening outwardly through said end portions and (2) an upstanding leg rigidly supported from and projecting upwardly from said second end portion, said upstanding leg defining a support structure operative to releasably support the lower end of an upstanding railing post therefrom in predetermined height adjusted position relative to said bracket, and threaded fastener structure extending through said passage and removably threaded into said threaded socket member, said second end portion including an end face opposing and tightly seated against said socket member, said socket member being fixedly anchored in said building construction independent of said threaded fastener.

5,586,424

APPARATUS FOR MOVEMENT OF U-SHAPED CLIPS ALONG A RAIL

Kuo-Raid G. Chen, Cary; Raymond H. Misner, Raleigh; Elbert P. Windham, Fuquay-Varina, and Bernard D. Richardson, Apex, all of N.C., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Continuation of Ser. No. 188,020, Jan. 28, 1994, abandoned, which is a continuation of Ser. No. 883,648, May 15, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,524
Int. Cl.[6] B65B *51/04*
U.S. Cl. 53—138.2 **2 Claims**



1. In apparatus for attaching a U-shaped metal clip of the type having a pair of spaced parallel legs connected at respective ends by a crown about gathered material, said apparatus including a housing having at least one clip channel for receipt of at least one U-shaped clip, at least one punch for driving a clip present in the channel about gathered material, a window for feeding at least one clip into said one channel into the pathway of said punch, at least one guide rail for supporting a plurality of aligned clips for feeding one at a time through said window into said channel in the pathway of said punch, said guide rail having an inside surface opposite side surfaces and an outside surface, the improvement comprising:

clip feed means for advancing the clips on said guide rail and into said window, said clip feed means comprising, in combination:

(a) a U-shaped arm which is supported in opposed relation to and over a series of stacked clips on the guide rail, said clips each having the clip legs extending on the opposite side surfaces of the rail and said clips further each having the crown connecting said clip legs on the inside surface, said clips aligned side by side and stacked and connected to one another along the crowns, said arm including parallel first and second runs extending on the opposite sides of the rail in opposed relation to said first and second clip legs respectively, said arm further including an arm connection section connecting said first and second runs, said arm section being positioned on the outside of the guide rail;

(b) first and second jaw members pivotally mounted on said first and second runs of the arm respectively each one of the jaw members extending over a clip leg and positioned for pivotal movement about a pivot axis to and from positions in which an end of each jaw member is pressed against the side of and thereby engaged against a leg of the stacked, connected clips on each side of the rail respectively;

(c) biasing means for biasing each jaw member about its pivot axis into said position of engagement with a clip leg;

(d) a support rod connected to the arm at the arm connection section for driving the legs generally parallel in the direction of the guide rail;

(e) means for driving the rod in a first direction with each of the jaw members engaged with a clip leg of the same clip to thereby advance the clips on the guide rail into the window, said means fox driving operable in the opposite direction for positioning of the arm and jaw members by sliding the jaw members over clip legs to thereby position the jaw members for driving of additional clips, each of said jaw members including at least one clip engaging tooth shaped for maintaining both of the jaw members in driving contact with the same clip legs in the first direction and for release of driving contact of the clips legs when moved in the opposite direction, said tooth including a first surface generally at a right angle to the rail and a second surface at an acute angle with respect to the rail to form a tooth pointed in the direction of clip travel; and

(f) a clip retention rail spaced from and generally parallel to the guide rail along the length of the inside surface, said clip retention rail positioned with the crowns of the clips between the guide rail and retention rail hereby the crowns are positioned slidably between the guide rail and retention rail;

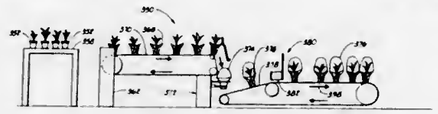
said clip feed means defining means for feeding of stacked, connected clips by pressure against and engagement of the clip engaging teeth against the sides of the clip legs of one of the stacked, connected clips located adjacent the clip feed means with the clips retained on the guide rail by the retention rail as the jaws drive the clips when the arm moves in the first direction, but not the opposite direction.

5,586,425

ARTICLE PACKAGING SYSTEM AND METHOD

Frank Craig, Valley Park, Mo.; Joseph G. Straeter, and Donald E. Weder, both of Highland, Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 954,635, Sep. 30, 1992, abandoned. This application Apr. 5, 1995, Ser. No. 417,477
Int. Cl.[6] B65B *5/04*
U.S. Cl. 53—449 **61 Claims**



1. A method of packaging a potted plant comprising the steps of:

providing a sleeving station having automatic sleeving means for automatically applying a preformed sleeve;

automatically opening the preformed sleeve and automatically disposing a decorative cover into the opened preformed sleeve;

providing a plurality of potted plants, each having an exterior surface;

sequentially conveying each potted plant to the sleeving station via conveying means having a distal end near the sleeving station;

sequentially delivering each potted plant to guiding means arranged at the distal end of the conveying means through which guiding means each potted plant is automatically passed downwardly and thereby automatically oriented and maintained in an upright orientation for placement into an opened sleeve and placing each such uprightly oriented potted plant into the opened sleeve and into the cover therein forming a sleeved covered potted plant; and

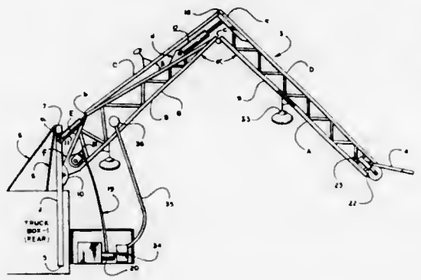
automatically removing each sleeved covered potted plant from the sleeving station.

5,586,426

SEMI-AUTOMATED HARVESTER

James P. Warkentine, 832 Atlanta Hwy., Cumming, Ga. 30130

Continuation-in-part of Ser. No. 325,895, Oct. 18, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 402,009
Int. Cl.[6] A01D *51/00;46/00*
U.S. Cl. 56—327.1 **9 Claims**



1. A method for harvesting fruits and vegetables comprising the following steps:

(a) mounting the base end of a boom to a collection vehicle;

(b) deploying the free end of the boom directly toward, away from, or around the collection vehicle in a field of fruits or vegetables to be harvested;

(c) providing a conveying device connected to the boom;

(d) collecting at least one fruit or vegetable with the conveying device;

(e) propelling the conveying device along the boom to a collection point on the collection vehicle where the fruit or vegetable is released; and

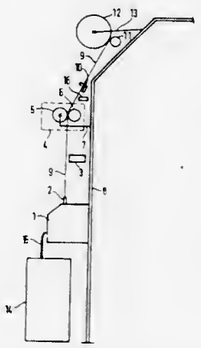
(f) returning the conveying device to the free end of the boom for collecting another fruit or vegetable.

5,586,427

DEVICE FOR ADJUSTING THE CONTACT PRESSURE OF A PRESSURE ROLLER AGAINST THE DRAW-OFF SHAFT OF A ROTOR SPINNING MACHINE

Romeo Pohn, and Edmund Schuller, both of Ingolstadt, Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed May 25, 1995, Ser. No. 450,387
Claims priority, application Germany, Sep. 3, 1994, 44 31 537.6
Int. Cl.[6] D01H *7/46;7/92*
U.S. Cl. 57—264 **12 Claims**



1. A yarn draw off device for use with a spinning machine, said device comprising:

a pressure roller;

a rotatably driven draw-off shaft, said pressure roller in contact with said draw-off shaft and rotatably driven thereby whereby a yarn continuously produced in the spinning machine is draw off between said pressure roller and said draw-off shaft in a continuous yarn producing configuration of said spinning machine; and

an adjustable mounting device for said pressure roller, said pressure roller rotatably mounted on said mounting device, said mounting device selectively movable relative to said draw-off shaft in said continuous yarn producing configuration, thereby providing selectable varied contact pressures between said pressure roller and said draw-off shaft in said continuous yarn producing configuration.

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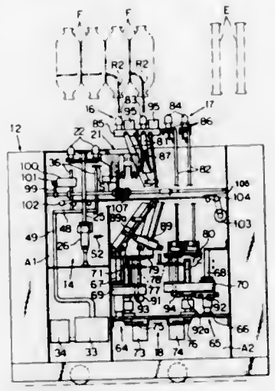
5,586,428

ROVING BOBBIN CHANGING METHOD AND APPARATUS FOR SPINNING MACHINE

Isao Asai, and Toshinori Hasegawa, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jul. 20, 1994, Ser. No. 277,899
Claims priority, application Japan, Jul. 26, 1993, 5-184152
Int. Cl.[6] D01H *9/00;9/10*
U.S. Cl. 57—269 11 Claims



2. A roving bobbin changing apparatus including roving end finding/pick-up means for finding and picking up roving ends from at least two full roving bobbins disposed on an auxiliary rail extending alongside a creel of a spinning machine, roving tying means for tying to rovings of roving-depleted bobbins said roving ends that have been found and picked up from said full roving bobbins, and roving bobbin exchanging means for transferring said roving-depleted bobbins to said auxiliary rail while transferring to bobbin hangers of said creel said full roving bobbins from which previously tied rovings are being delivered for spinning, said apparatus being characterized in that:

said roving bobbin changing apparatus comprises a roving end finding/pick-up section and a roving tying/bobbin exchange section; and

said roving-end finding/pick-up means is disposed in said roving end finding/pick-up section and said roving bobbin exchanging means is disposed in said roving tying/bobbin exchange section, said roving end finding/pick-up section being coupled to said bobbin changing apparatus at a position ahead of said roving tying/bobbin exchange section when viewed in the direction of movement of said bobbin changing apparatus relative to said spinning machine for substantially concurrent and cyclical operation with said roving tying means and said roving bobbin exchanging means, said roving bobbin exchanging means being reciprocatably movable between said roving end finding/pick-up section and said roving tying/bobbin exchange section; and driving means for moving said roving bobbin exchanging means to a position for grasping new rovings in said roving end finding/pick-up section, and to a roving tying position corresponding to that of full roving bobbins transfer means in said roving tying/bobbin exchange section;

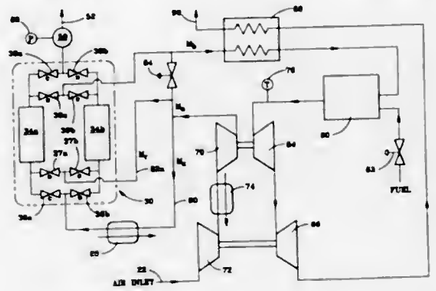
such that said roving end finding/pick-up means finds and picks up roving ends from at least two full roving bobbins while said roving tying means ties roving ends found and picked up in an immediately preceding cycle by said roving end finding/pick-up means to rovings of roving depleted bobbins and said roving bobbin exchanging means transfers said roving depleted bobbins to said auxiliary rail while transferring to said bobbin hangers said full roving bobbins which have had roving ends tied in the current cycle and from which rovings are concurrently being delivered.

5,586,429

BRAYTON CYCLE INDUSTRIAL AIR COMPRESSOR

James B. Kessell, Mont Vernon, N.H., and Stephen P. Baldwin, Charlotte, N.C., assignors to Northern Research & Engineering Corporation, Woburn, Mass.

Filed Dec. 19, 1994, Ser. No. 359,259
Int. Cl.[6] F02C *7/00*
U.S. Cl. 60—39.07 10 Claims



1. An apparatus comprising:

a combustion chamber;

a supply of fuel being provided to the combustion chamber;

a first turbine which is driven by exhaust gases leaving the combustion chamber;

a second turbine which is driven by exhaust gases leaving the first turbine;

a first compressor driven by the second turbine for compressing inlet air;

a second compressor driven by the first turbine for compressing the compressed air from the first compressor, the compressed air from the second compressor being divided into two portions, the first portion being provided to the combustion chamber, this first portion defining a combustion air portion, the second portion being extracted to form a supply of compressed air, this second portion defining a supply air portion; and

a means for cooling the supply air portion;

a dryer system for removing moisture from the supply air portion, the dryer system including a moisture absorption substance capable of being regenerated by the application of air having a temperature higher than the temperature of the cooled supply air portion, a further portion of the combustion air portion being applied to the moisture absorption substance for regenerating the moisture absorption substance, this portion of the combustion air portion defining a regeneration air portion.

5,586,430

BALANCED DUAL FLOW REGENERATOR HEAT EXCHANGER SYSTEM AND CORE DRIVING SYSTEM

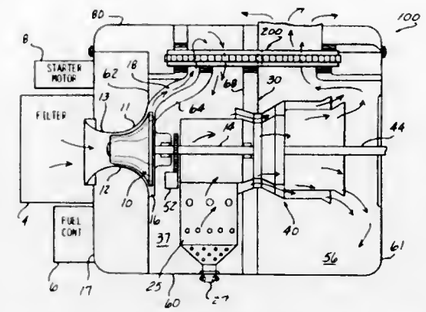
John M. Stopa, 6659 W. Torch Lake Dr., Kewadin, Mich. 49648

Division of Ser. No. 301,003, Sep. 6, 1994, Pat. No. 5,538,073.
This application May 15, 1995, Ser. No. 440,771
Int. Cl.[6] F02C *7/105*
U.S. Cl. 60—39.511 32 Claims

1. A gas turbine engine for producing power from a fluid medium, said turbine engine comprising:

a gas generator having a compressor member for compressing the fluid medium, a first turbine member for driving said compressor member and a combustion member interposed said compressor member and said first turbine member for increasing the temperature of the fluid medium prior to said first turbine member;

a second turbine member adjacent to said gas generator for extracting power from the fluid medium as the fluid medium passes through said second turbine member; and



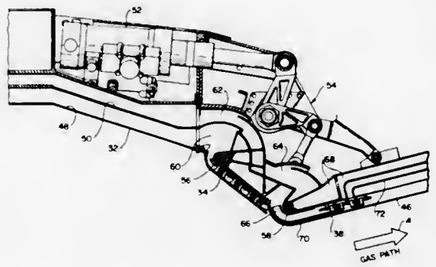
a rotary heat scavenging member adjacent to said gas generator, said rotary heat scavenging member passing the fluid medium from said compressor member at least two times through said rotary scavenging member and passing the fluid medium from said second turbine once through said rotary scavenging member.

5,586,431

AIRCRAFT NACELLE VENTILATION AND ENGINE EXHAUST NOZZLE COOLING

Douglas A. Thonebe, Jupiter, and Russell L. Coons, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1994, Ser. No. 349,843
Int. Cl.[6] F02K *1/12;3/04*
U.S. Cl. 60—226.1 15 Claims



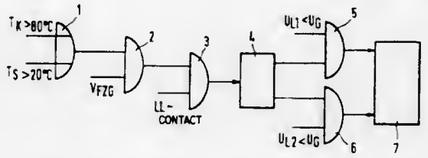
1. A combined purging and cooling system for the nacelle of an aircraft and the edge pieces of the flap of a two-dimensional exhaust nozzle of a gas turbine engine comprising a double clam shell convergent flap and divergent flap, means defining in said convergent flap a pair of side by side passageways, one of said passageways for conducting fan air and the other of said passageways for conducting nacelle air, pumping means including a tubular manifold member and a plurality of supersonic nozzles in said tubular manifold member in fluid communication with said passageway conducting fan air, a cavity adjacent to said other of said passageways in fluid pumping relationship with said supersonic nozzles for pumping said nacelle air, a rectangular mixing plenum in communication with said cavity for mixing the fan air and the nacelle air, transfer means in fluid communication with said rectangular mixing plenum for conducting mixed fan air and nacelle air to the exterior surface of the edge pieces of said exhaust nozzle and a source of fan air and nacelle air.

5,586,432

DEVICE FOR REGULATION OF A MOTOR VEHICLE ENGINE AT IDLE SPEED

Gerhart Huemer, Neukeferloh, and Heinz Lemberger, Unterfoehring, both of Germany, assignors to Bayerische Motoren Werke AG, Munich, Germany

Filed Oct. 11, 1994, Ser. No. 320,317
Claims priority, application Germany, Oct. 11, 1993, 43 34 557.3
Int. Cl.[6] F01N *3/20*
U.S. Cl. 60—274 16 Claims



1. A device for operating a motor vehicle engine at idle, said engine having two rows of cylinders, and a catalytic converter and an oxygen sensor operatively associated with each of said two rows, the device comprising:

means for alternately shutting-off injectors of one of said two rows of cylinders during idle operation of the engine when a temperature (T) of the associated catalytic converter is above a predetermined temperature limit (T_G); and

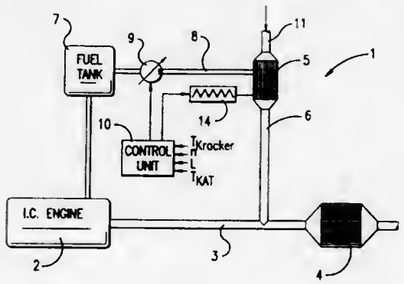
means for switching an injection valve shut-off from one row of cylinders to the other row of cylinders when the temperature (T) of said catalytic converter associated with said row of cylinders having just been shut-off falls below the predetermined temperature limit (T_G).

5,586,433

PROCESS AND APPARATUS FOR SELECTIVE CATALYZED NO-REDUCTION IN OXYGEN-CONTAINING EXHAUST GASES

Walter Boegner, Remseck; Michael Kraemer, Notzingen; Bernd Krutzsch, Denkendorf; Guenter Wenninger, Stuttgart; Friedrich Wirbeleit, Esslingen, and Werner Weisweiler, Remchingen, all of Germany, assignors to Daimler-Benz AG, Germany

Filed Feb. 14, 1995, Ser. No. 388,037
Claims priority, application Germany, Feb. 14, 1994, 44 04 617.0
Int. Cl.[6] F01N *3/36*
U.S. Cl. 60—274 10 Claims



1. An arrangement for selective catalyzed NO_x-reduction in oxygen-containing exhaust gases of a diesel internal-combustion engine, comprising an exhaust pipe operatively connected with the engine, an exhaust gas purifier arranged in the exhaust pipe, a fuel tank operatively connected with an engine intake of the engine, a cracked catalyst in fluid communication with the exhaust pipe

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upstream of the exhaust gas purifier and thermally isolated from a flow of exhaust gas from the engine, an air pipe operatively associated with the cracked catalyst, a metering pipe operatively arranged between the fuel tank and cracked catalyst, a motoring pump arranged in the metering pipe to meter diesel fuel stored in the fuel tank to the cracked catalyst, wherein a defined fuel quantity from the stored fuel is catalytically cracked to produce a substantial portion of short-chained unsaturated hydrocarbons,

and the defined fuel quantity is oxidizable by air simultaneously supplied thereto from the air pipe, and a supply pipe provides the fluid communication between the exhaust pipe and the cracked catalyst for supplying in metered amounts the short-chained unsaturated hydrocarbons to the exhaust gas upstream of the exhaust gas purifier for purifying the exhaust gas.

5,586,434

ONE WAY CLUTCH MECHANISM FOR A TORQUE CONVERTER

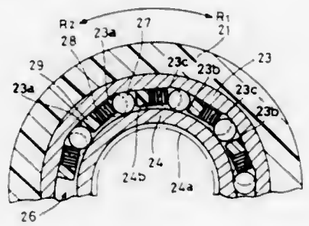
Mamoru Okubo, Neyagawa, and Koji Yoneyama, Shijyonawate, both of Japan, assignors to Exedy Corporation, Osaka, Japan

Filed Aug. 30, 1995, Ser. No. 520,795

Claims priority, application Japan, Sep. 13, 1994, 6-219233

Int. Cl.[6] F16D *41/06*

U.S. Cl. 60—345 **3 Claims**



1. A stator assembly for a torque converter assembly, comprising:

an inner race;

a metal outer race having a plurality of friction surfaces formed on an inner circumferential portion, a distance between a first point of each of said friction surfaces and an outer surface of said inner race being smaller than the distance between a second point of each of said friction surfaces and said outer surface of said inner race;

a ring-shaped resin stator carrier molded about at least an outer circumference of said outer race to be integral therewith, said ring-shaped resin stator carrier formed with a plurality of supporting elements, said supporting elements extending axially between said inner race and said outer race;

a one-way clutch mechanism including a plurality of rolling elements disposed between said inner race and said outer race, one of said rolling elements disposed between each pair of adjacent ones of said supporting elements, a plurality elastic elements, one elastic element disposed adjacent to each of said supporting elements for urging said rolling elements in a first circular direction.

3. A method of manufacturing a stator carrier having a one way clutch mechanism for a torque converter, comprising:

providing an outer race member with a plurality of cirumferentially inclined surfaces and a plurality of concave portions, one concave portion formed between each pair of adjacent inclined surfaces;

positioning a mold concentrically within the outer race, the mold formed with a plurality of inclined surfaces corresponding to the inclined surfaces on the outer race;

rotating the mold relative to the outer race bringing the inclined surfaces on the mold into engagement with the inclined surfaces on the outer race; and

injecting resin into spaces defined between the mold and the outer race forming protruding members therebetween and further forming a stator carrier around the outer periphery of the outer race.

5,586,435

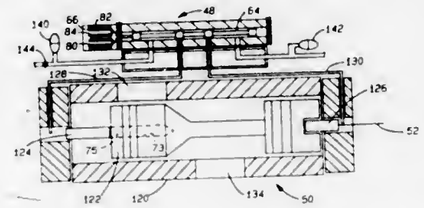
HYDRAULIC CLOSED LOOP CONTROL SYSTEM

George P. Kokalis, Ann Arbor, Mich., assignor to Servo Kinetics, Ann Arbor, Mich.

Continuation of Ser. No. 389,071, Jan. 3, 1995, abandoned, which is a continuation of Ser. No. 94,508, Jul. 20, 1993, abandoned. This application Oct. 13, 1995, Ser. No. 543,207

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—416 **1 Claim**



1. A hydraulic control system for a die casting machine of the type having a shot cylinder with first and second ports and applying a force on a shot plunger for forcing molten metal into a casting die, said control system comprising:

a source of hydraulic fluid acting on said shot cylinder first port for applying a force on said shot plunger urging said shot plunger to force said molten metal into said die,

a servo valve having a single translatable servo spool for metering a servo control pressure source and a return line providing first and second servo control pressure signals, said servo spool being urged to translate by direct mechanical connection to a voice coil actuator having a permanent magnet affixed to a housing of said servo valve and a relatively moveable coil which is directly affixed to said servo spool such that they move linearly together, said servo valve further having a first position transducer providing a first output signal related to positioning of said servo spool,

a proportional spool valve having a metering spool translatable in response to first and second shift control pistons acting on opposite ends of said metering spool, said metering spool providing a variable restriction for flow of said hydraulic fluid from said shot cylinder second port thereby controlling pressure differentials acting on said shot plunger and thus controlling forcing of molten metal into said casting die, said proportional valve further having a second position transducer providing a second output signal related to positioning of said metering spool,

conduit means for communicating said first and second servo control pressure signals with said first and second shift control pistons thereby enabling said servo valve to control said proportional spool valve to provide control of said variable restriction, and

a third position transducer coupled to said shot plunger and providing a position signal related to the position of said shot plunger, said position signal and said second output signal resulting in a control signal, said control signal being utilized in conjunction with said first output signal for causing movement of said movable coil in response thereto,

a first hydraulic accumulator in said servo valve control pressure source,

a second hydraulic accumulator in said servo valve control pressure return,

an intermediate holding mounted directly to said proportioned spool valve and having a fluid capacity greater than the capacity of said shot cylinder; and

controller means for receiving said position signal and said second output signal and producing said control signal as a result thereof, said controller means also receiving said first output signal, said first output signal and said control signal being utilized by said control means to generate a signal to be applied to said voice coil thereby enabling control over said shot cylinder.

5,586,436

MASTER CYLINDER RESERVOIR

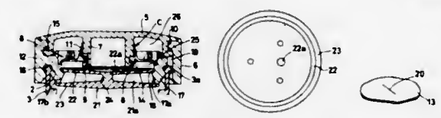
Shozo Sakaguchi; Mitsuhiro Ikeda, and Syusaku Chiba, all of c/o Matsuyama Plant, Jidosha Kiki Co., Ltd. 11-6, Shinmei-cho, 2-chome, Higashimatsuyama-shi, Saitama-ken, Japan

Filed Jun. 23, 1995, Ser. No. 494,679

Claims priority, application Japan, Jun. 30, 1994, 6-148908

Int. Cl.[6] B60T *11/26*

U.S. Cl. 60—585 **2 Claims**



1. A master cylinder reservoir comprising a diaphragm interposed between a cap and a body to define an upper chamber communicating with the outside and a lower chamber communicating with a reservoir chamber, said diaphragm having upper and lower surfaces and a peripheral edge, and a slit or an air valve is formed in said diaphragm so that said slit or said valve is opened by the deformation of said diaphragm caused by the pressure difference acting on the upper and lower surfaces of said diaphragm, by which communication is permitted between said upper and lower chambers, wherein a plate is disposed below said diaphragm in such a manner as to substantially cover said diaphragm, said plate including upper and lower surfaces, and a vent hole communicating between the upper and lower surfaces of said plate is provided, wherein the peripheral edge of said diaphragm is extended downwardly, and said plate is fixed to said extended portion, wherein a step portion is formed at the middle position on the inner peripheral surface of said extended portion, said plate comprises an upper disk portion, a lower disk portion, and a column portion for connecting the two disk portion with each other at the center thereof, and said plate is fixed to said diaphragm by engaging said upper disk portion with said step portion and engaging said lower disk portion with the lower end of said extended portion.

5,586,437

MRI CRYOSTAT COOLED BY OPEN AND CLOSED CYCLE REFRIGERATION SYSTEMS

Leo Blecher, Schenectady, N.Y.; Ralph C. Longsworth, Allentown, Pa.; F. Scott Murray, Schenectady; Philip A. Jonas, Albany, both of N.Y., and Michael Bolarski, Moscow, Russian Federation, assignors to Intermagnetics General Corporation, Latham, N.Y.

Filed Sep. 6, 1995, Ser. No. 524,400

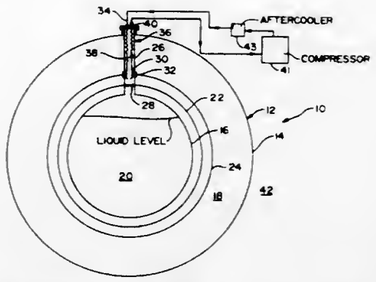
Int. Cl.[6] F17C *5/02*

U.S. Cl. 62—47.1 **22 Claims**

1. A cryostat system for maintaining a load at a predetermined cryogenic temperature, comprising:

a chamber for containing in an interior volume a liquid cryogenic refrigerant, said chamber having a vent tube connected between said interior volume and an ambient environment of said cryostat;

an evacuated housing surrounding said chamber, said vent tube extending through an evacuated space within said housing to said ambient environment;



a first thermal intercept positioned within said evacuated space between said chamber and said ambient environment, a first heat transfer relationship existing between said first thermal intercept and said vent tube, heat from said first thermal intercept being transferred to gaseous refrigerant which, in use, boils off from said liquid in said chamber and flows through said vent tube to said ambient environment;

a second thermal intercept positioned within said evacuated space between said first thermal intercept and said ambient environment;

a refrigerant evaporator within said evacuated space, a second heat transfer relationship existing between said second thermal intercept and said evaporator, heat from said second thermal intercept being transferred, in use, to refrigerant in said evaporator, said evaporator, in use, being part of a closed cycle vapor compression refrigeration unit;

a temperature for said load being determined by a boiling temperature of said liquid refrigerant in said vented chamber, said first thermal intercept being generally warmer than said load temperature, said second thermal intercept being generally warmer than said first thermal intercept and colder than a temperature of said ambient environment.

5,586,438

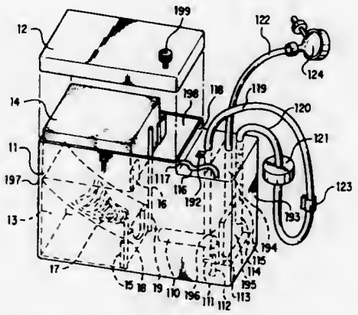
PORTABLE DEVICE FOR PRESERVING ORGANS BY STATIC STORAGE OR PERFUSION

Gregory M. Fahy, Gaithersburg, Md., assignor to Organ, Inc., and LRT, Inc., both of Chicago, Ill.

Filed Mar. 27, 1995, Ser. No. 411,274

Int. Cl.[6] F24F *3/16;* **F25D** *3/08*

U.S. Cl. 62—78 **21 Claims**



1. A device for holding an organ, comprising:

an organ container;

a lower organ receiving portion located within the organ container; and

an upper organ receiving portion located within the organ container and spaced from said lower organ receiving portion.

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wherein the upper and lower organ receiving portions are configured to contact and immobilize an organ.

5,586,439

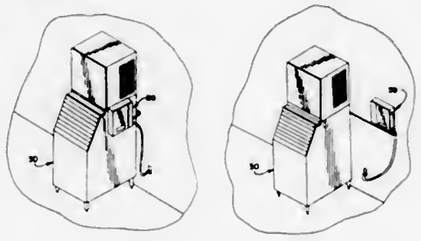
ICE MAKING MACHINE

Charles E. Schlosser, Manitowoc; Lee G. Mueller, Kewaunee, and Gregory McDougal, Manitowoc, all of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation of Ser. No. 201,758, Feb. 25, 1994, Pat. No. 5,408,834, which is a continuation of Ser. No. 989,791, Dec. 11, 1992, Pat. No. 5,289,691. This application Apr. 24, 1995, Ser. No. 429,286

Int. Cl.[6] F25C *1/14*

U.S. Cl. 62—78 **27 Claims**



21. A method of automatically cleaning the surfaces of an ice making machine comprising

i) a coolant/refrigerant system having a compressor, a condenser, an evaporator, an expansion device and a hot gas valve for directing hot gases from the compressor to the evaporator;

ii) a water/ice system comprising a fresh water inlet, a water reservoir, a water circulation mechanism, and an ice forming evaporator plate; and

iii) an electronic controlling/monitoring system comprising a microprocessor which controls the compressor, the water circulation mechanism and the hot gas valve; the method comprising the steps of:

a) stopping the compressor;

b) performing a wash cycle by

i) starting the water circulation mechanism;

ii) adding a cleaning/sterilizing solution to water in the water/ice system; and

iii) circulating the water containing the cleaning/sterilizing solution through the water reservoir and over the ice forming evaporator plate for a period of time after step b) i), said period of time being controlled by the microprocessor;

c) automatically stopping the circulation of water containing the cleaning/sterilizing solution over the ice forming evaporator plate after said period of time, and

d) performing a rinse cycle in which the microprocessor controls the water/ice system to automatically operate through a series of multiple rinse operations in each of which fresh water is introduced through the fresh water inlet and water from the water reservoir is removed from the water/ice system, thereby ensuring a complete rinsing of the cleaning/sterilizing solution from the water/ice system.

5,586,440

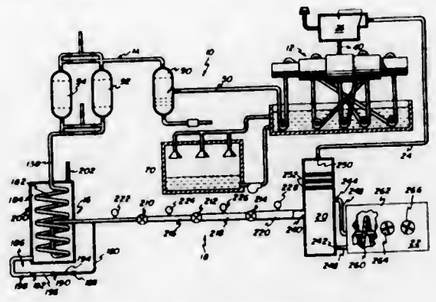
PNEUMATIC REFRIGERATION SYSTEM AND METHOD

David M. Vincent, c/o Chester, Willcox & Saxbe 17 S. High St., Suite 900, Columbus, Ohio 43215-3413

Filed Dec. 6, 1994, Ser. No. 349,918

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—87 **9 Claims**



1. A pneumatic refrigeration system comprising:

a compressor for generating a pressure increase in an air flow;

a system expander downstream of the compressor for reducing a temperature of the air flow;

a precooler downdstream of the compressor and upstream of the system expander for cooling the air flow prior to expansion, wherein the precooler includes a precooling expander for expanding a portion of the air flow and a precooling heat exchanger for exchanging heat from a remainder of the air flow to that portion of the air flow; and

a recycling conduit downstream of the system expander for conducting at least a part of the air flow toward the compressor.

5,586,441

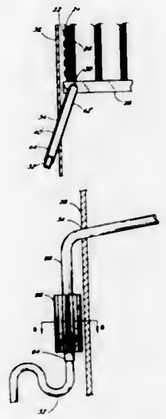
HEAT PIPE DEFROST OF EVAPORATOR DRAIN

Wilbert J. Wilson, Fullerton, Calif., and Robert G. O'Neal, Yuma, Ariz., assignors to Russell A Division Of Ardco, Inc., Brea, Calif.

Filed May 9, 1995, Ser. No. 438,169

Int. Cl.[6] F25D *17/02*

U.S. Cl. 62—99 **17 Claims**



13. A method of passively defrosting a drain from a drain pan located beneath an evaporator in a refrigeration circuit, comprising the steps of:

a) placing a condenser end of a sealed heat pipe in heat transfer relation with an inlet to said drain; and

b) exposing an evaporator end of said heat pipe to a heat source such that a heat transfer fluid within said heat pipe is heated to a vapor phase.

5,586,442

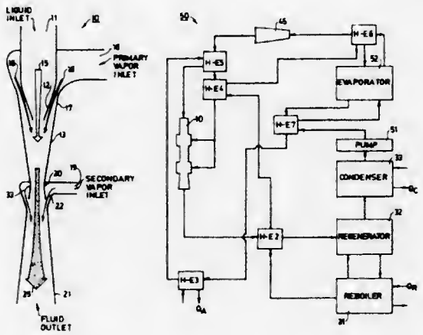
THERMAL ABSORPTION COMPRESSION CYCLE

Carl D. Nicodemus, Satellite Beach, Fla., assignor to Helios Research Corp., Mumford, N.Y.

Filed Oct. 17, 1994, Ser. No. 324,779

Int. Cl.[6] F25B *15/00*

U.S. Cl. 62—107 **48 Claims**



1. In an absorption cycle system using an absorbent liquid and an absorbable working fluid, the improvement comprising:

a. a system stream of working fluid vapor directed to merge with a system stream of absorbent liquid so that the kinetic energy of the vapor accelerates the liquid stream while an absorbable portion of the vapor is absorbed in the liquid stream and an unabsorbable additional portion of the vapor is entrained in the liquid stream; and

b. a nozzle and a diffuser receiving the combined liquid and vapor streams and converting fluid velocity to pressure applied to a liquid mixture containing substantially more of the working fluid than can be absorbed in the absorbent liquid stream.

5,586,443

REFRIGERANT CONSERVATION SYSTEM AND METHOD

Gordon A. C. Lewis, Ronkonkoma, N.Y., assignor to Conair Corporation, Garden City Park, N.Y.

Filed Sep. 20, 1995, Ser. No. 530,961

Int. Cl.[6] F25B *1/00*

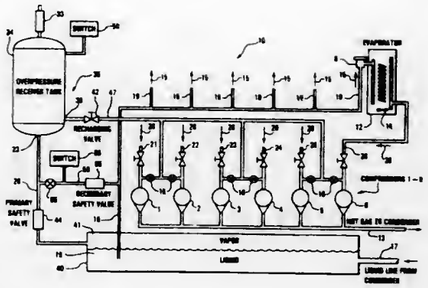
U.S. Cl. 62—115 **20 Claims**

12. A method for preventing the release of refrigerant to the atmosphere from a mechanical refrigeration system having a plurality of compressors, comprising:

providing a refrigerant overpressure receiver tank for receiving refrigerant from a high pressure side of the mechanical refrigeration system,

preventing a first overpressure flow of refrigerant to the receiver tank unless the pressure on said high pressure side of the refrigerant loop exceeds a first predetermined value which is higher than the safe operating pressure of said high pressure side of the refrigerant loop,

collecting refrigerant from said high pressure side in the overpressure receiver tank when the pressure on said high pressure side exceeds said first predetermined value,



preventing further operation of at least one but not all of said plurality of compressors in the mechanical refrigeration system when the pressure in said overpressure receiver tank exceeds a second predetermined value which is substantially lower than said safe operating pressure, and

continuing the operation of at least one of said plurality of compressors in the mechanical refrigeration system while said further operation of at least one compressor is prevented.

5,586,444

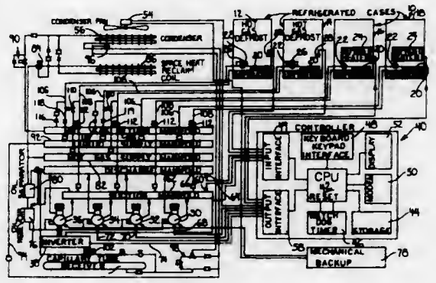
CONTROL FOR COMMERCIAL REFRIGERATION SYSTEM

Kwok K. Fung, South Bend, Ind., assignor to Tyler Refrigeration, Niles, Mich.

Filed Apr. 25, 1995, Ser. No. 428,580

Int. Cl.[6] F25B *7/00;* **F04B** *41/06*

U.S. Cl. 62—117 **31 Claims**



1. Capacity control system for a commercial refrigeration system having at least one refrigerator case, said refrigeration system including a compressor system for compressing refrigerant, said compressor system including a variable speed compressor and fixed speed compressors whereby the capacity of said system can be controlled by varying the speed of the variable speed compressor and by turning said fixed speed compressors on or off, said control system including load sensing means for detecting a variable indicative of the refrigeration load on the system, means for comparing said variable with a target value and generating a difference signal varying in accordance with the difference between the variable and the target value, and calculating means for calculating a compressor control signal for controlling the capacity of said system as a function of the second derivative with respect to time of said difference signal.

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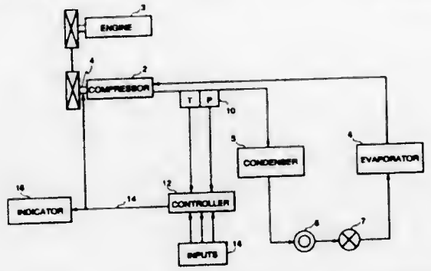
5,586,445

LOW REFRIGERANT CHARGE DETECTION USING A COMBINED PRESSURE/TEMPERATURE SENSOR

Warren F. Bessler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1994, Ser. No. 315,804
Int. Cl.[6] F25B *49/02*
U.S. Cl. 62—126 **10 Claims**



1. A low refrigerant charge detecting system for a refrigeration system having a compressor, said low refrigerant charge detecting system comprising:

a combined pressure and temperature sensor located near the discharge of said compressor; and

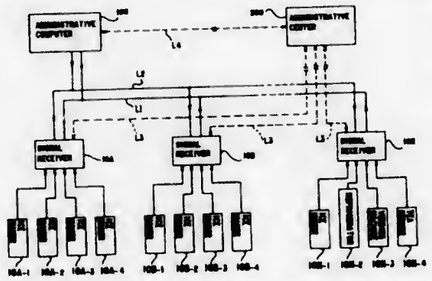
a controller coupled to said combined pressure and temperature sensor wherein said controller produces a low charge signal in response to a high discharge temperature and a low discharge pressure is detected by said pressure and temperature sensor from said compressor.

5,586,446

MONITORING SYSTEM FOR ICE MAKING MACHINE

Hiroshi Torimitsu, Nagoya, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Continuation of Ser. No. 152,501, Nov. 16, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,719
Int. Cl.[6] F25B *49/02*
U.S. Cl. 62—126 **6 Claims**



1. A monitoring system for a plurality of ice making machines each of which includes an ice making mechanism, a detection device for detecting operating condition of the ice making mechanism and control means for electrically controlling operation of the ice making mechanism in accordance with the detected operating condition,

wherein the ice making machines each are provided with output means for issuing electric signals respectively indicative of the detected operating condition and an identity number for identifying each type of the ice making machines outwardly, and

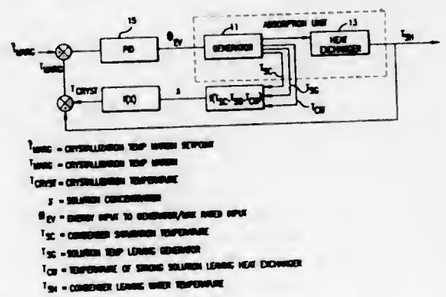
wherein the monitoring system comprises a signal receiver for monitoring each operation of the ice making machines on a basis of the electric signals applied thereto from said output means, said signal receiver including means responsive to the electric signals for determining each of the ice making machines as being operated in an abnormal condition if the detected operating condition becomes abnormal in comparison with a control data for the ice making machine identified by the identity number and alarm means for informing an operator of the abnormality in operation of the ice making machine identified by the identity number.

5,586,447

CONCENTRATION CONTROL IN AN ABSORPTION CHILLER

Lee L. Sibik, and Mark D. Berget, both of Onalaska, Wis., assignors to Gas Research Institute, Chicago, Ill.

Filed Jul. 20, 1994, Ser. No. 278,539
Int. Cl.[6] F25B *15/06*
U.S. Cl. 62—141 **13 Claims**



1. In an absorption cooling process in which an absorbent-refrigerant solution from an absorber is heated in a generator producing an absorbent-refrigerant vapor, said absorbent-refrigerant vapor is separated and condensed producing a substantially pure liquid refrigerant and an absorbent-enriched solution, said absorbent-enriched solution is circulated through a heat exchanger in heat exchange relationship with said absorbent-refrigerant solution from said absorber producing a reduced temperature absorbent-enriched solution, said reduced temperature absorbent-enriched solution is returned to said absorber, said substantially pure liquid refrigerant is evaporated producing a substantially pure refrigerant vapor, and said substantially pure refrigerant vapor is absorbed into said reduced temperature absorbent-enriched solution producing said absorbent-refrigerant solution, the improvement comprising:

calculating the concentration of absorbent in said absorbent-enriched solution using an iteration algorithm based upon a saturated temperature of said substantially pure refrigerant vapor, said absorbent-enriched solution temperature, and an initial guess of the concentration of absorbent in said absorbent-enriched solution;

calculating a crystallization temperature of said absorbent-refrigerant solution based on a concentration of said absorbent-enriched solution;

measuring the temperature of said absorbent-enriched solution from said heat exchanger; and

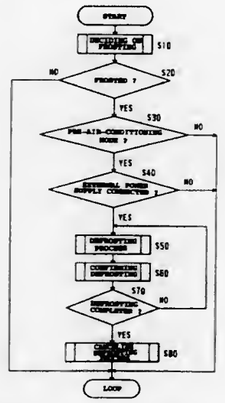
adjusting the concentration of said absorbent-enriched solution to prevent crystallization of said absorbent.

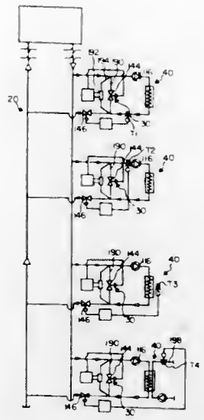
5,586,448

DEFROSTING CONTROL SYSTEM FOR USE IN AN AIR-CONDITIONER IN AN ELECTRIC VEHICLE

Susumu Ikeda; Toshimi Isobe; Atsuo Inoue, all of Isesaki; Akihiro Tajiri, Wako; Masahiro Takagi, Wako; Mitsuru Ishikawa, Wako; Choji Sakuma, Wako, and Nobuyuki Yuri, Wako, all of Japan, assignors to Sanden Corporation, Gunma-ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Jun. 7, 1995, Ser. No. 477,869
Claims priority, application Japan, Jul. 6, 1994, 6-155043
Int. Cl.[6] B60H *1/00*
U.S. Cl. 62—156 **15 Claims**





1. A defrosting control system in a heat-pump air-conditioner for air-conditioning an electric vehicle with a compressor that is electrically actuated by the electric energy stored in a battery on the electric vehicle, comprising:

frosting determining means for determining whether an external heat exchanger of the air-conditioner is frosted;

air-conditioning operation detecting means for detecting whether the air-conditioner is operating in a pre-air-conditioning mode before a driver enters the electric vehicle; and

defrosting means for operating the air-conditioner to defrost the external heat exchanger by causing the external heat exchanger to function as a heat radiator when the external heat exchanger is determined as being frosted by said frosting determining means and the air-conditioner is determined as operating in the pre-air-conditioning mode by said air-conditioning operation detecting means.

5,586,449

HYDRONIC INTERFACE SYSTEM, METHOD AND APPARATUS

Gene Krist, c/o BRDG-TNDR Corporation 2550 NW. Fourth Ct., Ft. Lauderdale, Fla. 33311

Continuation-in-part of Ser. No. 87,425, Jul. 2, 1993, Pat. No. 5,347,825. This application Sep. 20, 1994, Ser. No. 309,090
Int. Cl.[6] G05D *23/00;* **F24D** *3/00*
U.S. Cl. 62—179 **3 Claims**

1. Apparatus for coupling a primary loop with a secondary loop for circulating processing fluids therebetween comprising in combination:

a first connection for the feed line of the primary loop and a second connection for the return line of the primary loop;

a third connection for the feed line of the secondary loop and a fourth connection for the return line of the secondary loop;

a crossover line coupling the four connections;

first valve means for controlling the flow through the primary loop;

first sensor means responsive to the temperature associated with the secondary loop to control the first valve means, the first sensor means including a supply temperature sensor and a return temperature sensor;

second valve means in the path of flow through the crossover line; and

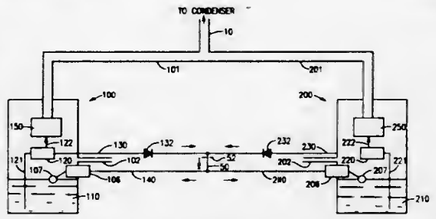
second sensor means responsive to the flow of the process fluid across the crossover line to control the second valve means.

5,586,450

PLURAL COMPRESSOR OIL LEVEL CONTROL

Paul S. Tollar, Liverpool, and Russell E. Wood, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 25, 1995, Ser. No. 533,491
Int. Cl.[6] F25B *31/00*
U.S. Cl. 62—192 **3 Claims**



1. A refrigeration circuit containing condensing means, expansion means and evaporator means, a plurality of compressors having a common discharge for supplying hot compressed refrigerant to said condensing means and a common return for returning refrigerant to said compressors:

each of said plurality of compressors having a discharge line connected to said common discharge, suction line connected to said common return, an oil supply in the compressor having an oil level, an oil pump connected to the oil supply and having an excess capacity, lubrication delivering means for delivering oil from the oil pump to the compressor for lubrication and means for bypassing excess oil from the oil pump out of the compressor, oil return means including means for controlling the oil return means responsive to the oil level;

each of said means for bypassing excess oil including bypass oil delivery means connected to a common line;

said common line branching into a plurality of oil return lines respectively connecting with each of said plurality of com-

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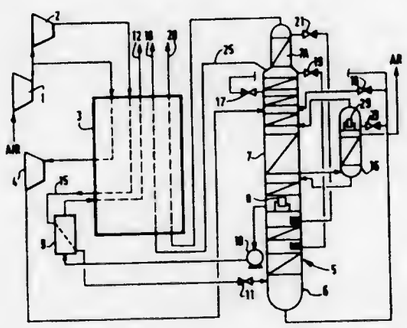
pressors through the respective oil return means whereby bypassed excess oil is returned to each of said plurality of compressors responsive to the respective oil level in each compressor.

5,586,451

PROCESS AND INSTALLATION FOR THE PRODUCTION OF OXYGEN BY DISTILLATION OF AIR

Yves Koeberle, Le Perreux sur Marne, and Philippe Fraysse, Fontenay aux Roses, both of France, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 10, 1995, Ser. No. 419,441
Claims priority, application France, Apr. 12, 1994, 94 04298
Int. Cl.[6] F25J *3/02*
U.S. Cl. 62—646 **10 Claims**



1. A process for the production of gaseous oxygen under pressure by cryogenic distillation of air in a double column comprising a medium pressure column and a low pressure column, comprising dividing rich liquid from the medium pressure column into first and second liquid fractions, sending all of said first and second liquid fractions in liquid phase to different levels in the low pressure column, and withdrawing impure nitrogen from the low pressure column, both of said different levels being below a level of said withdrawal of impure nitrogen from the low pressure column.

5,586,452

JEWELRY WITH AN INTEGRAL HINGE

Peter Schmid, Leeds, United Kingdom, assignor to Abbeycrest Plc., Leeds, England

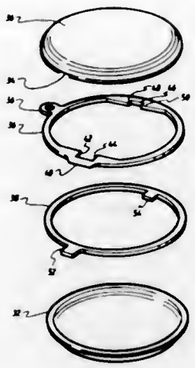
Continuation of Ser. No. 970,377, Nov. 2, 1992, abandoned.
This application Feb. 4, 1994, Ser. No. 192,303
Claims priority, application United Kingdom, Nov. 6, 1991, 9123539
Int. Cl.[6] A44C *15/00*
U.S. Cl. 63—19 **10 Claims**

1. An item of jewelry comprising:

(a) first and second blanks in the form of endless rims, and defining thereby respective first and second endless rims;

(b) means on said first endless rim defining over a length of said first endless rim, an integral hinge pin; and

(c) an integral tongue on said second endless rim which wraps around the said length of said first endless rim, said means on said first endless rim being a part of the rim itself whereby said endless rims are connected hingedly together without the need for a separate pintle pin or an additional hinge wire.

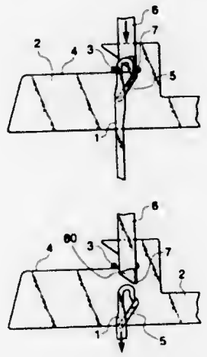


5,586,453

METHOD AND APPARATUS FOR TREATING STITCHES OF KNIT ARTICLES

Alberto Frullini, and Paolo Frullini, both of Via di Brozzi 151/A, 50145 Firenze, Italy

Filed Aug. 24, 1995, Ser. No. 519,115
Claims priority, application Italy, Sep. 7, 1994, FI94A170
Int. Cl.[6] D04B *9/40*
U.S. Cl. 66—148 **26 Claims**



1. A method for removing stitches from needles, the method comprising the steps of:

providing a compound type needle with a latch and a stitch latched in a hook of said needle;

providing a sinker in a closed position with respect to said needle;

lifting said needle with respect to said sinker to move the stitch out and away from said hook and said latch while the stitch is on said needle and in an unlatched condition;

providing a punch means for receiving the stitch from said needle;

moving an end of said punch means into contact with said hook;

lowering said needle with respect to said sinker to move the stitch towards said hook and to close said latch with the stitch being outside said latch and said hook, said latch in a closed position covering said hook and a portion of said punch means, said lowering also moving the stitch off of said needle and onto said punch means;

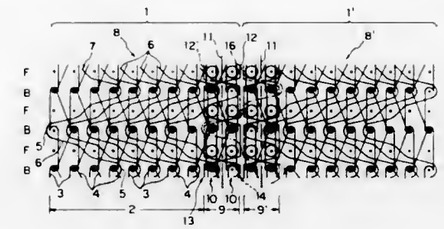
moving said punch means with the stitch away from said needle.

5,586,454

WARP-KNIT TAPE FOR SLIDE FASTENER

Yoshio Matsuda, and Hidenobu Kato, both of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

Filed Aug. 25, 1995, Ser. No. 519,403
Claims priority, application Japan, Aug. 26, 1994, 6-202259
Int. Cl.[6] A44B *19/34;* **D04B** *21/00*
U.S. Cl. 66—193 **5 Claims**



1. A warp-knit tape, for a slide fastener, comprising:

(a) a web portion having a ground knit structure; and

(b) an element-mounting edge portion connected to and extending along said web portion;

(c) said element-mounting edge portion being composed of a reinforcing core, double chain stitches knitted of two knitting yarns respectively extending on opposite sides of said reinforcing core, a weft inlaid structure of a plurality of weft inlaid yarns laid in and extending symmetrically in opposite directions between said double chain stitches on front and back sides, and part of said ground knit structure of said web portion, said double chain stitches forming two wales with said reinforcing core laid therebetween;

(d) said double chain stitches being knitted alternately with the front side and back side of said element-mounting edge portion, said symmetrical weft inlaid yarns being knitted with the front side and back side of said element-mounting edge portion respectively;

(e) said web portion being knitted by knitting needles only on either of the front side or back side.

5,586,455

FLOAT-TYPE CLUTCH FOR AUTOMATIC WASHING MACHINE

Tooru Imai, Tajimi; Hiroshi Nishimura, Seto; Nobuichi Nishimura, Ichinomiya; Masahiro Imai, Tajimi; Kazutoshi Tani, and Takayuki Hirano, both of Seto, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 28, 1995, Ser. No. 412,271
Claims priority, application Japan, Mar. 30, 1994, 6-061301; Mar. 31, 1994, 6-063846
Int. Cl.[6] D06F *23/04;37/40*
U.S. Cl. 68—12.02 **25 Claims**

1. An automatic washing machine comprising:

a hollow outer shaft vertically supported via bearing means on a stationary member to be rotated around a vertical axis thereof, the outer shaft having an upper end;

a rotatable tub for accommodating laundry therein, the rotatable tub having a central bottom coupled to the upper end of the outer shaft so as to be rotated by the outer shaft;

an inner shaft rotatably inserted in the outer shaft with bearing means interposed therebetween, the inner shaft having an upper end projecting from the upper end of the outer shaft;

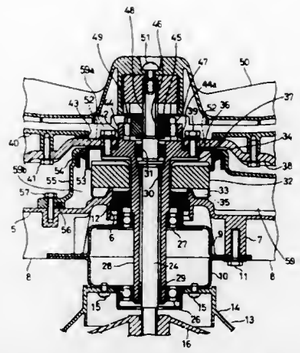
an agitator coupled to the upper end of the inner shaft and disposed in the rotatable tub;

an electric motor disposed at a side of the stationary member for driving the inner shaft;

control means for controlling the motor;

(f) a first float chamber formed around a portion of the inner shaft projecting from the upper end of the outer shaft and communicating with the rotatable tub to be filled with water when the water is supplied to the rotatable tub in a wash step; and

a clutch float disposed in the first float chamber so as to be vertically movable along the inner shaft, the clutch float being movable relative to the rotatable tub, the clutch float being engaged with both of the outer and inner shafts to thereby couple the inner shaft to the outer shaft for transmission of rotation when assuming a first position where the clutch float is escaped from buoyancy, the clutch float being moved from the first position to a second position when subjected to buoyancy, thereby decoupling the inner shaft from the outer shaft.

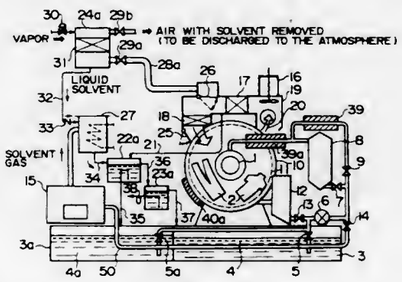


5,586,456

APPARATUS FOR WASHING AND DRYING CLOTHES

Hiroyuki Takagawa; Yasuhiro Tsubaki; Yoshio Miyairi; Toshio Hattori, and Haruo Hagiwara, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 257,295, Jun. 9, 1994, Pat. No. 5,498,266.
This application Sep. 19, 1995, Ser. No. 530,447
Claims priority, application Japan, Jun. 11, 1993, 5-164985; Oct. 28, 1993, 5-270312; Apr. 14, 1994, 6-075557
Int. Cl.[6] D06F *43/08*
U.S. Cl. 68—18 R **7 Claims**



1. A dry-cleaning apparatus for washing and drying clothes with a high boiling point combustible solvent comprising:

a first solvent reserve tank for containing a high boiling point combustible solvent;

a second solvent reserve tank for containing a liquid perfluorocarbon;

a processing tank for washing clothes, selectively connected with solvents reserved in said first and second solvent reserve tanks;

liquid separator means for separating and recovering each solvent used for washing after completion of washing of clothes in said processing tank; and

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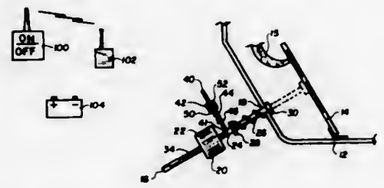
a means for drying clothes in said processing tank.

5,586,457

VEHICLE ANTI-THEFT DEVICE

Manuel L. Keener, P.O. Box 6625, Dothan, Ala. 36302

Filed Dec. 9, 1994, Ser. No. 355,253
Int. Cl.[6] F16H 57/00; G05G 5/00
U.S. Cl. 70—201 13 Claims



1. A partial vehicle disablement system for limiting engine operation to idle speed, by selectively locking the vehicle accelerator pedal against depression, comprising:

an obstructing member movable between obstructing and enabling positions, selectively contacting and completely clearing the accelerator pedal, respectively;

means defining an opening through a vehicle firewall in the vicinity of the vehicle accelerator pedal for enabling said obstructing member to be slidably mounted therethrough, toward and beneath the vehicle accelerator pedal; and

a means for moving said obstructing member selectively to said obstructing and enabling positions, said means for moving said obstructing member being located outside of the vehicle firewall and including:

a motor;

a pinion attached to said motor; and

a rack formed on said obstructing member, said pinion engaging said rack;

whereby,

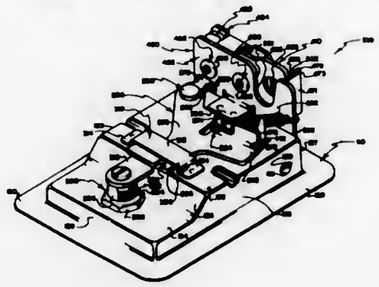
actuation of said motor moves said obstructing member between said enablement position and said obstructing position.

5,586,458

HANDLE OPERABLE ROTARY LATCH AND LOCK

Lee S. Weinerman, Medina, and Scott A. Arthurs, Brunswick, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 510,470, Aug. 2, 1995, Pat. No. 5,564,295, which is a continuation of Ser. No. 145,691, Oct. 29, 1993, Pat. No. 5,439,260. This application Dec. 22, 1995, Ser. No. 577,717
Int. Cl.[6] E05C 3/26
U.S. Cl. 70—208 27 Claims



1. A flush-mountable, handle-operable rotary lock for being mounted as a unit on a closure for releasably retaining the closure in a closed position by latchingly engaging a suitably configured strike formation that is located within relatively close proximity to the rotary lock when the closure is in its closed position, comprising:

a) a flush-mountable handle and housing assembly including:

i) a one-piece, flush-mountable, pan-shaped housing for mounting on a closure adjacent a mounting opening formed in the closure, with the housing having back and side wall portions that cooperate to define a forwardly facing recess, with the housing also having a substantially flat front mounting flange that extends in an uninterrupted manner about a front perimeter of the recess, with a major back wall portion being substantially flat and extending in a back wall plane that generally parallels a front plane in which the mounting flange extends, and with a back wall opening formed through the major back wall portion;

ii) an operating handle configured to be nestable within the recess at a location on the front side of the major back wall portion;

iii) pivot means connecting the operating handle to the pan-shaped housing for pivotal movement between a normal, non-operated position nested with the recess at a location on the front side of the major back wall portion, and an operated position wherein a normally nested portion of the handle projects forwardly from the recess;

b) a rotary latch assembly rigidly connected to the pan-shaped housing, including a rotary latch housing that has:

i) a one-piece, elongate, generally rectangular first housing side plate having opposed end regions near opposite ends of the length thereof, having a first side surface that extends lengthwise between the opposed end regions, and defining a first U-shaped notch that opens through the first side surface at a location near one of the opposed end regions of the first housing side plate;

ii) a one piece, elongate, generally rectangular second housing side plate having opposed end regions near opposite ends of the length thereof, having a second side surface that extends lengthwise between the opposed end regions, and defining a second U-shaped notch that opens through the second side surface at a location near one of the opposed end regions of the second housing side plate, with the first and second side surfaces extending in spaced, substantially parallel relationship, and with the second U-shaped notch being substantially aligned with the first U-shaped notch;

iii) spacer means for extending transversely between, for rigidly connecting with, and for maintaining a substantially parallel relationship between the first and second housing side plates, with the spacer means including a first spacer that extends along a first transverse axis that intersects each of the first and second housing side plates at a location that is relatively near to the other end regions thereof, and with the spacer means also including a second spacer that extends along a second transverse axis that intersects each of the first and second housing side plates at a location that is substantially mid-way between the opposite ends thereof;

c) plural connection means rigidly connecting the rotary latch housing to the pan-shaped housing, including a plurality of tab-like projections formed integrally with a chosen one of the first and second housing side plates, with at least one of the tab-like projections extending along and being rigidly connected to a chosen side wall portion of the pan-shaped housing, and at least another one of the tab-like projections extending along and being rigidly connected to the major back wall portion at a location near where said at least one of the tab-like projections extends along and is rigidly connected to said chosen side wall portion;

d) with the rotary latch assembly additionally including a rotary jaw and a rotary pawl that extend substantially within a common plane located between the first and second housing side plates, with the rotary jaw being connected to the second spacer and being rotatable through a limited range of angular movement about the second transverse axis between latched and unlatched positions but being spring-biased toward its unlatched position, with the rotary pawl being connected to the first spacer and being movable relative to the rotary latch housing about the first transverse axis between jaw-retaining and jaw-releasing positions to selectively release and retain the rotary jaw in its latched position but being spring-biased to move the rotary pawl toward its jaw-retaining position as the rotary jaw moves to its latched position, with the rotary jaw defining a third U-shaped notch that is configured to cooperate with the first and second U-shaped notches to concurrently receive and to latchingly retain within the confines of the first, second and third U-shaped notches a suitably configured strike formation when the rotary latch assembly latchingly engages the strike formation, and with a selected one of the first and second housing side plates being strengthened and enhanced in rigidity adjacent its associated U-shaped notch by the close proximity presence thereto of a transversely extending flange that is formed integrally with said selected housing side plate;

e) an operating arm connected to the major back wall portion for pivotal movement along the rear of the major back wall portion between primary and secondary positions about a pivot axis that extends substantially perpendicular to the major back wall portion, with the operating arm defining three spaced formations, with a first of the three formations being movable adjacent the back wall opening when the operating arm moves between its primary and secondary positions, with a second of the three formations being located generally one side of said pivot axis and being movable adjacent the rotary pawl of the rotary latch assembly to move the rotary pawl to release the rotary jaw from its latched position in response to movement of the operating arm from its primary position to its secondary position, and with a third of the three formations being located generally on an opposite side of said pivot axis and being spaced from the first and second of the three formations and being movable along a path of travel between a first position and a second position in response to movement of the operating arm between its primary and secondary positions;

d) locking means for being connected to the pan-shaped housing and for providing a locking member that is movable into and out of said path of travel to selectively block and permit movement of the operating arm between its primary and secondary positions;

e) projection means for extending through said back wall opening, for being rigidly connected to a selected one of the operating handle and the first of the three formations of the operating arm, and for being engaged by the other of the operating handle and the first of the three formations for establishing a driving connection between the operating handle and the operating arm that will cause the operating arm to move from its primary position toward its secondary position in response to movement of the operating handle from its non-operated position to is operated position, and for blocking movement of the operating handle from its non-operated position to its operated position when the locking member is moved into said path of travel to block movement of the operating arm from its first position to its and second position; and,

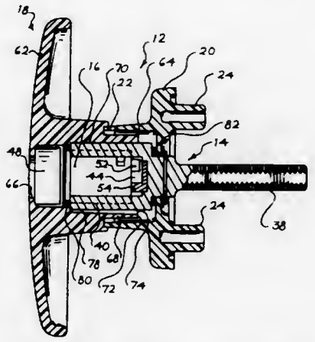
f) first guide means for defining a first passage of limited length paralleling said back plane within which at least a part of the first of the three formations is movable during movement of the operating arm relative to the pan-shaped housing between the primary and secondary positions of the operating arm, and second guide means for defining a second elongate passage of limited length paralleling said back plane within which at least a part of the third of the three formations is movable during movement of the operating arm between the primary and secondary positions of the operating arm, with said first and second passages being configured to assist in confining said relative movement of the operating arm so as to limit such movement to pivotal movement about said axis to help ensure that other movement of the operating arm that might defeat the action of the lock is resisted.

5,586,459

LOCKING HANDLE

Charles E. Bullock, Waukegan, Ill., and Douglas L. Juga, Kenosha, Wis., assignors to A. L. Hansen Mfg. Co., Waukegan, Ill.

Filed May 16, 1995, Ser. No. 441,820
Int. Cl.[6] G05G 5/00
U.S. Cl. 70—224 9 Claims



1. In a locking handle of the type comprising a base mountable to a mounting surface and a handle rotatably mounted to the base, the improvement comprising:

a well formed in the handle, said well communicating with a key opening in a front portion of the handle and a loading opening in a rear portion of the handle;

a shaft mounted in the well via the loading opening to rotate with the handle, said shaft comprising a first part which extends out of the base and a second part which forms a recess adjacent the key opening, said first and second parts of the shaft formed to rotate at all times as a unit;

a lock comprising a key receiving slot and a locking element;

said lock positioned in the recess to rotate in unison with the handle with the key slot aligned with the key opening, said lock dimensioned to pass through the loading opening but not the key opening for assembly, said locking element passing outside of the shaft to releasably engage the base and thereby selectably lock the handle against rotation with respect to the base.

5,586,460

DEVICE WITH PEAK CURRENT LOOP AND PROCESS FOR THE MAGNETIC SHAPING OF METAL PARTS

Erich Steingroever, Bonn, Germany, assignor to Magnet-Physik Dr. Steingroever GmbH, Germany

Filed Apr. 6, 1995, Ser. No. 417,897
Claims priority, application Germany, Oct. 13, 1994, 44 36 615.9
Int. Cl.[6] B21D 26/02
U.S. Cl. 72—56 17 Claims

1. A pulse transformer with a high-current loop for magnetic shaping metal parts with high-energy magnetic pulses, characterized in that said high-current loop is a magnetic field shaper, comprising:

an opening to receive metal parts which are to be shaped;

a slit extending through the material of said high-current loop radially with respect to said opening;

said high-current loop characterized in that it is divided into segments forming said opening and separable along a plane through said opening; intermediate layers between said segments of said high-current loop that form said opening, said intermediate layers consisting of a material that prevent parts from becoming welded together; and means for pressing together said segments of said high-current loop that form said opening.

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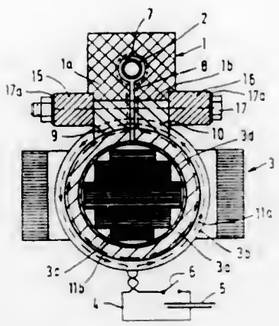
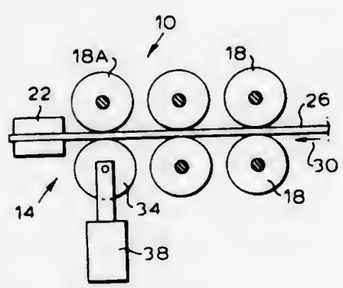


5,586,461

METHODS AND APPARATUS FOR MANUFACTURING HELICAL PRODUCTS

Maurice W. Murphy, Lawrenceville, Ga., assignor to The Morgan Crucible Company plc, Windsor, England

Filed Nov. 4, 1994, Ser. No. 334,136
Int. Cl.[6] B21F *35/02;3/02*
U.S. Cl. 72—137 6 Claims



1. A method of producing a helical device having legs and a bight, comprising the steps of:

a. providing along a first axis an elongated flat strip of material having integrally-formed formed first, second, third, and fourth sections, the first and third sections defining the legs of the device and the second section defining the bight;

b. be knurling the material;

c. passing the first section through adjustable forming rollers to form the first section in the shape of a helix, which forming rollers are separated by a predetermined distance and at least one of which forming rollers defines a longitudinal axis along which the first section travels while being formed in the shape of a helix, the distance between the forming rollers determining the diameter of the helix and the angle between the first axis and the longitudinal axis determining the pitch length of the helix;

d. bending the second section along the longitudinal axis;

e. passing the third section through adjustable forming rollers to form the third section in the shape of a helix;

f. cutting the material between the third and fourth sections; and

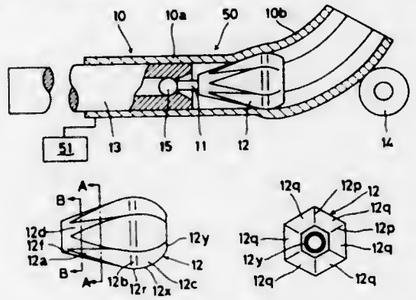
g. thereafter bending the second section.

5,586,462

DEVICE AND METHOD FOR FORMING BENT PIPE OF NON-ANNULAR CROSS-SECTION

Kiyoshi Takeuchi, Toyota; Shin Takeda, Nagoya, and Masao Nakamura, 2-1, Aza Higashiura, Kitayama-cho, Toyohashi city, Aichi-pref., all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, and Masao Nakamura, both of Aichi, Japan

Filed Jan. 31, 1995, Ser. No. 380,947
Claims priority, application Japan, Jan. 31, 1994, 6-009186
Int. Cl.[6] B21D *9/05;* B21C *1/24;* B21B *17/02*
U.S. Cl. 72—150 10 Claims



1. A device for converting a straight pipe having an annular cross-section defined between an inner diameter and an outer diameter into a bent pipe having a non-annular cross-section, comprising:

a round, bar-shaped guide member having a first end portion and a second end portion spaced from the first end portion in the axial direction, said guide member being adapted for mounting slidably with the straight pipe;

a floating member including an expanding portion with a first end thereof being connected to the second end of said guide member in a ball-and-socket joint, said first end having a cross-section in the form of a circle with a diameter less than the inner diameter of said straight pipe, said expanding portion further having a second end with a cross-section formed as a polygon and a maximum diameter larger than the inner diameter of the straight pipe, wherein

a cross-sectional area of said expanding portion along a longitudinal axis of said floating member increases from said first end to said second end having said maximum diameter, an outer surface area of said expanding portion comprising a plurality of adjacent trapezoids positioned to form sides of said polygon in cross-section with adjacent pairs of said polygon sides each defined to form an arcuate corner therebetween with a predetermined radius, the predetermined radius of adjacent polygon sides being defined to progressively decrease from said first end to said second end of said expanding portion;

feeding means for sliding said straight pipe on said guide member toward said floating member such that said straight pipe is brought into engagement with said floating member thereby forming said non-annular cross-section of said straight pipe; and

bending means for bending the resultant pipe by applying a force thereto.

5,586,463

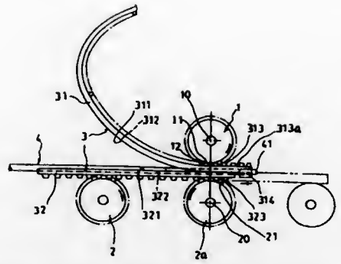
PIPE BENDING DEVICE

Reen-Yuan Sheen, P.O. Box 1-394, Chungho, Taipei Hsien, Taiwan

Filed Aug. 17, 1995, Ser. No. 515,643
Int. Cl.[6] B21D *5/14;* B21B *39/02*
U.S. Cl. 72—166 4 Claims

1. A pipe bending device comprising:

a drive toothed wheel;



a plurality of guide toothed wheels arranged at a same level and oppositely to said drive toothed wheel;

a first guide mold located under said drive toothed wheel and having teeth engaged with said drive toothed wheel;

a second guide mold disposed on said guide toothed wheels and having teeth engaged with said guide toothed wheels;

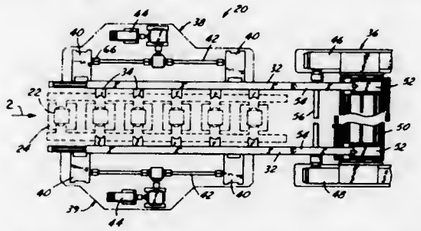
a mandrel adapted to be inserted into a pipe to be bent and having a link at an end thereof, said pipe having an end which will be fastened on an end of said first guide mold in operation.

5,586,464

MODULAR DIE TRANSFER SYSTEM

Boice F. Horde, Westland, and Denver Akers, Lincoln Park, both of Mich., assignors to Livernois Die and Automation, Dearborn, Mich.

Filed Oct. 20, 1995, Ser. No. 546,537
Int. Cl.[6] B21D *43/05*
U.S. Cl. 72—405.16 13 Claims



1. In a die transfer system for transferring workpieces between successive die stations in a stamping press, and including elongated bar means having spaced means for engaging workpieces at successive die stations, first means for reciprocating said bar means longitudinally for transferring workpieces between successive die stations, and second means for reciprocating said bar means horizontally into and out of engagement with workpieces at the die stations and vertically upwardly and downwardly with respect to the die stations, said second means comprising:

at least one drive module coupled to said bar means, drive shaft means coupled to said drive module, and means coupled to said drive shaft means for operating said drive shaft means and said drive module in synchronism with operation of the stamping press, said drive module comprising:

crank arm means, means operatively coupling said crank arm means to said drive shaft means for rotating said crank arm means about an axis parallel to said bar means, cam plate means coupled to said bar means and mounted for movement laterally of said axis both horizontally and vertically with respect to said axis, cam slot means extending along said cam plate means, and cam follower means disposed in said slot means and coupled to said crank arm means,

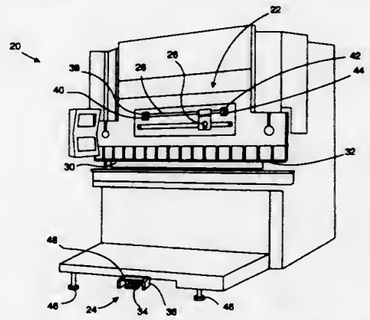
the improvement wherein said slot means includes first and second slot portions lateral to said axis and orthogonal to each other, and an arcuate third portion interconnecting said first and second portions, said arcuate third portion having a constant radius equal to radius of said cam follower means with respect to said crank arm axis, rotation of said drive shaft means and said crank arm means propelling said cam follower means along said first, third and second slot portions in sequence, and thereby driving said cam plate means and said bar means in first and second directions at right angles to said axis and to each other during motion of said cam follower means along said first and second slot portions, and with a dwell at said cam plate means and said bar means during motion of said cam follower means through said third slot portion.

5,586,465

PRESS BRAKE CONTROLLER POSITIONING SYSTEM

Raymond R. Alcini, 195 Mast St., Morgan Hill, Calif. 95037, and Dan E. Ritola, 406 Imboden Rd., Castle Rock, Wash. 98611

Filed Nov. 22, 1994, Ser. No. 344,351
Int. Cl.[6] B21J *13/00*
U.S. Cl. 72—441 23 Claims



1. A controller positioning system for use with a piece of equipment having a user-operated controller having an interface for manually inputting parameters to control the piece of equipment, said piece of equipment having a length, said controller positioning system comprising:

a guide means for guiding said user-operated controller along at least a portion of the length of said piece of equipment,

a powered means for moving said user-operated controller along said guide means,

and a control means for controlling the movement of said user-operated controller along said guide means.

5,586,466

NON-SLIP SLEEVE FOR FLOAT LEVEL SENSOR SHAFT

George A. Steiner, 4425 Harvard Ave., Montreal, Quebec, Canada

Filed Dec. 16, 1993, Ser. No. 168,547
Int. Cl.[6] G01F *23/30*
U.S. Cl. 73—319 4 Claims

1. In a float level sensor wherein at least one float has a vertical linear movement on a shaft with a circular external cross-section, the movement caused by variation in liquid level, the improvement comprising:

a non-stick thin walled sleeve formed of a polytetrafluoroethylene polymer fitting over the shaft, extending for at least the vertical linear movement of the float, the float freely slidable over the sleeve, and

gripping means for retaining the sleeve in a desired position on the shaft.

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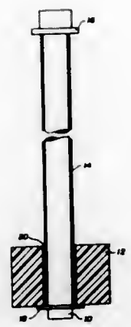
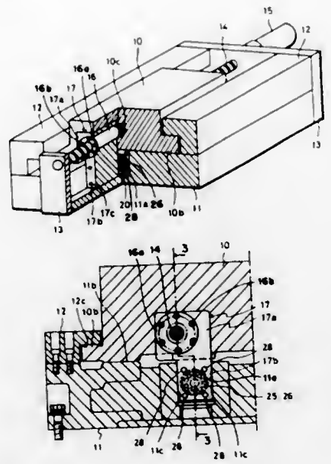
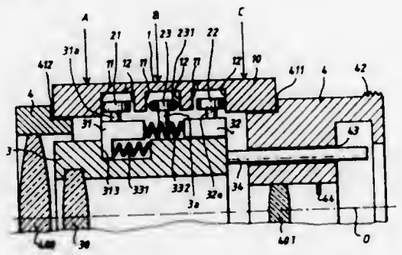




5,586,467
IMPACT PROTECTED CAM DRIVE FREE OF BACKLASH
Uwe Weber, Aalen, Germany, assignor to Carl Zeiss Stiftung, Heidenheim-Brenz, Germany
Filed Mar. 29, 1995, Ser. No. 412,587
Claims priority, application Germany, Apr. 2, 1994, 44 11 516.4
Int. Cl.[6] F16H *25/12*
U.S. Cl. 74—57 **8 Claims**



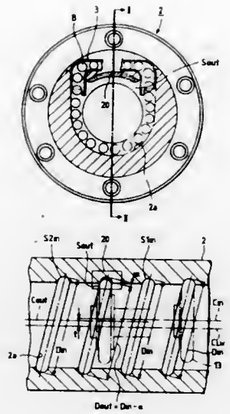
1. A backlash-free cam drive which can be subjected to an impact load, the cam drive comprising:
a cam member having a guide path thereon;
said guide path defining two mutually adjacent cam tracks;
a cam follower unit including first and second contact rollers mounted thereon so as to be resiliently biased relative to each other and against corresponding ones of said cam tracks; and,
an ancillary component mounted thereon so as to be in spaced relationship to said cam tracks in the absence of said impact load and contact engaging one of said cam tracks in response to said impact load on said cam drive;
said cam member including a first material for defining said cam tracks and said ancillary component including a contact part for contact engaging said one cam track; and,
said contact part being made of a second material elastically softer than said first material.

5,586,468
TABLE DRIVING DEVICE
Katsura Tomotaki, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan
Filed Jul. 28, 1994, Ser. No. 282,877
Claims priority, application Japan, Jul. 30, 1993, 5-190576
Int. Cl.[6] F16H *25/24*
U.S. Cl. 74—89.15 **2 Claims**

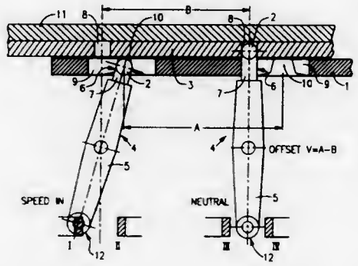
1. A table driving device comprising:
a guide portion with which a part of a table is movably engaged for guiding the table;
a feed screw disposed in parallel with a moving direction of the table;
driving means for rotating the feed screw;
a nut threadedly engaged with the feed screw;
a nut holder having a nut connecting portion connected to the nut and an engaging portion movably engaged with the guide portion, and moving along the feed screw and the guide portion together with the nut in accordance with the rotation of the feed screw; and
a coupling portion for coupling the engaging portion of the nut holder to the part of the table that is engaged with the guide portion through a ball that can roll in a plane perpendicular to the moving direction of the table.

5,586,469
OUT-OF-CIRCUIT BALL PREVENTING STRUCTURE FOR BALL SCREW NUT
Hidenaga Mitani, and Hiroshi Morimoto, both of Gunma, Japan, assignors to NSK Ltd., Tokyo, Japan
Filed Mar. 15, 1995, Ser. No. 404,443
Claims priority, application Japan, Mar. 15, 1994, 6-044306
Int. Cl.[6] F16H *25/22*
U.S. Cl. 74—459 **1 Claim**

1. A ball screw nut adapted to having balls loaded therein, comprising:
a plurality of ball circulation circuits including a first in-circuit groove and a second in-circuit groove for circulating the balls, and an out-of-circuit groove disposed between a first ball circulation circuit and a second ball circulation circuit of said plurality of balls for circulating no balls in an inner circumferential surface of the ball screw nut,
wherein the out-of-circuit groove has an oblique diameter that is smaller than that of the first and second in-circuit grooves.

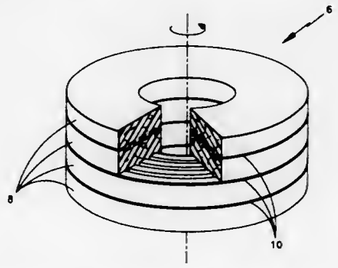


5,586,470
GEAR-CHANGING DEVICE FOR A GEAR BOX, IN PARTICULAR A MOTOR VEHICLE GEAR BOX
Gerhard Bailly; Detlef Baasch, and Unal Gazyakan, all of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AB, Friedrichshafen, Germany
PCT No. PCT/EP93/02920, § 371 Date Mar. 31, 1995, § 102(e) Date Mar. 31, 1995, PCT Pub. No. WO94/10484, PCT Pub. Date May 11, 1994
PCT Filed Oct. 22, 1993, Ser. No. 411,702
Claims priority, application Germany, Oct. 28, 1992, 42 36 336.5
Int. Cl.[6] F16H *63/36*
U.S. Cl. 74—477 **6 Claims**



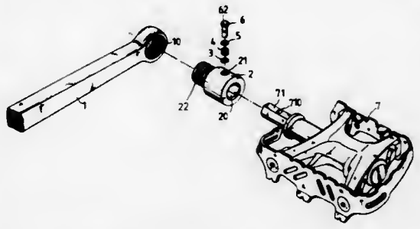
1. A gear-changing device for a transmission comprising:
a slider-crank mechanism (4) comprising a plurality of oscillating cranks (5) each being operably connected to a slide rod (1);
one end of each of said plurality of oscillating cranks (5) supporting a coupling mechanism (6) while an opposite end of each of said plurality of oscillating cranks (5) communicating with a switching element (12);
said slide rod (1) having a plurality of driving apertures (10) formed therein for accommodating said coupling mechanisms (6) when in a driving position;
a housing having a plurality of rest apertures (8) formed therein for accommodating said coupling mechanisms (6) when in a rest position; and
each of said plurality of switching elements (12) being movable, via the slider-crank mechanism (4), from a stationary position to a switching position in such a manner that the stationary position is urged by said coupling mechanism (6) and a driving position is achieved via the slide rod (1);
wherein a spacing distance (B) between the rest apertures (8) formed in the housing (11) is different from a spacing distance (A) between driving apertures (10) formed in the slide rod (1).

5,586,471
ENERGY STORAGE FLYWHEEL DEVICE
Vincent C. Nardone, South Windsor; Mark S. Thompson, Vernon, and Thomas G. Meyer, Lebanon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 128,319, Sep. 29, 1993, Pat. No. 5,452,625.
This application Jun. 7, 1995, Ser. No. 487,878
Int. Cl.[6] F16F *15/30*
U.S. Cl. 74—572 **15 Claims**



1. An energy storage flywheel device, comprising:
(a) at least one annular shaped composite section, and,
(b) at least one annular shaped insert having a specific radial strength substantially greater than the composite section's specific radial strength, wherein the insert and composite section are shaped to form interlocking features that provide a mechanical bond between the insert and composite section, wherein the insert comprises a monolithic metal selected from the group consisting of Al, Al alloys, Ti, Ti alloys, Ni, Ni alloys, and steel,
wherein the composite section, and the insert are alternately stacked along a common axis such that they have a common axis of rotation and are bonded to each other sucb that radial load transfers between the composite section and insert.

5,586,472
DETACHABLE BICYCLE PEDAL MOUNTING STRUCTURE
Wen-Hwa Lin, No. 5, Ming Shen Rd., Ta Chia Chen, Taichung Hsien, Taiwan
Filed Aug. 31, 1995, Ser. No. 522,078
Int. Cl.[6] B62M *3/08*
U.S. Cl. 74—594.1 **1 Claim**



1. A detachable bicycle pedal mounting structure comprising a crank having a screw hole at one end, a pedal having a spindle of hexagonal cross section, and a connector having a cylindrical

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shape with an axis, first and second ends arranged along said axis, a stepped hole radially extending from said axis, and a lock means mounted in said stepped hole for locking said spindle within said connector and preventing rotation of said spindle relative to said connector and said crank,

said first end of said connector is a screw rod threaded into said screw hole of said crank and said second end of said connector is a hexagonal coupling hole receiving said spindle of said pedal; said stepped hole has a cylindrical upper hole, a cylindrical lower hole below said upper hole, and a step between said upper hole and said lower hole; a diameter of said lower hole is smaller than a diameter of said upper hole,

said lock means including a locating bolt mounted in said stepped hole of said connector and tightly received in a locating hole of said spindle when locking said spindle in place; a head with a top and a side, a shank having an annular groove and extending from said head, a clamp secured in said annular groove of said locating bolt, a packing ring mounted around said shank of said locating bolt underneath said head, a spring mounted around the shank of said locating bolt and arranged between said packing ring and said clamp for providing a downward bias to said clamp and forcing said shank of said locating bolt into the locating hole of said spindle of said pedal, and a finger rod rotatably mounted in said head; said finger rod arranged at said side of said head when said spindle is locked in place and rotating to above said top of said head for pulling said locating bolt out of said stepped hole of said connector by hand.

5,586,473

INTEGRATED NEEDLE FOR PERMANENT PIGMENT APPLICATOR

Kuei C. Chou, Taipei, Taiwan, assignor to Mei-Chi-Na Beauty International, Inc., Irvine, Calif.

Filed Jul. 20, 1994, Ser. No. 277,677

The portion of the term of this patent subsequent to Jul. 26, 2013, has been disclaimed.

Int. Cl.[6] B43K *5/00*

U.S. Cl. 81—9.22 **22 Claims**

1. An integrated needle for use with a permanent pigment applicator device having a needle coupler that is coupled to a needle drive mechanism, the integrated needle comprising:

a needle having an elongated shaft portion and a head at a top end; and

an attachment piece that receives the needle and is detachably and coaxially coupled to the needle coupler for detachment after each use, wherein the attachment piece includes a head recess that holds the needle head, thereby preventing longitudinal movement of the needle head in the needle chamber;

wherein the head of the needle is hooked and the head recess is adapted to receive the hooked head of the needle and hold the needle head against longitudinal movement.

5,586,474

TORQUE TRANSFER TOOL

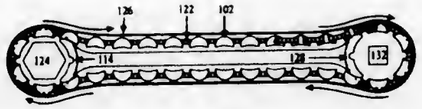
David R. Lund, Charleston, S.C., assignor to Victory in Jesus Ministries, Inc., Summerville, S.C.

Continuation-in-part of Ser. No. 75,787, Jun. 14, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 284,080

Int. Cl.[6] B25B *17/00*

U.S. Cl. 81—57.3 **30 Claims**

1. A torque transfer device, comprising:



a. a continuous loop direct drive means comprising a plurality of alternating spacers and links which are connected by a continuous cable which extends through each of said links and spacers;

b. a first drive gear and a second drive gear, each comprising an orifice about a circumference thereof which is of sufficient width to allow protrusion there through of the spacers of said direct drive means and in which are defined a plurality of voids of sufficient size to allow protrusion there through of the links of said direct drive means, said voids located around said circumference in such manner that each ink of said direct drive means enters one void as said direct drive means passes through each of said drive gears; and

c. a housing in which said first drive gear and said second drive gear are present;

wherein said direct drive means provides communication between said first drive gear and said second drive gear, and wherein a drive means causes rotation of said first drive gear and said direct drive means causes, in turn, rotation of said second drive gear.

5,586,475

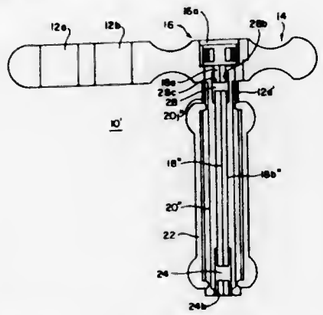
RACHETING TYPE TOOL HAVING FREE WHEELING SLEEVE TO FACILITATE USE

Jeffrey W. Wenner, 520 Singley Ave., Runnemede, N.J. 08078

Filed Feb. 7, 1995, Ser. No. 385,108

Int. Cl.[6] B25B *13/46;23/16*

U.S. Cl. 81—60 **6 Claims**



1. Hand tool comprising:

an annular-shaped hollow main body;

an elongated torquing handle integral with said main body having a hollow interior portion and extending substantially at right angles to a longitudinal axis of said hollow main body;

adjustable ratcheting means arranged within a cavity in said main body adjacent to said torquing handle;

an operating rod extending along the hollow interior of said main body and having an upper end joined to said ratcheting means;

means in said main body for permitting substantially free rotation of said operating rod relative to said main body while maintaining a longitudinal axis of said operating rod substantially coaxial with a longitudinal axis of said main body;

said main body having an open end remote from said torquing handle;

coupler means for releasably coupling tool tips to a lower end of said operating rod, said tool tips extending through said open end;

an elongated, cylindrical-shaped guide sleeve being rotatably mounted about an outer periphery of said main body; and

said main body including means for rotatably mounting said sleeve to said main body while preventing movement of said sleeve in a direction of said longitudinal axis, enabling said hand tool to be rotated by said torquing handle while said guide sleeve is gripped by an operator's hand to maintain the hand tool in alignment with a member to be rotatably driven by the hand tool;

said main body is divided into a first body portion having a first axial length and a second body portion having a second axial length greater than said first axial length releasably detachable to said first body portion;

said operating rod being divided into a first operating rod portion having a first axial length and a second operating rod portion of a second axial length greater than the axial length of said first operating rod portion;

said first operating rod portion being coupled to said ratcheting means; and

second coupler means for releasably coupling said first operating rod portion to said elongated operating rod portion.

5,586,476

PROCESS AND DEVICE FOR MACHINING BARS, TUBES OR TUBE BLANKS

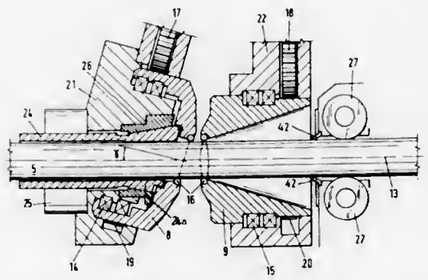
Karl-Joseph Esser, Mönchengladbach, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed May 10, 1995, Ser. No. 438,348

Claims priority, application Germany, May 10, 1994, 44 16 771.7

Int. Cl.[6] B23B *5/08;5/12*

U.S. Cl. 82—1.11 **11 Claims**



1. A process for machining an elongate work piece, comprising the steps of: holding the work piece in a non-rotatable manner, cutting the work piece on its periphery and along its length with a metal cutting device including at least one die having cutters; and simultaneously continually moving the die and the work piece relative to one another in a longitudinal direction of the work piece, the cutting step including rotating two directly adjacent dies concentrically around the work piece on two different planes that are inclined toward a common longitudinal axis of the work piece in directions offset to one another by 90 and simultaneously machining two areas of the work piece surface that are located opposite to one another with the cutters.

5,586,477

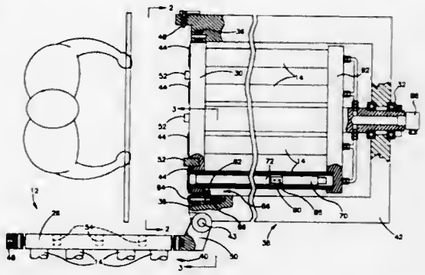
BAR STOCK FEEDER METHOD AND APPARATUS HAVING SEPARABLE GUIDE TUBE SECTIONS

Kirt M. Babuder, Euclid; Douglas A. Joseph, Concord Township; Donald Pistoor, Willoughby Hills, and L. Joseph Stupica, Euclid, all of Ohio, assignors to Devlieg-Bullard, Inc., Westport, Conn.

Continuation of Ser. No. 107,946, Aug. 17, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 557,379

Int. Cl.[6] B23B *15/00*

U.S. Cl. 82—126 **19 Claims**



1. Apparatus for aligning and feeding bar stock to a head stock of a multiple spindle lathe, said apparatus comprising:

a plurality of parallel guide tubes for supporting pieces of bar stock for movement toward the head stock, each of the parallel guide tubes comprising a first elongated tube section and a second elongated tube section separable from the first elongated tube section along a plane transverse to a longitudinal axis of the guide tube to allow insertion of the bar stock into one of the guide tubes and a seal for sealing each tube at an interface between the first and second elongated tube sections;

a plurality of piston assemblies, each fitted to slide inside a respective one of said guide tubes for engaging one end of a corresponding piece of said bar stock and pushing said piece toward said head stock;

fluid supply means for delivering fluid under pressure to the inside of said guide tubes for moving said piston assemblies;

a first support member and a second support member separable from the first support member, the first section of each of the guide tubes supported in the first support member and the second section of each of the guide tubes supported in the second support member, one of said first and second support members being moved with respect to the other support member to separate the first and second sections of all of said guide tubes as a group to permit reloading of bar stock into any one of the first sections of said tubes with said piston assemblies being in a retracted position within the second sections of their respective guide tubes.

5,586,478

CENTERING DEVICE HAVING WORK REST CONTROL RESPONSIVE TO CARRIAGE MOVEMENT

Teruo Hoshioo, Gifu-ken, Japan, assignor to Dainichi Kinzoku Kogyo Co., Ltd., Osaki, Japan

Division of Ser. No. 237,149, May 3, 1994, Pat. No. 5,517,886. This application Mar. 20, 1996, Ser. No. 618,565

Int. Cl.[6] B23B *31/00;* **B23Q** *7/00;3/16*

U.S. Cl. 82—133 **8 Claims**

1. A centering device for use with a lathe having a bed, a head stock and a tail stock for holding a work therebetween, a carriage reciprocally movable in a longitudinal direction of the bed, and a tool box having a cutting tool mounted thereon, comprising:

a plurality of work rests disposed along the longitudinal direction of the bed, each of said work rests being movable

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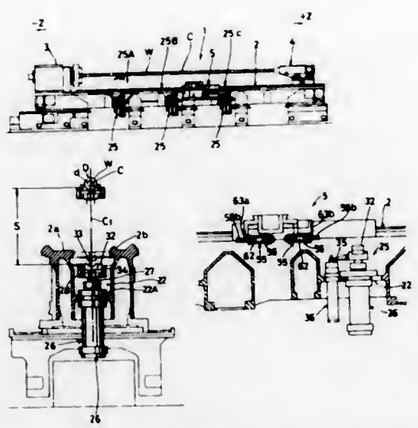


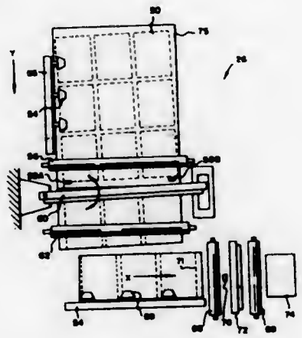
between a first position for supporting the work and a second position spaced from the work; and

control means associated with said work rests for controlling movement of each of said work rests between said first position and said second position in response to the movement of said carriage;

each of said work rests including piston-cylinder means having a piston operable by a pressurized fluid controlled by said control means to be vertically moved between said first position and said second position;

said control means being operable to control the pressurized fluid of said piston in such a manner that an amount of the pressurized fluid is reduced to lower the moving speed of said piston when said piston is moved from said second position to a position adjacent said first position.

5,586,479
CUTTING APPARATUS FOR CUTTING AN IMAGE FROM A RECEIVING SHEET
Carl W. Roy, Spencerport, and Paul E. Tschiderer, Geneseo, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 10, 1993, Ser. No. 29,257
Int. Cl.[6] B23Q *15/26;* **B26D** *5/20;5/38;* **G01D** *15/00*
U.S. Cl. 83—74 **4 Claims**



1. Cutting apparatus capable of cutting a rectangular image, skewed relative to a receiver sheet on which the image is located, from the receiver sheet such that edges of the image are essentially parallel with respective edges of the receiver sheet, comprising:

a first cutter;

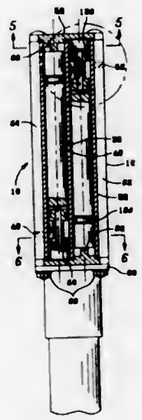
a sensor device for detecting an edge of an image located on a receiving sheet;

means, responsive to said sensor device, for aligning said first cutter and said edge of said image such that said first cutter can cut said receiver sheet essentially parallel to said edge of said image;

means for edge registering an edge of the receiving sheet cut by said first cutter; and

a second cutter positioned to cut said receiving sheet perpendicular with said edge cut by said first cutter.

5,586,480
PNEUMATIC MOTOR
Richard K. Gardner, Montpelier, Ohio, assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Feb. 20, 1996, Ser. No. 604,147
Int. Cl.[6] F01B *7/20;* **F15B** *11/08*
U.S. Cl. 91—169 **12 Claims**



1. A pneumatic motor, comprising:

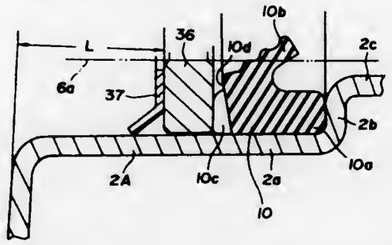
a) a motor body having a piston chamber with opposed chamber ends, at least two valve chambers, inlet means for flowing a pressurized fluid into the piston chamber and each of the at least two valve chambers, outlet means provided in the housing for exhausting the pressurized fluid from the piston chamber and each of the at least two valve chambers;

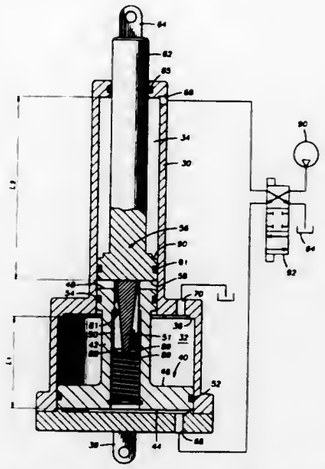
b) a three-way valve member adapted to be located in each of the at least two valve chambers, said valve members having at least one open end and at least one port formed along the valve member body;

c) at least one spool member located in one of said valve chambers, each spool member having a first end adapted to be located in the open end of the valve member, said spool members adapted to be movable in a first direction relative to the valve member to permit pressurized fluid to be supplied to the piston chamber and also in a second direction relative to the valve member to permit the pressurized fluid in the piston chamber to be exhausted from the chamber; and

d) a piston movable in a reciprocating manner in the main chamber in response to movement by the spools relative to the three-way valve members.

5,586,481
APPARATUS FOR PREVENTING DISENGAGEMENT OF SEAL MEMBER IN A BOOSTER
Makoto Watanabe, Saitama-ken, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan
Filed Dec. 20, 1994, Ser. No. 359,575
Claims priority, application Japan, Jan. 28, 1994, 6-026085
Int. Cl.[6] F15B *9/10*
U.S. Cl. 91—376 R **9 Claims**





1. A booster comprising:

a shell including a stepped tubular portion which extends axially rearward from a rear end face of the shell and has a step formed therein, the stepped tubular portion having a greater diameter forwardly of the step,

a reciprocable valve body disposed within the shell and including a tubular terminal end which projects axially rearward through the stepped tubular portion,

a bearing disposed within the portion of the stepped tubular portion which has the greater diameter for slidably supporting the tubular terminal end of the valve body,

an annular seal member disposed within the portion of the stepped tubular portion having the greater diameter so as to be held sandwiched between the step and the bearing in sealing engagement with the tubular terminal end to provide a seal between the stepped tubular portion and the tubular terminal end of the valve body, the seal member having an end face, and the bearing having an end face facing toward the end face of the seal member in a mutually opposing relation, each of the mutually opposing end faces being defined by a radially outer region and a radially inner region; and

means for preventing disengagement of the seal member comprising a projection portion disposed on one of the mutually opposing end faces of the seal member and the bearing in the radially outer region of said one of the mutually opposing end faces for engagement with the other of the mutually opposing end faces, the radially inner regions of the mutually opposing end faces being circumferentially continuously spaced apart and out of contact with one another by a circumferentially continuous space radially extending inwardly from the radially inner side of said projection portion to the radially inner edge of at least one of said opposing end faces.

5,586,482
TWO-STAGE FLUIDIC ACTUATOR
W. Burt Leonard, Rt. 1, Box 254, Waller, Tex. 77484
Filed Aug. 25, 1995, Ser. No. 519,540
Int. Cl.[6] F15B *11/036*
U.S. Cl. 91—519 **5 Claims**

5. A two-stage fluidic actuator, comprising:

a dual-chamber cylinder body, said cylinder body including a power chamber having a first length that opens into a superjacent coaxial extender chamber having a second length that is greater than said first length, the internal diameter of said extender chamber being a pre-selected fraction of the internal diameter of said power chamber;

a power piston mounted for reciprocating motion in said power chamber, a reduced-diameter portion of the power piston reaching into a portion of said extender chamber, the power piston defining posterior, intermediate and anterior faces and having a longitudinal bore therethrough;

an extender piston mounted in said extender chamber, said extender piston including a piston rod and adapted for executing reciprocating strokes of desired incremental lengths independently of said power piston, said extender piston having posterior and anterior faces, the posterior face of the extender piston being exposed to the anterior face of the power piston;

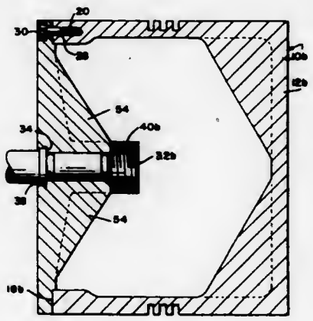
a spring-loaded throttling plunger slidingly mounted in said longitudinal bore for metering the volumetric flow rate of pressurized fluid therethrough against the posterior face of said extender piston as a function of the incremental stroke length thereof;

a first port in said cylinder body for providing fluid communication with the posterior face of the power piston;

a breather port in said cylinder body in fluid communication with the intermediate face of the power piston; and

a second port in said cylinder body for providing fluid communication with the anterior face of the extender piston.

5,586,483
PISTON AND ROD ASSEMBLY
Andrew L. Sine, Lawrenceville, Pa., assignor to Dresser-Rand Company, Corning, N.Y.
Filed Aug. 23, 1995, Ser. No. 518,630
Int. Cl.[6] F16J *1/00*
U.S. Cl. 92—255 **6 Claims**



1. A piston and rod assembly, comprising:

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a hollow piston, having (a) an axis, and (b) an opening formed in one axial end thereof, with (c) an annular ledge rimming said opening; wherein

said ledge has a given plurality of tapped bores formed therein; and

an annular hub, also having the same, given plurality of bolt holes formed therein;

said hub having a circumferential surface which pilotingly receives said piston opening thereabout; and

fasteners set in said holes and fastened in said bores securing said hub to said ledge;

a piston rod, having a prominent shoulder formed thereon, and being threaded at one end thereof; wherein

said hub has (a) a throughgoing bore which pilotingly receives said piston rod therein, and (b) a rim for seating thereof against said shoulder; and

a nut threadedly torqued onto said one end of said rod and fastening said rim of said hub against said shoulder; wherein

said hub has a plurality of radially disposed, rigidizing ribs.

5,586,484

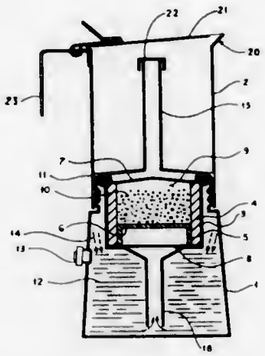
EXPRESSO COFFEE MAKER

Pietro Piazza, 11 Catherine Dr., Prospect, Conn. 06712

Filed Oct. 25, 1994, Ser. No. 344,847

Int. Cl.[6] A47J *31/24*

U.S. Cl. 99—287 **6 Claims**



1. An improved expresso coffee maker comprising an interlocking assembly of four components, the first of said components being an upper brewed coffee holder, the second of said components being a lower water heating container, the third of said components being a coffee grounds holder located between said upper brewed coffee holder and said lower water heating container, the fourth component being a piston, said piston being located within said coffee grounds holder to form a coffee brewing assembly, the external dimensions of said piston closely complying with the internal dimensions of said coffee grounds holder, said coffee brewing assembly having a hollow stem which extends from its base; said improved expresso coffee maker being formed by threadably assembling said upper brewed coffee holder, said coffee brewing assembly and said lower water heating container to effect an hermetic seal between said components.

5,586,485

COFFEE MACHINE

Heinrich Baumann, Solingen, Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Germany

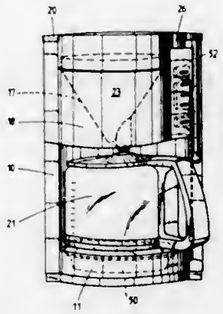
PCT No. PCT/EP94/02685, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO95/05109, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 11, 1994, Ser. No. 416,694

Claims priority, application Germany, Aug. 12, 1993, 9312009 U

Int. Cl.[6] A47J *31/10*

U.S. Cl. 99—295 **5 Claims**



1. In a coffee machine with a water reservoir located in a main housing, a heating device having electric regulating devices, a beverage collecting vessel which can be placed on a housing base, a coffee brewing housing which is arranged above the beverage collecting vessel, mounting means for connecting said coffee brewing housing to said main housing to enable a swiveling of said coffee brewing housing out of the main housing and manually actuated hold-back means for securing said coffee brewing housing in a working position at said main housing, a spring being provided for biasing said hold-back means towards a locking position, the improvement comprising:

a push bar;

said hold-back means being coupled with said push bar which acts on the coffee brewing housing in the swiveling out direction; and

means at the main housing for guiding said push bar.

5,586,486

AUTOMATED DEEP FRYER

John S. Nitschke, Perrysburg, and Daniel B. Kuhary, Whitehouse, both of Ohio, assignors to Vend-It Corporation, Perrysburg, Ohio

Continuation-in-part of Ser. No. 190,866, Feb. 1, 1994, Pat. No. 5,367,949. This application Nov. 23, 1994, Ser. No. 344,151

Int. Cl.[6] A47J *37/00;37/12*

U.S. Cl. 99—330 **56 Claims**

1. An automated deep fryer comprising:

a refrigerated food storage compartment connected with a portion controller and food dispenser;

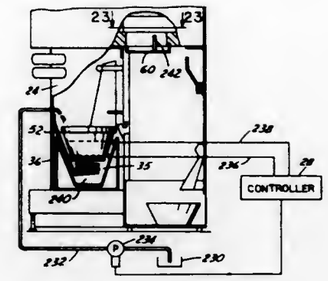
a cooking chamber isolated from the storage compartment, the cooking chamber including a food basket mounted for movement to a variety of preselected positions;

a control for programmed dispensing, preparation and serving of a preselected portion of food in response to an operator's input; and

an air purifier connected with the cooking chamber, said air purifier including

a fan for extracting gases from the cooking chamber, and

a cold plate having a generally smooth surface over which the fumes from the cooking chamber travel, the cold plate being interposed between the fan and the cooking chamber,



5,586,487

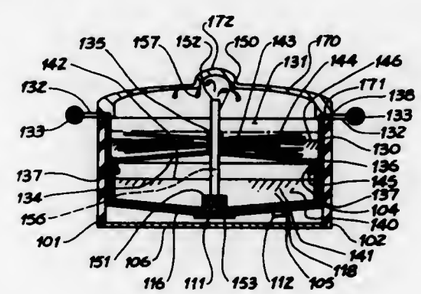
PASTA PERCOLATOR

Francis E. Marino, 9 Hazeltine Rd., Upton, Mass. 01568

Filed May 22, 1995, Ser. No. 446,249

Int. Cl.[6] A47J *27/04;27/06;27/18;27/21*

U.S. Cl. 99—330 **17 Claims**



1. An electrical pasta cooking device comprising;

an electrical heater,

a first compartment for containing water in thermal communication with said electrical heater, and having a lower water level and a first upper water level,

a second compartment for containing pasta, having a cooking level and having a bottom surface disposed below said cooking level and above said first upper water level, said bottom surface including one or more drainage holes therethrough, said one or more drainage holes adapted to allow a down-flow of water therethrough,

a conduit for providing fluid communication from said first compartment at said lower water level to said second compartment above said cooking level,

a third compartment for containing water and having a second upper water level disposed below said bottom surface, and adapted for receiving water from said drainage holes,

a control to establish a cooking period, and to energize said heater during said cooking period and to reduce energization of said heater after said cooking period, and wherein

water within said first compartment is heated by said energized heater during said cooking period,

said heated water up-flows by percolation from said first compartment, through said conduit and into said second compartment above said cooking level, cooks pasta within said second compartment, and down flows through said drainage holes to said third compartment after said cooking period to drain said pasta.

5,586,488

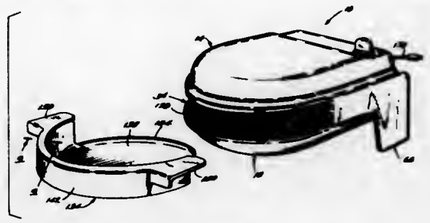
PORTABLE PIZZA OVEN

Simon Y. Liu, West Bend, Wis., assignor to Americorp Inc., West Bend, Wis.

Filed Oct. 3, 1995, Ser. No. 538,751

Int. Cl.[6] A47J *37/00;37/08*

U.S. Cl. 99—331 **21 Claims**



1. A portable pizza oven comprising

a fixed upper casing,

a fixed lower casing, the upper and lower casings defining therebetween an opening,

an upper heater assembly located within and fixed to the upper casing,

a lower heater assembly located within and fixed to the lower casing, so as to define a cooking chamber which is located between the heater assemblies and which is accessible via the opening, and

a pan assembly insertable into and removable from the cooking chamber, the pan assembly including a tray and a handle fixed to the tray, such that, when the pan assembly is inserted into the cooking chamber, the handle closes the opening, thereby closing the cooking chamber,

wherein said upper casing includes a circular dome-like portion, a rectangular portion, and vertical side walls extending downwardly from the circular and rectangular portions, and wherein said lower casing includes a circular dome-like portion, a rectangular portion, and vertical side walls extending upwardly from the circular and rectangular portions of the lower casing, the side walls of the upper and lower casings defining therebetween the opening.

5,586,489

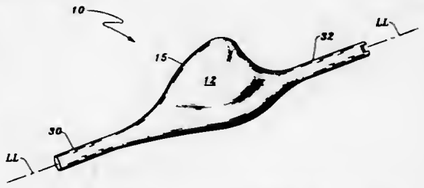
METHOD AND APPARATUS FOR THE PREPARATION OF FOWL

Robert L. Fraga, 886 Cardoza, Tulare, Calif. 93274

Filed Oct. 4, 1995, Ser. No. 539,309

Int. Cl.[6] A47J *37/04;* **A22C** *7/00*

U.S. Cl. 99—419 **13 Claims**



1. Heat transfer member for the preparation of fowl which has been dressed out in such a manner as to leave an interior cavity defined by an interior wall, comprising:

a heat transfer member; said heat transfer member having a longitudinal axis; said heat transfer member including a bulbous element formed about said longitudinal axis in asymmetrical fashion such that the bulbous element is formed with an exterior surface defining a shape which substantially conforms to the shape of the interior cavity of the fowl, said exterior surface of said heat transfer member adapted to make

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heat transfer contact with substantially all of the interior wall of the cavity of the fowl,

a heated environment;

means within said heated environment for the controlled application of heat to said heat transfer member so as to cause the heat to be uniformly transmitted to the interior wall of the fowl to thereby initially sear in juices and thereafter continue to apply heat thereto to cook the fowl from the interior, as well as the exterior, thereof.

5,586,490

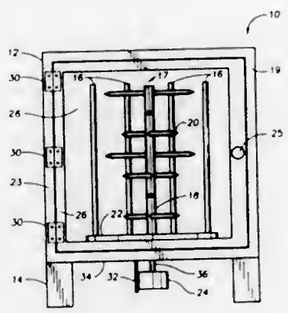
COOKING DEVICE

Shukri T. Saman, 4712 David Dr., Kenner, La. 70065

Filed Jun. 30, 1995, Ser. No. 497,389

Int. Cl.[6] A47J *37/04*

U.S. Cl. 99—421 R **12 Claims**



1. A cooking device comprising:

an insulated housing defining a cooking cavity therein having a front opening;

a radiant heat source disposed within the cooking cavity and positioned adjacent a rear wall of said housing;

a rotating vertical support having a first end, centered in said housing;

a plurality of rigid elongated skewers aligned along the length of said vertical support and disposed horizontally therethrough for holding various items of food to be cooked, the food items traveling in a circular path about the longitudinal axis of said rotating vertical support said skewers having a first and second end conically tapered to a point; and

mechanized means detachably connected to said first end of said vertical support for rotating said vertical support about its longitudinal axis.

5,586,491

DISPOSABLE BARBECUE GRILL SHIELD

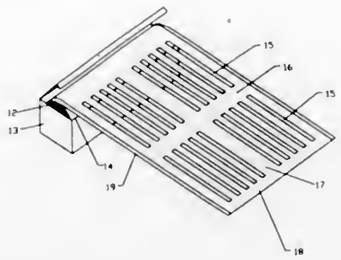
Robert J. Diller, and Barbara J. Diller, both of 800 Lagunita Dr., Soquel, Calif. 95073

Filed Apr. 28, 1995, Ser. No. 431,311

Int. Cl.[6] A47J *27/00*

U.S. Cl. 99—450 **4 Claims**

1. A disposable shield for covering an existing barbecue grill comprising a flexible metal foil in the form of a roll having edges with a repeating pattern of rectangular vents, and a score line spaced inwardly from the edges of the roll to allow for manual upturning of the edges against a side of the grill after a desired length of foil is removed from the roll.



5,586,492

APPARATUS FOR THE WETTING OF CEREALS WITH A LIQUID

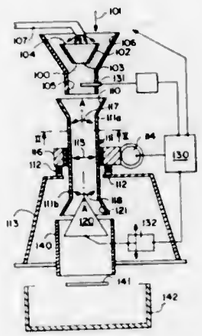
Dieter O. Graef, Neumuehle, D-35633 Lahnau-Dorlar, Germany

Division of Ser. No. 193,010, Feb. 17, 1994, Pat. No. 5,512,310. This application Sep. 29, 1995, Ser. No. 536,186

Claims priority, application Germany, Aug. 17, 1991, 41 27 290.0

Int. Cl.[6] B02B *3/00*

U.S. Cl. 99—516 **27 Claims**



1. An apparatus for the wetting of a mixture of cereals with liquid, comprising a shaking apparatus which comprises at least one pipe having substantially smooth walls, the at least one pipe is arranged with a horizontal or approximately vertical axis and is connected to at least one motor setting the pipe in shaking movement, wherein said at least one motor and said at least one pipe are arranged for shaking said at least one pipe with sufficient force to impart acceleration forces to at least a portion of said cereal/liquid mixture, which acceleration forces provide a substantially uniform wetting of said cereals and a substantially uniform penetration of the liquid from the husk into the inside of the cereal.

5,586,493

PAPER RECYCLING RACK

Marjorie N. McEntee, 3350 Airport Rd. #42, Allentown, Pa. 18103

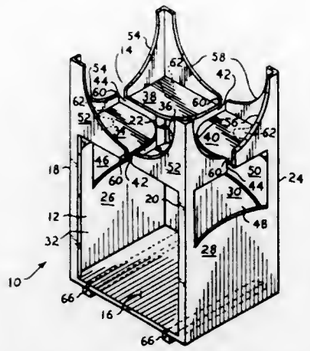
Filed Jan. 3, 1996, Ser. No. 580,977

Int. Cl.[6] B65B *27/08*

U.S. Cl. 100—34 **14 Claims**

1. A paper recycling rack providing for the bundling of loose papers and storage of bundled papers therein, said rack comprising:

a lower paper storage area comprising a generally rectangular floor panel having first through fourth upper platform supports extending upwardly therefrom and defining four corners for said floor panel and said rack;



a pair of elongate strips of resilient material oppositely disposed beneath said floor panel;

separate first through fourth upper platforms each extending inwardly from a respective one of said upper platform supports, with said upper platforms disposed in a rectangular array and defining first and second orthogonally disposed binding slots therebetween;

said upper platforms each having an opening therebelow, with each said opening communicating with a respective one of said binding slots and providing for the passage of binding material therethrough, and;

first through fourth discontinuous peripheral upper paper retaining walls each extending upwardly from said upper platforms, with each of said walls including a gap therein corresponding to and communicating with a respective one of said binding slots and providing for the passage of binding material therethrough and about any papers resting upon said upper platforms, whereby;

papers are placed in a generally rectangular stack upon said upper platforms and binding material is secured orthogonally about the stack by means of access provided by said openings below said upper platforms, said binding slots, and each said gap in said upper paper retaining walls, with bound stacks being placed within said lower paper storage area for transfer to a recycling facility.

5,586,494

SWIVELLING PISTON PRESS

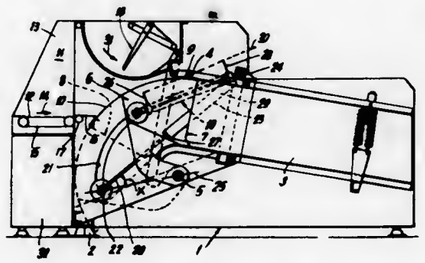
Jürgen Simonis, Wolfenbüttel, Germany, assignor to Welger GmbH, Wolfenbüttel, Germany

Filed May 26, 1995, Ser. No. 451,578

Claims priority, application Germany, May 26, 1994, 9408619 U

Int. Cl.[6] B30B *9/30;1/32*

U.S. Cl. 100—189 **5 Claims**



1. A swivelling piston press for forming bales of material, said swivelling piston press comprising:

a housing;

compression channel means formed in said housing for receiving the material to be baled;

a compression piston supported in said compression channel means for pivotal movement about an axis into an extended position of the compression piston during a return stroke thereof for enabling feeding of the material to be baled into said compression channel means, and into a retracted position thereof during a compression stroke thereof for compressing the material received in said compression channel means to form a bale;

a piston-cylinder unit for pivoting said compression piston between the extended and retracted positions thereof and including a cylinder pivotally supported on said compression channel means and a piston rod connected to said compression piston;

wherein said piston rod is tension-stressed during the compression stroke of said compression piston and, in the retracted position of said compression piston, forms an acute angle with a connection line connecting the pivotal axis of said compression piston with a connection point of said compression piston with said piston rod.

5,586,495

TRANSFER PRESS

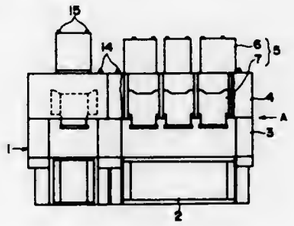
Kazuo Ogawa, and Naoaki Ikeoka, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 28, 1992, Ser. No. 997,196

Claims priority, application Japan, Dec. 27, 1991, 3-358319; Jul. 15, 1992, 4-187759

Int. Cl.[6] B30B *15/30;15/04*

U.S. Cl. 100—207 **21 Claims**



1. In a transfer press having a plurality of workstations through which workpieces are sequentially fed in a first workpiece feed direction from workstation to workstation for accomplishing a plurality of pressing operations, the improvement comprising the combination of:

a body having components comprising: a bed, uprights provided vertically upon said bed, a pair of supporting beams provided upon said uprights and disposed in spaced relationship with each other in a horizontal direction perpendicular to the direction in which a workpiece is fed, and a plurality of pressing units each of which is independently provided for a respective one of said plurality of pressing operations, said components being readily dividable from each other;

a plurality of crowns;

a plurality of slides;

each of said plurality of pressing units including a respective one of said plurality of crowns, which is removably mounted upon said supporting beams, and a respective one of said plurality of slides, which is positioned for movement with respect to the associated crown.

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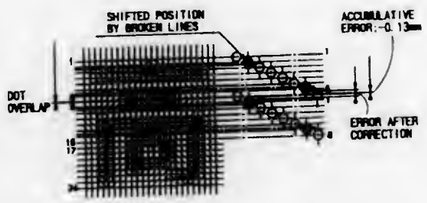
5,586,496

DOT LINE PRINTER WITH ADJUSTED DOT POSITIONS FOR CANCELING SHEET FEED ERROR

Makoto Shinohara; Yoshikane Matsumoto, and Shigenori Suematsu, all of Hitachinaka, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 348,887
Claims priority, application Japan, Nov. 26, 1993, 5-297007
Int. Cl.[6] B41J 2/255
U.S. Cl. 101—93.04 9 Claims



1. A dot line printer comprising:

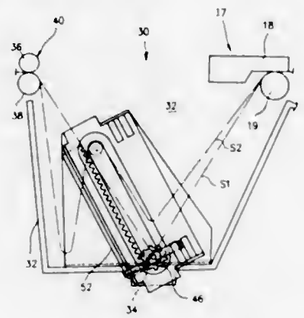
a hammer bank accommodating a plurality of print hammer which have pins for making impressions of dots on a sheet of paper, said pins of said plurality of print hammers having respective home positions displaced at an equi-distant pitch in a first direction perpendicular to a second direction in which said hammer bank reciprocates so that N dot lines are printable with each of forward and backward movements of said hammer bank where N is an integer equal to or greater than two, wherein at least one of said pins for printing N dot lines is shifted from its home position to compensate for an error causing impressions of dots to be made at an unequal pitch in the first direction as a result of consecutive forward and backward movement of said hammer bank.

5,586,497

STENCIL PRINTING MACHINE WITH STENCIL TENSIONING MEMBER

Shingo Shimada, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

Filed Jun. 23, 1995, Ser. No. 494,025
Claims priority, application Japan, Jul. 4, 1994, 6-152353
Int. Cl.[6] B41L 13/04
U.S. Cl. 101—128.4 7 Claims



1. A stencil printing machine, comprising:

a cylindrical printing cylinder around an outer peripheral surface of which a perforated stencil sheet can be wrapped;

a stencil sheet storing section for holding a blank stencil;

a stencil sheet perforating means for perforating a stencil sheet fed from said stencil sheet storing section;

a stencil sheet cutting means disposed between said stencil sheet perforating means and said printing cylinder, for cutting a perforated stencil sheet;

a stencil sheet stocking section disposed between said stencil sheet perforating means and said stencil sheet cutting means, for stocking a perforated stencil sheet;

a single long member disposed, inside said stencil sheet stocking section, in parallel with a direction of width of said stencil sheet beneath said stencil sheet stocked inside said stencil sheet stocking section, and movable between an upper limit position and a lower limit position;

a driving mechanism for moving said long member up and down; and

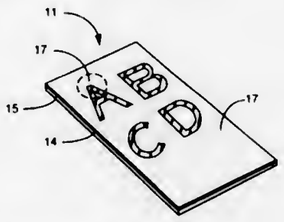
a stencil sheet feed means for feeding said perforated stencil sheet from said stencil sheet stocking section to said stencil sheet cutting means.

5,586,498

DUPLICATE COPIES FROM A PRINTER OR COPIER

Dan Kikinis, Saratoga, Calif., assignor to Elonex I.P. Holdings, Ltd., London, England

Division of Ser. No. 291,987, Aug. 17, 1994. This application Oct. 26, 1995, Ser. No. 548,848
Int. Cl.[6] B41M 1/12
U.S. Cl. 101—127 3 Claims



1. A method of priming two copies of a document in a single pass through a printer, comprising the steps of:

(a) making a form comprising two layers of flat printing stock, one layer having a pattern of openings exposing area on the other layer;

(b) passing the form through a printer;

(c) printing a copy of the document by applying printing ink to the side of the form having the pattern of openings, wherein some of the ink remains on said side of the form to form one copy and the remainder of the ink passes through the openings to mark the other layer; and

(d) separating the two layers, providing two copies of the document printed.

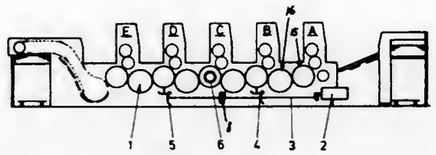
5,586,499

METHOD FOR ELIMINATING GEAR TRAIN BACKLASH IN A DRIVE FOR A MULTI-COLOR SHEET-FED PRINTING MACHINE HAVING FACE PRINTING AND PERFECTING MODES

Hendrikus Beaumont, Eupen, Belgium; Hanns-Otto Haas, Heusenstamm, Germany; Holger Wiese, Obertshausen, Germany, and Bernd Lindner, Heusenstamm, Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Sep. 29, 1995, Ser. No. 536,938
Claims priority, application Germany, Sep. 30, 1994, 44 35 011.2
Int. Cl.[6] B41F 5/02
U.S. Cl. 101—211 17 Claims

1. A method for eliminating gear train backlash in the drive of a sheet-fed printing machine when changing the printing mode of the machine between face printing and perfecting or vice versa, the



printing machine having a gear train, a longitudinal drive shaft, and at least two input drives for connecting the longitudinal drive shaft to the gear train, the method comprising the steps of:

operating the printing machine to assume a predefined drive position for changing the printing mode;

releasing a clutch in the longitudinal shaft disposed between the at least two input drives to separate the drive shaft into two segments;

fixing the position of the gear train;

separating the gear train into a first section and a second section by releasing a separation device disposed between the two sections of the gear train;

rotating the second section of the gear train to a new position associated with the new printing mode while maintaining the first section of the gear train in the fixed position;

reconnecting the first and second sections of the gear train by engaging the separation device;

releasing the first section of the gear train for rotation;

rotating a first segment of the longitudinal shaft relative to a second segment of the longitudinal shaft; and

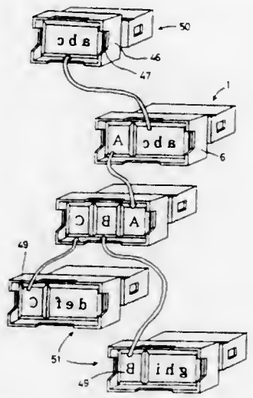
engaging the clutch in the longitudinal shaft to reconnect the two segments of the drive shaft with the first segment rotated relative to the second segment to apply a torque to compensate for backlash conditions in the gear train.

5,586,500

STENCIL STAMP

Hiroshi Takami; Yoshihiro Yasui, and Takashi Okumura, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 10, 1995, Ser. No. 401,688
Claims priority, application Japan, May 19, 1994, 6-105222
Int. Cl.[6] B41F 31/00
U.S. Cl. 101—327 20 Claims



1. A stencil stamp, comprising:

a handgrip;

a stencil stamp block holding member connectable to said handgrip; and

a plurality of stencil stamp blocks, said stencil stamp block holding member having means to simultaneously detachably mount a plurality of stencil stamp blocks on said stencil stamp block holding member, each stencil stamp block comprising:

a base member,

an ink-bearing member mounted on said base member, and

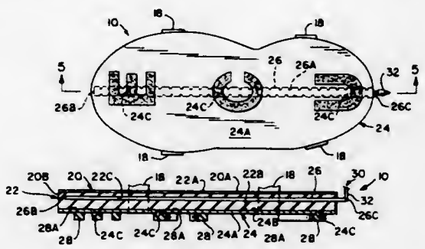
a thermal stencil sheet having a stamping central portion, each said stamping central portion covering said ink-bearing member, the remainder of said thermal stencil sheet which surrounds said stamping central portion covering said base member, said stamping central portion having a plurality of apertures formed therein, ink from said ink-bearing member being passable through said plurality of apertures during a stamping operation to form an ink image on a recording sheet.

5,586,501

DISAPPEARING INK MARKING SYSTEM

Bartolome Burguera, 1103 8th Ave. South West, Rochester, Minn. 55902, and Richard K. Stanzak, P.O. Box 195, Bath, N.C. 27808

Filed Oct. 25, 1995, Ser. No. 547,947
Int. Cl.[6] B41M 1/40
U.S. Cl. 104—368 18 Claims



1. A disappearing ink marking system adaptable to a sole of a user, comprising:

a) an upper layer having an upper layer outer surface and an upper layer inner surface;

b) an intermediate layer having an intermediate layer upper surface affixed to said upper layer inner surface and an intermediate layer lower surface, said intermediate layer containing an intermediate layer longitudinally disposed aperture;

c) a lower layer having a lower layer outer surface, a lower layer inner surface affixed to said intermediate layer lower surface, said lower layer containing at least one lower layer aperture;

d) a reservoir tube partially disposed within said intermediate layer longitudinally disposed aperture and containing a plurality of reservoir tube apertures which are in fluid communication with said intermediate layer;

e) a disappearing ink flowable through said reservoir tube; and

f) at least one image block having an image block upper surface removably affixed to said lower layer lower surface, said at least one image block being in fluid communication with said at least one lower layer aperture so that said disappearing ink flowing through said reservoir tube escapes through said plurality of reservoir tube apertures and enters said intermediate layer and is absorbed therein where upon when pressure is applied to said intermediate layer and said at least one image block said disappearing ink is forced from said intermediate layer through said at least one lower layer aperture and into said at least one image block which in turn causes said at least one image block to disperse said disappearing ink and leave a temporary image.

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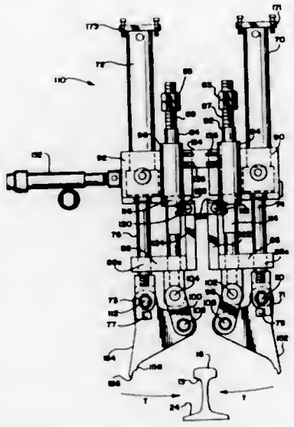
5,586,502

APPARATUS FOR INSTALLING AND REMOVING RAIL CLIPS

Robert M. Weber, Ingleside, Ill., assignor to Nordco Inc., Milwaukee, Wis.

Filed Mar. 14, 1995, Ser. No. 403,635
Int. Cl.[6] E01B *29/24*
U.S. Cl. 104—17.2 13 Claims



1. A rail clip installer configured for connection to a vehicle for installing transverse mount rail clips onto a rail, the rail having a gage side and a field side, said rail clip installer comprising:

at least one clip applicator;

at least one actuator having a substantially vertical reciprocating output shaft operably connected to said applicator for reciprocating said applicator relative to the rail; and

at least one guide rod operably connected to said actuator and being disposed between said actuator and the rail for guiding said reciprocation of said shaft, said rod being pivotally connected to said applicator for translating the substantially vertical motion of said output shaft into substantially horizontal reciprocating motion of said applicator transverse to the rail.

5,586,503

PASSENGER RESTRAINT SYSTEM

Don W. Rehorn, 140 Calle San Simon, Sante Fe, N.M. 87505

Filed Jun. 7, 1995, Ser. No. 472,324
Int. Cl.[6] B61B *11/00*
U.S. Cl. 104—241 21 Claims

1. A passenger restraint system for restraining passengers in an elevated, open-air vehicle, comprising:

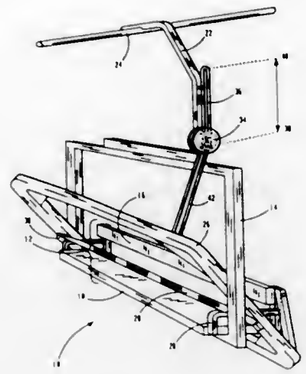
a safety bar mounted to the vehicle and pivotable between vertical and angled positions;

restraining means fixed to the safety bar and operable to move between restraining and non-restraining positions;

movable means movable along the safety bar and operable to move the restraining means between restraining and non-restraining positions;

means for securing the restraining means to the safety bar while in its restraining position; and

transmission means connected to the safety bar for moving the movable means.

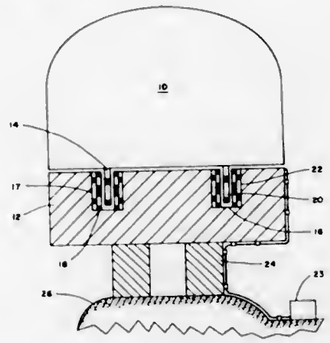


5,586,504

DUAL-KEEL ELECTRODYNAMIC MAGLEV SYSTEM

Jianliang He, Naperville; Zian Wang, Downers Grove; Donald M. Rote, Lagrange; Howard T. Coffey, Darien; John R. Hull, Westmont; Thomas M. Mulcahy, Western Springs, and Yigang Cai, Woodridge, all of Ill., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed May 11, 1995, Ser. No. 438,829
Int. Cl.[6] B60L *13/04*
U.S. Cl. 104—282 7 Claims



1. A magnetic levitation, guidance and propulsion system for a vehicle having a base and adapted to travel over a roadbed comprising:

a pair of vertical keels axially aligned along the base of said vehicle;

a row of superconducting magnets integrally connected to and arranged lengthwise along each of said keels and oriented so that said magnets' poles are approximately perpendicular to a vertical plane formed by said keel;

a guideway affixed along said roadbed, said guideway having a pair of vertical slots longitudinally aligned to receive said vertical keels;

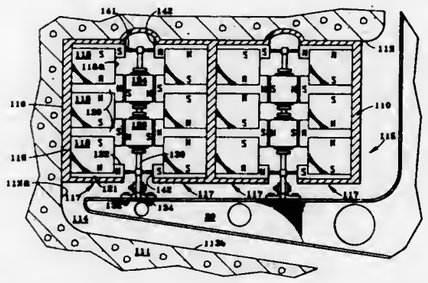
electromagnetic means affixed to opposing vertical sides of said vertical slots for interacting with said row of superconducting magnets to levitate, guide and propel said vehicle where both poles or double-sides of said superconducting magnets electromagnetically interact with said electromagnetic means when said means is activated to form two double-sided linear synchronous motors for propulsion.

5,586,505

LEVITATION SYSTEM USING PERMANENT MAGNETS FOR USE WITH TRAINS AND THE LIKE TYPE OF RIGHT-OF-WAY VEHICLES

Elberto Berdut, Orquidea No. 98, Santa Maria, Guaynabo, Puerto Rico

Continuation-in-part of Ser. No. 184,440, Jan. 21, 1994, Pat. No. 5,452,663, which is a continuation-in-part of Ser. No. 45,863, Apr. 14, 1993, Pat. No. 5,431,109. This application Feb. 22, 1995, Ser. No. 392,247
Int. Cl.[6] B60L *13/10*
U.S. Cl. 104—283 13 Claims



1. A magnetic unit, comprising:

a first group of at least a first pair of permanent magnets comprising either ceramic magnets or ferrous magnets having like poles of said permanent magnets positioned adjacent each other;

a second group of at least a second pair of permanent magnets comprising either ceramic magnets or ferrous magnets having like poles of said permanent magnets positioned adjacent each other, said first and said second groups of said permanent magnets defining a channel therebetween;

at least a third pair of magnetically permeable members comprising malleable steel members, malleable iron members, or molded iron members, one of said third pair being respectively located between said adjacent surfaces of said pair of permanent magnets and located adjacent each outer surface of said pair of permanent magnets; and

means for securing said pair of magnetically permeable members and said pair of permanent magnets, thus to provide a said magnetic unit which concentrates its magnetic flux through said malleable steel members at opposed locations in said channel;

at least a third permanent magnet located in said channel, each pole of said third magnet being positioned adjacent an opposite magnetic pole of said first pair of permanent magnets at a surface of one of said magnetically permeable members, thus to maintain a stable positional relationship by the magnetic effect of the relationship among said first, second, and third permanent magnets.

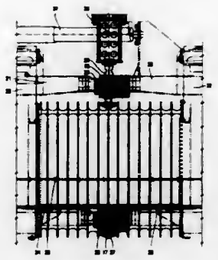
5,586,506

BALL-AND-SOCKET COUPLING, PARTICULARLY FOR RAILWAY CARS

Harald Heubusch, Büchenbach, and Jörg Rösler, Feucht, both of Germany, assignors to AEG Schienenfahrzeuge GmbH, Henningsdorf, Germany

Filed Dec. 12, 1995, Ser. No. 571,117
Claims priority, application Germany, Dec. 21, 1994, 9420230 U
Int. Cl.[6] B61G *5/00*
U.S. Cl. 105—3 7 Claims

6. The combination of a first railway car, a second railway car and two vertically spaced, axially aligned, upper and lower ball-and-socket couplings connecting the first and second railway cars with one another; each said ball-and-socket coupling comprising



(a) a U-shaped welded support frame having a base and first and second legs extending from said base; said first and second legs being spaced from one another and defining an open side of said frame opposite said base; said first leg forming a ball-holding pin and said second leg being attached to said first railway car;

(b) a ball traversed and carried by said ball-holding pin;

(c) a support bracket attached to said second railway car;

(d) a socket affixed to and carried by said support bracket; said ball nesting in said socket;

(e) a lid closing said open side of said frame; and

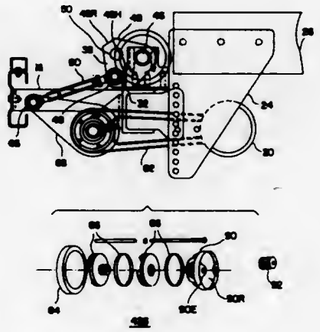
(f) securing means for releasably attaching said lid to said frame.

5,586,507

RAIL GUIDE WHEEL APPARATUS WITH DOUBLE OVERCENTER LINKAGE

Harry Madison, Memphis, Tenn., and Jeffrey L. Tilley, Glenwood, Iowa, assignors to Harsco Corporation, Wormleysburg, Pa.

Filed Jul. 24, 1995, Ser. No. 505,946
Int. Cl.[6] B61F *1/00*
U.S. Cl. 105—215.2 17 Claims



1. A rail guide wheel apparatus comprising:

a first rail wheel;

a first rail arm having a wheel end on which the first rail wheel is rotatably mounted and a mount end;

a second rail wheel;

a second rail arm having a wheel end on which the first rail wheel is rotatably mounted and a mount end; and

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a position adjustor operably connected to move each of the first and second rail wheels between rail positions whereat they may engage rails and road positions whereat they are removed from any road surface; and

wherein each of the first and second rail wheels is automatically secured against changing in either way between rail and road positions; and wherein the position adjustor includes a linkage structure movable between an overcenter rail state and an overcenter road state, each of the overcenter rail and road states securing the first and second rail wheels against changing between their rail and road positions; and further comprising: first and second wheel arms having the respective first and second rail wheels mounted on wheel ends thereof, each of the first and second wheel arms are pivotable about corresponding first and second wheel arm axes; at least one torque member operable to apply torque for moving at least one of the first and second wheel arms about the corresponding one of the first and second wheel arm axes; and wherein the linkage structure includes at least one linkage and one crank member pivotably connected thereto, the crank member rotating about a crank axis and the linkage directly connected to the torque member.

5,586,508

ADJUSTING DEVICE FOR A MATCHING TABLE

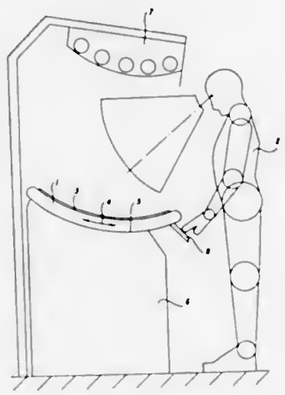
Klaus Bähr, Offenbach am Main, Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Germany

Filed Jan. 20, 1995, Ser. No. 375,967

Claims priority, application Germany, Jan. 20, 1994, 44 01 532.1

Int. Cl.[6] A47F *5/12*

U.S. Cl. 108—2 **2 Claims**



1. In combination with a matching table having a frame and a support for at least one copy to be matched, an adjusting device for reciprocatingly facilitating moving the support towards and away from an observer in an adjusting movement, comprising a guide for the adjusting movement provided in common for the support and the frame of the matching table, frictional retaining means defined at the support for releasably holding the support fast with respect to the frame, said frictional retaining means including a spring-loaded lock acting on said frame, and a tension band engaging said lock and tightenable for releasing said lock.

5,586,509

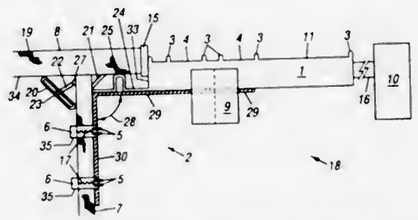
CARD TABLE FOOD, BEVERAGE, BIDDING BOX AND CONVENTION CARD HOLDING APPARATUS

Howard L. Mangold, 458 Sharon Dr., San Antonio, Tex. 78216, and Anita L. Mangold, 4026 Georgetown Rd., Blue Ash, Ohio 45236

Filed May 23, 1995, Ser. No. 447,396

Int. Cl.[6] A47B *41/04*

U.S. Cl. 108—28 **12 Claims**



1. An improved portable combination apparatus for mounting to the leg at the corner of a card ruble comprising:

a) platform means for receiving card game accouterments and refreshments, comprising a generally planar upper surface, a perimeter flange extending downward relatively from said upper surface, at least one notch means formed in said platform to receive the corner of a card table and a horizontal stabilizing ledge extending from the perimeter flange at the notch in said platform;

b) at least one support brace means for supporting said platform in position proximate the card table;

c) at least one retaining clip means for releasably securing said support brace to said card table leg; and,

d) a raised stabilizing ridge on said ledge, for in combination with said ledge and said perimeter flange at said notch, nesting the upper surface of said ledge and ridge combination with the lower surface of a card table proximate the support leg of said card table.

5,586,510

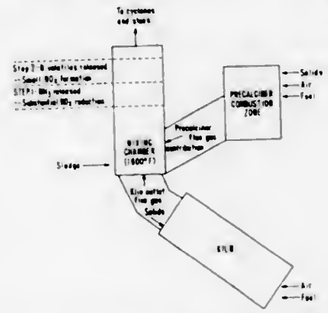
METHOD AND SYSTEM FOR CONTROLLING POLLUTANT EMISSIONS IN COMBUSTION OPERATIONS

R. Leon Leonard, Sacramento; Earl F. Bouse, Walnut Creek, and Anne T. McQueen, Huntington Beach, all of Calif., assignors to Cement Industry Environment Consortium, Riverside, Calif.

Filed Mar. 16, 1994, Ser. No. 213,718

Int. Cl.[6] F23J *11/00*

U.S. Cl. 110—345 **20 Claims**



1. A process for reducing pollutant emissions from a combustion operation comprising introducing particles of aqueous sludge at a point in a flue gas outlet of a combustion operation wherein a temperature is approximately 1500° F. to approximately 1800° F., and wherein the sludge introduced in the combustion operation contains an amount of ammonia effective to reduce NO_x emissions, whereby pollutant emissions in outlet flue gases produced by the combustion operation are reduced.

5,586,511

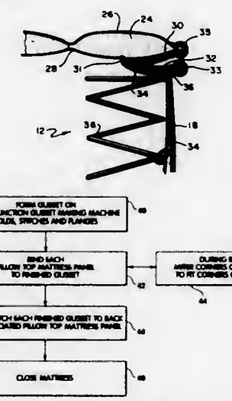
METHOD AND APPARATUS FOR ASSEMBLY OF PILLOW-TOP MATTRESS COVERS

Michael R. Porter, Topsfield; Charles E. Mulcahey, Beverly, and John J. Kirby, Hamilton, all of Mass., assignors to Porter Sewing Machines, Inc., Beverly, Mass.

Division of Ser. No. 422,151, Apr. 14, 1995, Pat. No. 5,501,164, which is a continuation of Ser. No. 101,941, Aug. 4, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,033

Int. Cl.[6] D05B *1/00*

U.S. Cl. 112—2.1 **8 Claims**



7. Apparatus for assembly of a pillow-top mattress cover having at least a top panel, a side panel, a gusset for connecting the top panel to the side panel, and flange material for attachment of the gusset to an inner spring, the gusset having two flaps, said apparatus comprising:

a gusset-forming machine for folding gusset material longitudinally to form a folded edge and the two flaps which are joined at the folded edge, and for stitching together the two flaps;

a binding machine for securing a free edge of one flap of the gusset to an outer edge of the top panel;

a sewing machine for providing a mitered corner to the gusset, said sewing machine being disposed sufficiently closed to said binding machine to allow the gusset to be mitered while the gusset is partially attached to the top panel and without removing the top panel from said binding machine; and

a stitching machine for stitching the one flap of the gusset to an undersurface of the top panel.

5,586,512

SHIP'S HULL VIBRATION DAMPER

Finn Orbeck, Sunderland, United Kingdom, assignor to Orian Technology Limited, Sunderland, United Kingdom

PCT No. PCT/GB92/02053, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO93/09025, PCT Pub. Date May 13, 1993

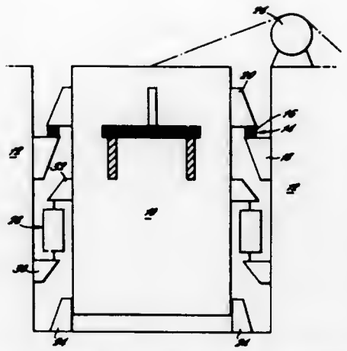
PCT Filed Nov. 6, 1992, Ser. No. 232,182

Claims priority, application United Kingdom, Nov. 7, 1991, 9123644

Int. Cl.[6] B63B *43/00*

U.S. Cl. 114—65 R **26 Claims**

1. An apparatus for inclusion in a ship comprising a mass at least in part comprised of a chain locker and that portion of the chain



stored therein and having a hull vibrating at fundamental and harmonic frequencies of a transverse two node mode of wave induced vibration, means for vibrationally coupling the mass to the ship's hull and means for damping the movement of the mass, the mass being so sized and located as to, when in use, reduce the fundamental and/or harmonic frequencies of the transverse two node mode of wave-induced vibration in the ship's hull.

5,586,513

WATERTIGHT AND THERMALLY INSULATING TANK BUILT INTO A BEARING STRUCTURE

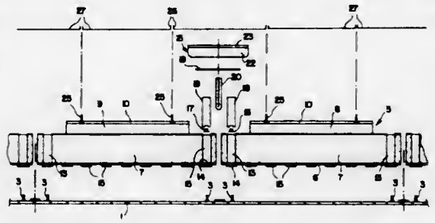
Pierre Jean, Dampierre, and Jean-Michel Chauvin, Plaisir, both of France, assignors to Gaztransport & Technigaz, Trappes, France

Filed Sep. 18, 1995, Ser. No. 529,401

Claims priority, application France, Sep. 20, 1994, 94 11165

Int. Cl.[6] B63B *25/16*

U.S. Cl. 114—74 A **22 Claims**



1. A watertight and thermally insulating tank built into a bearing structure, comprising:

a primary watertight barrier in contact with a material contained within said tank and comprising metal strakes including edges turned upwardly towards an interior of said tank, said strakes being made of thin sheet metal with a low coefficient of expansion;

a secondary watertight barrier positioned between said primary watertight barrier and the bearing structure;

a primary thermal insulating barrier;

a secondary thermal insulating barrier, said primary thermal insulating barrier and said secondary thermal insulating barrier being alternately arranged with said primary watertight barrier and said secondary watertight barrier; and

a weld support mechanically held on said primary thermal insulating barrier and constituting an expansion joint, said strakes being butt-welded via said turned-up edges to two faces of said weld support;

said secondary watertight barrier, said secondary thermal insulating barrier and said primary thermal insulating barrier each comprising a set of prefabricated panels fixed to the bearing

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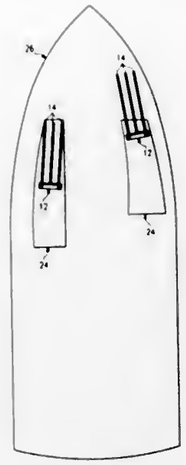
structure, wherein a zone at a junction between two adjacent panels is filled in so as at least to ensure continuity of said secondary watertight barrier, each prefabricated panel being formed of:

a first rigid plate including a layer of thermal insulant, said panels and said layer of thermal insulant together forming said secondary thermal insulating barrier;

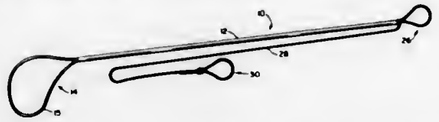
a flexible sheet bonded substantially to the entire surface of said layer of thermal insulant, said flexible sheet including at least one continuous fine metal foil forming said secondary watertight barrier;

a second layer of thermal insulant that at least partially covers said flexible sheet and that is bonded thereto; and

a second rigid plate covering said second layer of thermal insulant, said second rigid plate and said second layer of thermal insulant forming said primary thermal insulation barrier.



5,586,514
MOORING DEVICE
Thomas M. Yuscavage, 149 Bear Creek Rd., Dupont, Pa. 18641
Filed Mar. 29, 1995, Ser. No. 413,876
Int. Cl.[6] B63B *21/00*
U.S. Cl. 114—230 **6 Claims**



1. A mooring device comprising an elongated tubular handle having forward and rearward open ends;

flexible tubular means formed into a loop having opposite ends connected to the forward end of said handle;

a continuous line having leading and trailing ends, said leading end extending into said rearward end, through said handle, through said flexible tubular means to form said first loop therewith, through said handle and out of said rearward end, said leading and trailing ends of said line being tied at said rearward end of said handle to form a second loop.

5,586,515
FISHING ROD STORAGE APPARATUS AND METHOD
James A. Nickles, 1400 Kerr Station Rd., Cabot, Ark. 72023
Filed Sep. 11, 1995, Ser. No. 526,598
Int. Cl.[6] B63B *35/14*
U.S. Cl. 114—255 **2 Claims**

1. A fishing rod storage device comprising:

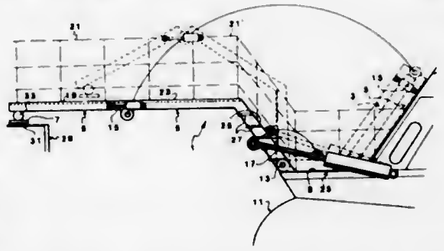
a base having an upper, substantially planar portion disposed substantially vertically and a lower, substantially planar portion disposed substantially perpendicular thereto, said upper portion of said base having a first plurality of holes passing therethrough and said lower portion of said base having a second plurality of holes passing therethrough to facilitate securing said device within a rod box;

a plurality of tubes secured to said upper portion of said base and aligned with said first plurality of holes so that said base retains and aligns said tubes substantially horizontally, each of said first plurality of holes and each of said plurality of tubes being sized to permit a tip end of a fishing rod to pass therethrough; and

each of said plurality of tubes being of sufficient length to store a fishing rod in close proximity to other fishing rods while preventing entanglement of rod tip ends, fishing lines and lures; and

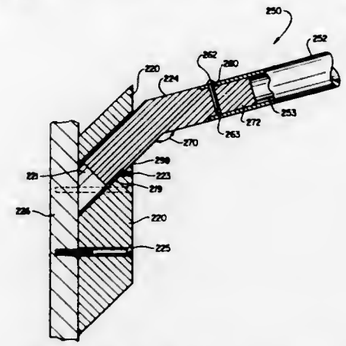
wherein each of said plurality of tubes has a rear end portion and wherein each of said plurality of tubes is secured to said base at said rear end portion of said tube whereby substantially the entire length of each of said plurality of tubes extends forward of said base.

5,586,516
RELATING TO BOARDING RAMPS
Urs A. Hagen, Eggenran; Martin Schmid, Banhofstrasse, both of Switzerland, and Gwyn P. Owen, Clwyd, Great Britain, assignors to Services Algoa International Anstalt, Switzerland
Filed Sep. 5, 1995, Ser. No. 523,409
Claims priority, application United Kingdom, Sep. 6, 1994, 9417949
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—362 **11 Claims**



1. A boarding ramp which, in use, is pivotally secured to a waterborne craft, said boarding ramp comprising an elongated passageway, one end region of which is adapted to be pivotally attached to the waterborne craft, a hydraulic ram being connected to the passageway and connectable to the craft to, in use, control pivotal movement of the passageway, a controllable bypass connected across the hydraulic ram, a solenoid valve disposed and operative for controlling said controllable bypass, and an electromagnet being arranged on the other end region of the passageway for use in securing said other end region of the passageway to an unloading location.

5,586,517
FLAG SUPPORT AND ANGULATION SYSTEM
Tucker Willis, 4717 Wildwood Rd., Dallas, Tex. 75209, and James Cinquemani, Jr., 2412 Hardwick, Dallas, Tex. 75208
Continuation-in-part of Ser. No. 42,155, Apr. 2, 1993, Pat. No. 5,335,621. This application Jul. 15, 1994, Ser. No. 276,068
Int. Cl.[6] G09F *17/00;* **A01K** *97/10*
U.S. Cl. 116—173 **20 Claims**

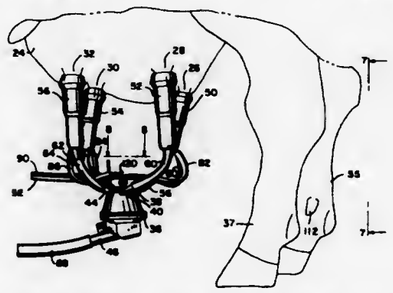


1. An improved flag staff assembly of the type wherein an elongate flag staff, having at least a hollow region formed in one end thereof, is disposed at an angle relative to a generally vertical surface having means for supporting a flag therefrom above a ground region wherein the improvement comprises:

a base member adapted for securement to said vertical surface in support of said flag staff therefrom, said base member being formed with an aperture therein adapted for receipt of said flag staff in a first angulated position therein; and

means for re-angulating said flag staff to another angulated position, said means for re-angulating including an angulated shaft having first and second ends and adapted for receipt of said first end into said aperture, said second end including a neck portion for receiving said hollow region, formed in one end of said flag staff, over said neck portion, wherein said first end of said angulated shaft includes a slotted portion therein, said slotted portion being adapted for receiving an elongate member extending through said base member for preventing rotation of said angulated shaft in said base member.

5,586,518
MILKING CLUSTER AIR FORK
James A. Carrano, Stoughton, Wis., assignor to DEC International, Inc., Madison, Wis.
Filed Mar. 27, 1995, Ser. No. 411,417
Int. Cl.[6] A01J *5/04*
U.S. Cl. 119—14.51 **18 Claims**



1. A milking cluster for a dairy animal having an udder and a plurality of teats, and a backbone defining an axially extending longitudinal direction, comprising:

a claw having a plurality of inlets, and an outlet, said claw lying along a central longitudinal axis extending between the animal's legs and generally parallel to said backbone;

a plurality of teat cups, each connected to a respective teat;

a plurality of milk tubes, each connecting a respective claw inlet to a respective teat cup;

an air fork having a plurality of outlets, and one or more inlets;

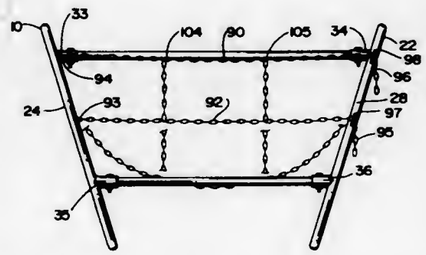
a plurality of air tubes, each connecting a respective air fork outlet to a respective teat cup;

a milk hose connected to said claw outlet;

one or more vacuum pulsation air lines connected to said one or more air fork inlets;

wherein said air fork outlets direct said air tubes laterally inwardly of said milk tubes, rather than outwardly of said milk tubes, such that if the animal lifts her rear leg and steps forward, the dew claw on the inside of her leg will not hook an air tube and pull the respective teat cup off the teat, and wherein said air fork outlets extend generally axially longitudinally such that said air tubes extend generally axially longitudinally therefrom.

5,586,519
BALE FEEDER
Everett Wilkinson, 8124 Snowdell, Bonne Terre, Mo. 63628
Filed Nov. 9, 1994, Ser. No. 336,877
Int. Cl.[6] A01K *1/10*
U.S. Cl. 119—60 **16 Claims**



1. A bale hay feeder, comprising:

a first and second side fame each frame having a top rail and bottom rail both rails having a front end and rearward end, a front side rail with a top end and bottom end connecting said front end of said top rail to said front end of said bottom rail and a rearward side rail with a top end and bottom end connecting said rearward end of said top rail to said rearward end of said bottom rail;

a bottom frame having a front cross rail and rearward cross rail and at least one support rail connecting said front cross rail to said rearward cross rail, said rearward cross rail connecting said bottom end of said rearward said rails of said first and second side frames, said front cross rails connecting said front side rails of said first and second side frames, said bottom rails of said first and second side frames are closer together than said top rail of said first and second side frames and said top rails are far enough apart to accommodate a round bale of hay;

a plurality of said vertical chains, spaced such that an animal may reach hay through said spacing, affixed to said top rail of each of said first side frame and said second side frame, extending and affixed to said support rail;

a top cross rail connecting said top end of said rearward side rail of said first side frame to said top end of said rearward side rail of said second side frame; and

a gate including at least one chain affixed and extending from said front side rail of said first side frame to said front side rail of said second side frame wherein at least one end of said chain is removably affixed to allow hay to be inserted into said hay feeder.

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5,586,520

METHOD OF MAINTAINING THE APPEARANCE OF EQUESTRIAN JUMPS

Timothy J. Cleary, 250 Round Swamp Rd., Melville, N.Y. 11747

Filed Oct. 26, 1994, Ser. No. 329,325
Int. Cl.[6] A01K *15/02*
U.S. Cl. 119—705 **3 Claims**

1. A method of maintaining a set appearance of at least one element of an equestrian jump that is subject to soiling, comprising the steps of:

encasing the jump element in a cover substantially coextensive with a length thereof;

removing the cover when it is soiled;

cleaning the cover; and

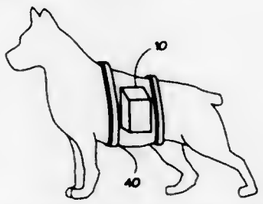
reapplying the cover to the jump element.

5,586,521

PORTABLE PET WASTE CONTAINER

Richard D. Kelley, 3114 N. 25th, Tacoma, Wash. 98406

Continuation-in-part of Ser. No. 69,445, Jun. 1, 1993, abandoned. This application Nov. 8, 1994, Ser. No. 336,307
Int. Cl.[6] A01K *23/00*
U.S. Cl. 119—858 **4 Claims**



1. A portable combination scooper-container apparatus detachably secured vertically to an animal's shoulder harness for toting animal waste and for collecting the waste from ground in the normal manner of a scoop when detached from the harness, comprising

a container with a low front side and a high back side and having an open end and a closed end with the open end angled from the high back side to the lower front side as a scoop,

means to detachably mount the container to the animal's shoulder harness,

a flat lid covering the container open end and pivotably mounted on the high back side of the container so the lid tends to remain closed over the open end by gravity and rotatable against and disposed opposite the container back side when the container is detached from the shoulder harness, such that the flat lid is then directed generally toward the container closed end and away from the open end with the flat lid between the high back side and the ground, unobstructive to the open end to fully expose the open end as a scoop, when the container back side is held close to the ground approximately parallel thereto in the normal mode of a scoop.

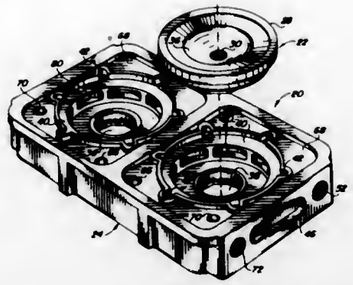
5,586,522

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES

Lawrence R. Phillis, Box 220514, Newhall, Calif. 91322, and Eugene W. VanDenBerg, II, 28169 Florence La., Canyon Country, Calif. 91351

Filed Sep. 12, 1995, Ser. No. 527,157
Int. Cl.[6] F02B *75/08*
U.S. Cl. 123—41.82 R **23 Claims**

10. A cylinder head for an internal combustion engine, comprising:



a replaceable combustion chamber dome including a spark plug housing and a dome-forming portion;

an engine cylinder head housing having means for receiving and supporting the replaceable dome therein, the replaceable dome receiving and supporting means including an aperture for receiving the spark plug housing;

means associated with the replaceable dome and the dome receiving and supporting means, for preventing rotational movement of the replaceable dome relative to the engine cylinder head housing, the rotational movement preventing means comprising a planar inner surface which defines a portion of the dome receiving and supporting means, and a corresponding planar outer surface which defines a portion of the replaceable dome and is situated adjacent to the planar inner surface;

means for directing a fluid coolant into the cylinder head to cool the replaceable dome and then exhausting the fluid coolant to a cylinder block; and

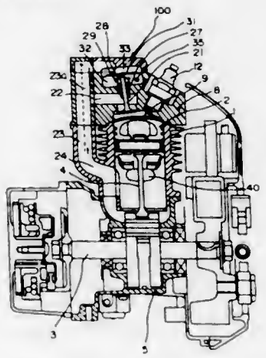
means for directing the fluid coolant from the cylinder block through the cylinder head to an outlet.

5,586,523

CRANKCASE COMPRESSION TYPE TWO-CYCLE ENGINE

Yoshitaka Kawahara; Kazunori Kudo; Yoshihide Nakatani, and Hiroyuki Takagawa, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 224,288, Mar. 28, 1994, abandoned. This application Sep. 21, 1995, Ser. No. 531,827
Claims priority, application Japan, Mar. 31, 1993, 5-094898; Dec. 28, 1993, 5-348923
Int. Cl.[6] F02B *25/04;29/00*
U.S. Cl. 123—65 VB **15 Claims**



1. A crankcase compression type single-cylinder two-cycle engine comprising:

a single crankcase;

a single cylinder communicating with said single crankcase;

a piston slidably mounted in said cylinder for movement between a top dead center position and a bottom dead center position, said piston partitioning said cylinder into a combustion chamber and a crank chamber, said combustion chamber having a first end adjacent said crank chamber and a second end remote from said crank chamber;

an air inlet opening into said crank chamber via a check valve;

an exhaust port provided in said first end of said combustion chamber;

a scavenging intake port provided in said first end of said combustion chamber adjacent said exhaust port and being in communication with said crank chamber;

an intake port opening into said second end of said combustion chamber, said intake port confronting an end of said piston;

a poppet type scavenging valve movably mounted in said intake port and confronting said end of said piston so as to be movable towards and away from said end of said piston;

a scavenging valve operating mechanism operably connected to said scavenging valve for opening said scavenging valve when said piston is located adjacent said bottom dead center position;

a scavenging passage communicating said intake port with said crank chamber; and

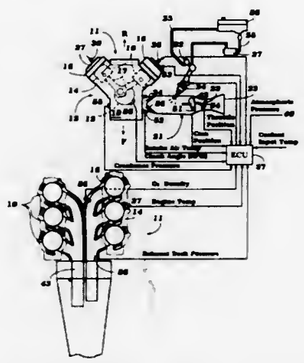
a fuel supply device communicating with said scavenging passage upstream of said intake port.

5,586,524

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kimihiro Nonaka, and Hiroaki Ohtani, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 1, 1994, Ser. No. 299,519
Claims priority, application Japan, Sep. 1, 1993, 5-217771; Sep. 1, 1993, 5-217772; Sep. 1, 1993, 5-217773
Int. Cl.[6] F02D *41/04;* **F02B** *33/04*
U.S. Cl. 123—73 A **11 Claims**



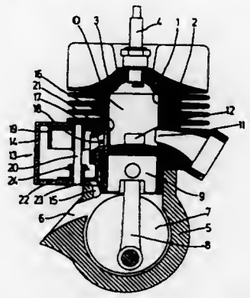
1. A fuel injection control system for a two-cycle internal combustion engine, comprising a pressure sensor installed in a cylinder of said engine for detecting crankcase pressure at the time of scavenge opening and scavenge closing to obtain a tentative intake air amount, a fuel injector for injecting fuel to said engine on the basis of said crankcase pressure detected by said pressure sensor, means for compensating the amount of fuel injected from said fuel injector in response to the condition of intake air in said crankcase to obtain a compensation factor to be multiplied by said tentative air amount to determine a true amount of fuel to be injected.

5,586,525

AIR/FUEL MIXTURE SUPPLY DEVICE FOR A TWO-STROKE INTERNAL-COMBUSTION ENGINE

Jean M. Masse, 60, rue Saint-Léger F-78100, Saint-Germain-en-Laye, France

PCT No. PCT/FR94/00972, § 371 Date Jan. 17, 1996, § 102(e) Date Jan. 17, 1996, PCT Pub. No. WO95/04212, PCT Pub. Date Feb. 9, 1995
PCT Filed Aug. 2, 1994, Ser. No. 583,043
Claims priority, application France, Aug. 3, 1993, 93 09556
Int. Cl.[6] F02B *25/20*
U.S. Cl. 123—73 B **9 Claims**



1. Air/fuel mixture supply device for a two-stroke internal-combustion engine of the type with scavenging by compressed air in the casing, the device comprising at least one cylinder, a piston capable of reciprocating motion in the cylinder for defining a combustion chamber and a scavenging-air compression casing provided with an air inlet orifice, the cylinder comprising at least one exhaust port, at least one transfer port communicating via a transfer duct with the casing, a port for introduction of an air/fuel mixture into the combustion chamber, towards the end of the scavenging, and a rotary closure member driven in synchronism with the rotation of the engine and associated with the port for introduction of the air/fuel mixture into the combustion chamber, the device further comprising an air reservoir supplied with air under a pressure greater than the pressure prevailing in the combustion chamber after opening of the exhaust port, a venturi placed between the reservoir and the rotary closure member, and a fuel feed coming from a constant-level tank and emerging in the divergent cone of the venturi.

5,586,526

LARGE TWO-STROKE INTERNAL COMBUSTION ENGINE

Henning Lindquist, Nivå, Denmark, assignor to MAN B&W Diesel A/S, Copenhagen SV, Denmark

PCT No. PCT/DK93/00364, § 371 Date Dec. 4, 1995, § 102(e) Date Dec. 4, 1995, PCT Pub. No. WO94/29577, PCT Pub. Date Dec. 22, 1994
PCT Filed Nov. 9, 1993, Ser. No. 557,193
Claims priority, application Denmark, Jun. 4, 1993, 0647/93
Int. Cl.[6] F01L *9/02*
U.S. Cl. 123—90.12 **10 Claims**

1. A large two-stroke internal combustion engine (1), in particular a main engine of a ship, having a hydraulically driven cylinder member, such as a fuel pump (18) or an exhaust valve (13), in which the hydraulic drive of the member comprises a driving piston (70) journalled in a hydraulic cylinder (69) which, through a flow passage 67, communicates with a spool valve, the spool of which (74) may occupy a position where the flow passage (67) communicates with a high-pressure source (65) for hydraulic oil, and another position where the flow passage communicates with a low-pressure port (66), and where, during normal engine operation, the spool is positionable by means of an electrically activated positioning means (64) receiving control signals from an engine controlling computer (16), and where, in case of failure of the normal engine control, the spool is alternatively positionable by

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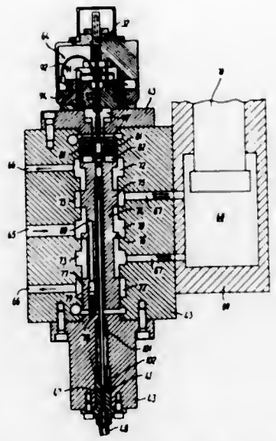


means of a camshaft (23) rotating synchronously with the crankshaft (11) of the engine, characterized in that the spool (74) is associated with a first piston (41) on which the pressure in a hydraulic conduit (48) acts, said conduit extending to a second piston (44) which may follow a cam (26) on the rotating camshaft, and that the hydraulically driven cylinder members (14, 13, 18) associated with each of the engine cylinders are mounted at the pertaining cylinder, whereas the camshaft (23) independently of the positioning of the cylinder members is disposed at an appropriate shaft drive, such as the crankshaft (11).

5,586,527

DEVICE FOR THE VARIABLE CONTROL OF THE VALVES OF INTERNAL COMBUSTION ENGINES, MORE PARTICULARLY FOR THE THROTTLE-FREE LOAD CONTROL OF 4-STROKE ENGINES

Peter Kreuter, Aachen, Germany, assignor to Meta Motoren- und Energie-Technik GmbH, Herzogenrath, Germany

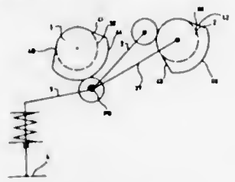
PCT No. PCT/DE93/01248, § 371 Date Jun. 9, 1995, § 102(e) Date Jun. 9, 1995, PCT Pub. No. WO94/16203, PCT Pub. Date Jul. 21, 1994

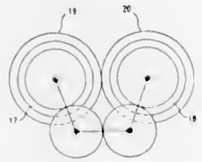
PCT Filed Dec. 22, 1993, Ser. No. 481,245

Claims priority, application Germany, Dec. 30, 1992, 42 44 551.5; Dec. 30, 1992, 42 44 550.7

Int. Cl.[6] F01L *13/00; 1/34*

U.S. Cl. 123—90.15 **12 Claims**





1. Apparatus for variable control of valves in an internal combustion engine having a crankshaft, said apparatus comprising

first and second camshafts having fixed axes and acting on a rocker lever when in turn acts on a spring loaded valve,

gear means for phase-shifting said second camshaft relative to said first camshaft, said gear means comprising a driving wheel driving said first camshaft and driven by said crankshaft, a first intermediate wheel driven by said driving wheel, a second intermediate wheel driven by said first intermediate wheel, and a driven wheel driving said second camshaft and driven by said second intermediate wheel, said first and second intermediate wheels having moveable axes, whereby moving said axes of said intermediate wheels phase-shifts said second camshaft relative to said first camshaft, and

drag means comprising a pair of engaged wheels having different operative diameters mounted on respective first and second camshafts, and friction means effective between one of said pair of wheels and one of said camshafts, thereby generating a drag force which is superposed on the force transmitted to the second camshaft by the driven wheel.

5,586,528

TAPPET FOR THE VALVE DRIVE OF AN INTERNAL COMBUSTION ENGINE

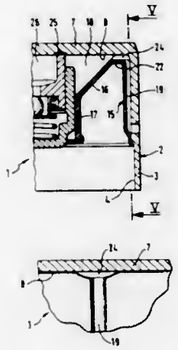
Walter Speil, Ingolstadt, Germany, assignor to Ina Walzlager Schaeffler KG, Germany

Continuation-in-part of Ser. No. 447,720, May 23, 1995, abandoned, which is a division of Ser. No. 340,024, Nov. 14, 1994, Pat. No. 5,450,826. This application Jan. 16, 1996, Ser. No. 586,376

Claims priority, application Germany, Dec. 22, 1993, 43 43 876.8

Int. Cl.[6] F01L *1/25*

U.S. Cl. 123—90.51 **1 Claim**



1. A tappet (1) for a valve drive of an internal combustion engine, comprising a hollow cylindrical housing (2) arranged with a thin-walled jacket (3) for axial displacement in a receiving bore (4) of a cylinder head (5), said housing (2) being closed at one front end (6) by a thin-walled bottom (7), the tappet (1) further comprising a hydraulic clearance compensation element (9) which extends concentric with the jacket (3) from an underside (8) of the bottom (7) and whose guide sleeve (10) facing an underside (8) of the bottom (7) is surrounded by an axially displaceable pressure piston (11) whose bottom (12) faces an end of a valve shaft (13), said tappet (1) also comprising a thin-walled cylindrical element (15) fixed in an oil-tight manner to an inner surface (14) of the jacket (3), said cylindrical element (15) extending in a region of the jacket (3) up to the housing bottom (7) and forming an annular oil reservoir (18) by merging into a radially inwards extending portion (16) which continues into an axially oriented concentric guide portion (17) for the pressure piston (11), a canal (19) for hydraulic medium starting from a supply bore (20) in the jacket (3) and extending in a region of the jacket (3) toward the housing bottom (7) and being formed in the cylindrical element (15), there

being further provided in the housing bottom (7), a recess (25) to allow oil transfer between the annular oil reservoir (18) and a central oil reservoir (26), characterized in that an upper edge (22) of the cylindrical element (15) extends directly along the underside (8) of the housing bottom (7) except in a region of a trough-like formation (24) provided in the cylindrical element (15) in a region of the underside (8) of the housing bottom (7) for oil transfer from the canal (19) into the annular oil reservoir (18), the ratio of the width of the recess (24) at an upper edge thereof facing the bottom of the width of the canal (19) is ≧1.75.

5,586,529

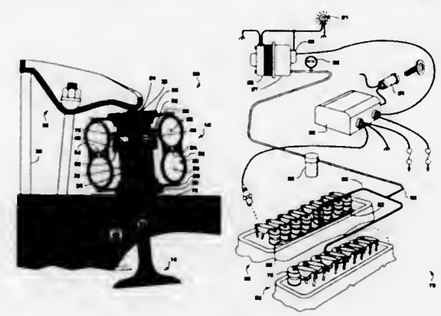
PNEUMATIC ENGINE VALVE SPRING ASSEMBLY

Serge Vallve, 33320 Hereford Way, Lake Elsinore, Calif. 92530

Filed Sep. 13, 1995, Ser. No. 527,441

Int. Cl.[6] F01L *3/10;* **F16F** *1/00*

U.S. Cl. 123—90.65 **8 Claims**



1. A pneumatic valve spring member (10) for an internal-combustion engine, comprising:

a valve guide (16), said valve guide defining a valve stem passage (24) through which a valve stem (12) may reciprocatingly travel in a manner guided by said valve guide;

a valve retainer (30), said valve retainer coupled to a distal end of said valve stem, said valve retainer reciprocatingly travelling with said valve stem;

a bellows seal (42), said bellows seal sealingly attached at a first end to said valve guide and at a second end to said valve retainer, said bellows seal preventing the further travel of blow-by gasses from said valve stem passage and allowing resiliently flexible articulation between said valve guide and said valve retainer;

a lower isolator (50), said lower isolator extending laterally about said valve guide;

an upper isolator (52), said upper isolator extending laterally about said valve retainer; and

a pressurized air cushion (60) having a hollow interior (59) and a resiliently flexible exterior (58), said pressurized air cushion held between said lower isolator and said upper isolator, said pressurized air cushion resiliently biasing said valve retainer (30) away from said valve guide (16); whereby

an engine valve (14) coupled to said valve retainer (30) is biased closed by the pneumatic valve spring member (10).

5,586,530

VALVE SEAT INSERT

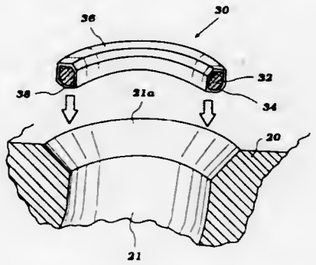
Shuhei Adachi, and Junichi Inami, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 278,026, Jul. 20, 1994. This application Jun. 7, 1995, Ser. No. 483,538

Claims priority, application Japan, Jul. 20, 1993, 5-200325; Jul. 20, 1993, 5-250559

Int. Cl.[6] F01L *3/04*

U.S. Cl. 123—188.8 **10 Claims**



1. A metallic valve seat insert for a metallic cylinder head, said valve seat insert having an opening adapted to form a flow opening registering with a cylinder head passage surrounded by a recess and an outer surface positioned to face the part of the cylinder head defining the recess, and a layer of metallic material interposed between said outer surface of said valve seat insert and the recess and physically adhered to said outer surface and capable of forming an alloy with the metal of one of said cylinder head and said valve seat insert when heated.

5,586,531

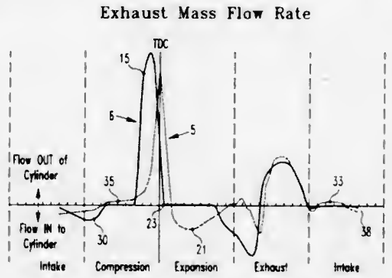
ENGINE RETARDER CYCLE

David A. Vittorio, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Nov. 28, 1995, Ser. No. 563,615

Int. Cl.[6] F02D *39/02*

U.S. Cl. 123—320 **20 Claims**



1. An engine retarder cycle for operation of an engine brake, comprising the steps of:

(a) beginning to open a retarder valve in an engine cylinder during a second half of a compression stroke of a piston in the engine cylinder;

(b) opening the retarder valve to a maximum displacement prior to a top dead center position of the piston; and

(c) closing the retarder valve during a first half of all expansion stroke of the piston.

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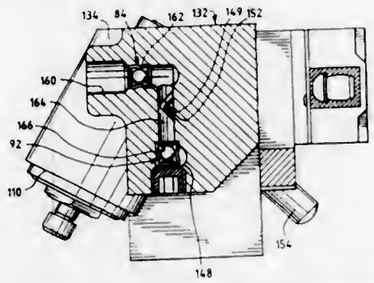
5,586,532

RECIRCULATION OF ACTUATING FLUID IN AN ENGINE BRAKING SYSTEM

James J. Faletti, Spring Valley; Dennis D. Feucht, and Scott G. Sinn, both of Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 468,937, Jun. 6, 1995, Pat. No. 5,540,201, which is a continuation of Ser. No. 282,573, Jul. 29, 1994, abandoned. This application Oct. 30, 1995, Ser. No. 550,047
Int. Cl.[6] F02D *13/04*
U.S. Cl. 123—321 **19 Claims**



1. An engine brake system for opening an engine exhaust valve, comprising:

an actuator including a slave piston having a longitudinal bore therethrough and a further bore extending from the longitudinal bore to a recess on one side of the slave piston, a valve spool disposed in the bore and having a high pressure annulus and a low pressure annulus spaced from the high pressure annulus wherein the valve spool is movable relative to the slave piston to cause the further bore to be placed in fluid communication with the high pressure annulus or the low pressure annulus, the actuator further including a high pressure inlet coupled to the high pressure annulus and a low pressure outlet coupled to the low pressure annulus; and

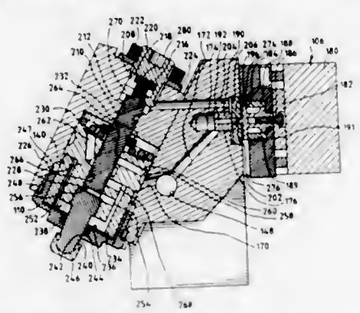
a pump having a pump inlet coupled to the low pressure outlet and a pump outlet coupled to the high pressure inlet to form a closed-loop system with the actuator.

5,586,533

ENGINE COMPRESSION BRAKING VALVE ACTUATOR APPARATUS

Dennis D. Feucht, Morton, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 468,937, Jun. 6, 1995, Pat. No. 5,540,201, which is a continuation of Ser. No. 282,573, Jul. 29, 1994, abandoned. This application Oct. 30, 1995, Ser. No. 550,268
Int. Cl.[6] F02D *13/04*
U.S. Cl. 123—321 **20 Claims**



1. An actuator for moving an engine valve to an open position, comprising:

a main body having a main body bore;

an outer sleeve disposed within the main body bore;

a slave piston disposed within the outer sleeve and having a central bore;

a master fluid control device disposed in the central bore; and

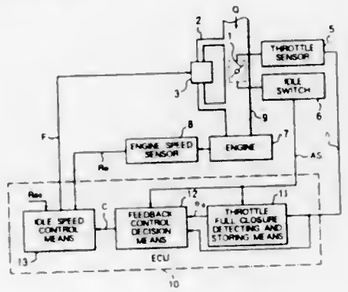
means for adjusting the axial position of the outer sleeve relative to the main body bore.

5,586,534

SYSTEM FOR DETECTING FULLY CLOSED STATE OF THE THROTTLE VALVE FOR USE IN INTERNAL COMBUSTION ENGINE

Takanori Fujimoto, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1995, Ser. No. 581,210
Claims priority, application Japan, Aug. 15, 1995, 7-208074
Int. Cl.[6] F02D *41/12;41/16*
U.S. Cl. 123—325 **4 Claims**



1. A system for detecting a fully closed state of a throttle valve for an internal combustion engine, comprising:

full-closure detecting means for detecting a fully closed state of said throttle valve of said engine;

a throttle sensor for sensing an opening degree of said throttle valve;

throttle full-closure detecting and storing means for averaging the sensed throttle opening degrees to store the averaged value as a full-closure throttle opening degree when said full-closure detecting means detects the fully closed state of said throttle valve; and

throttle valve full-closure decision means for making a decision that said throttle valve is in the fully closed condition when the fully closed state of said throttle valve is detected by said full-closure detecting means and the sensed throttle opening degree is below an opening degree threshold obtained by adding a predetermined opening degree to said full-closure throttle opening degree.

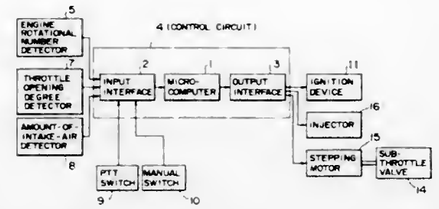
5,586,535

ENGINE ROTATIONAL NUMBER CONTROLLER

Nobuyuki Syomura, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Japan

Filed Dec. 5, 1994, Ser. No. 349,412
Claims priority, application Japan, Dec. 16, 1993, 5-343384
Int. Cl.[6] F02D *43/04;29/02*
U.S. Cl. 123—352 **5 Claims**

1. An engine rotational number controller for an outboard engine mountable on a ship body comprising means for detecting the number of rotations of an engine, means for detecting the degree of opening of a throttle of the engine, a mechanism for varying an output of the engine, means for controlling operation of said engine output varying mechanism on the basis of detection data of each of said detecting means, power trimming and tilting means



for varying a tilt angle of the outboard engine to the ship body and means for detecting cessation of operation of said power trimming and tilting means,

said controlling means comprising an engine output reduction control function for controlling operation of said engine output varying mechanism to reduce the output of the engine when the number of rotation of the engine becomes higher than a predetermined upper limit in the case where the degree of opening of the throttle is constant, and an engine output increasing control function for controlling operation of said engine output varying mechanism to increase the output of the engine when the number of rotation of the engine becomes lower than a predetermined lower limit in the case where the degree of opening of the throttle is constant, and

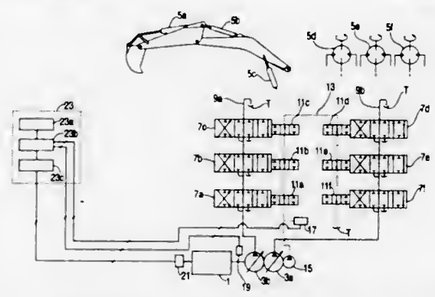
said controlling means being adapted such that the controlling operation of said engine output varying mechanism may start when said power trimming and tilting means is not operating.

5,586,536

APPARATUS FOR AND METHOD OF CONTROLLING ENGINE RPM IN HYDRAULIC CONSTRUCTION EQUIPMENT

Jeong Y. Seo, and Myung H. Song, both of Changwon, Rep. of Korea, assignors to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 29, 1995, Ser. No. 564,758
Int. Cl.[6] F02D *29/04*
U.S. Cl. 123—352 **11 Claims**



1. An engine RPM control apparatus for hydraulic construction equipment including an engine, at least one hydraulic pump driven by the engine, at least one actuator driven by the hydraulic pump, at least one main valve adapted to determine the amount and direction of fluid supplied to the actuator, and a fluid line adapted to connect, in series, the fluid pump to the main valve or at least one assistant valve manipulated in sync with the main valve, the apparatus comprising:

means for detecting an RPM of the engine;

means for controlling the engine RPM;

means for detecting a pressure in the fluid line; and

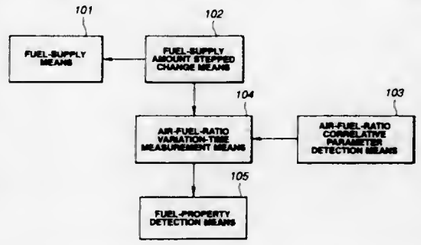
control means for determining whether the main valve is in its neutral position, through a functional computation for a pressure value detected by the pressure detecting means with a predetermined reference value, and controlling the engine RPM controlling means to decrease the engine RPM when the main valve is determined as being in its neutral position.

5,586,537

FUEL PROPERTY DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Naoki Tomisawa, and Satoru Watanabe, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

PCT No. PCT/JP95/00307, § 371 Date Oct. 25, 1995, § 102(e) Date Oct. 25, 1995, PCT Pub. No. WO95/23285, PCT Pub. Date Aug. 31, 1995
PCT Filed Feb. 28, 1995, Ser. No. 532,822
Claims priority, application Japan, Feb. 28, 1994, 6-029312
Int. Cl.[6] F02D *45/00*
U.S. Cl. 123—435 **12 Claims**



1. A fuel-property detecting apparatus for an internal combustion engine comprising:

fuel-supply means for supplying fuel into an intake system of an engine;

fuel-supply amount stepped change means for forcibly changing a fuel-supply amount generated from said fuel-supply means in a stepped manner;

air-fuel-ratio correlative parameter detection means for detecting an engine-operation state indicative parameter correlated with an air-fuel ratio of air-fuel mixture introduced into a cylinder of the engine;

air-fuel-ratio variation-time measurement means for measuring a time period from a time when a stepped change in said fuel-supply amount generated from said fuel-supply means occurs to a time when a change in said air-fuel ratio of air-fuel mixture introduced into said cylinder, based on said stepped change, is detected by said air-fuel-ratio correlative parameter detection means; and

fuel-property detection means for setting a parameter indicative of a fuel property on the basis of said time period measured by said air-fuel-ratio variation-time measurement means.

5,586,538

METHOD OF CORRECTING ENGINE MAPS BASED ON ENGINE TEMPERATURE

Travis E. Barnes, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 13, 1995, Ser. No. 555,468
Int. Cl.[6] F02M *37/04;7/00*
U.S. Cl. 123—446 **12 Claims**

1. A method for electronically controlling the quantity of fuel that a hydraulically-actuated injector dispenses into an engine, the method comprising the steps of:

storing a plurality of engine operating curves;

sensing the temperature of the engine and producing an engine temperature signal T_e indicative of the temperature of the actuating fluid used to hydraulically actuate the injector; and

receiving the engine temperature signal T_e and modifying at least one of the engine operating curves in response to the sensed engine temperature.

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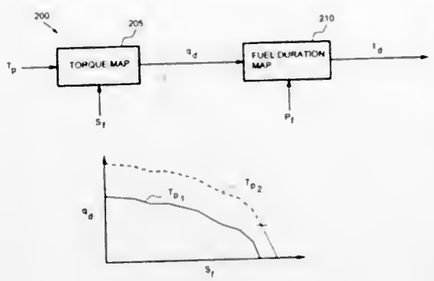
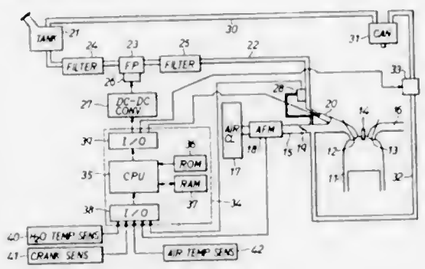


5,586,539

FUEL SUPPLYING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Masao Yonekawa, Kariya; Kazuji Minagawa, Tokoname; Kiyotoshi Oi, Toyohashi; Makoto Miwa, Kariya, and Yoshihiro Majima, Ohu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 1, 1995, Ser. No. 587,447
Claims priority, application Japan, Dec. 20, 1994, 6-315426
Int. Cl.[6] F02M *37/08*
U.S. Cl. 123—458 **16 Claims**



1. A fuel supplying apparatus for an internal combustion engine that supplies fuel from a fuel tank to an injector by using a fuel pump and injects fuel from the injector into the engine, the apparatus comprising:

variable speed driving means for variably controlling pumping pressure of the fuel pump;

temperature information detecting means for detecting information regarding fuel temperature;

fuel pressure control means for controlling the variable speed driving means so that the pressure of fuel to be injected by the injector becomes substantially equal to a fuel pressure determined in accordance with an operating condition of the engine and the information regarding fuel temperature detected by the temperature information detecting means;

fuel injection timing determining means for determining whether fuel injection end timing is earlier than intake valve opening timing;

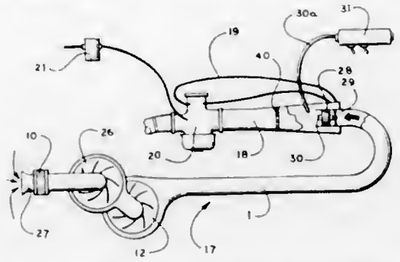
wherein the fuel pressure control means includes means for controlling the variable speed driving means so that when the injection timing determining means determines that the fuel injection end timing is later than the intake valve opening timing, the pressure of fuel to be injected becomes substantially equal to a fuel pressure that allows the fuel injection end timing to become earlier than the intake valve opening timing.

5,586,540

MULTIPLE STAGE SUPERCHARGING SYSTEM

Steven E. Marzec, and Willy Marzec, both of 5761 Musket La., Stone Mountain, Ga. 30087

Filed Aug. 29, 1995, Ser. No. 521,297
Int. Cl.[6] F02B *33/40;39/10*
U.S. Cl. 123—559.1 **21 Claims**



1. A multiple stage supercharging system for an internal combustion engine, the engine having a carburetor with an air intake snorkel, a gas tank, a magnetic flywheel, and a crankcase, the supercharging system comprising:

a backing plate attached to the crankcase of the engine,

a centrifugal compressor housing having an air intake and an outlet, the centrifugal compressor housing mounted on the backing plate,

a centrifugal compressor wheel attached to the magnetic flywheel of the engine, the centrifugal compressor wheel positioned inside the centrifugal compressor housing,

air filter means for filtering ambient air entering the air intake of the centrifugal compressor housing,

a secondary plenum chamber having an inlet and an outlet, the inlet mating with the outlet of the centrifugal compressor housing,

a d.c. motor driven axial compressor having an inlet and an outlet, the inlet mating with the outlet of the secondary plenum chamber,

a primary plenum chamber having an inlet and an outlet, the inlet mating with the outlet of the d.c. motor driven axial compressor, the outlet of the primary plenum chamber mating with the air intake snorkel to the carburetor,

a pressure equalization tube extending from the primary plenum chamber to the carburetor,

an electric fuel pump having a first line and a second line, the first line connected to the gas tank and the second line connected to the carburetor,

alternator means for producing alternating current from the rotation of the magnetic flywheel, the alternator means surrounding the magnetic flywheel, and

alternating current to direct current conversion means for converting the current from the alternator to a direct current, the direct current connecting to the d.c. motor driven axial compressor.

5,586,541

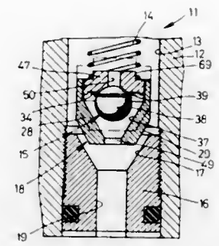
AUXILIARY ASSEMBLY FOR IMPROVING THE COMBUSTION EFFICIENCY OF AN ENGINE

Chun-Tie Tsai, P.O. Box 96-405, Taipei 10098, Taiwan

Filed Aug. 7, 1995, Ser. No. 512,126
Int. Cl.[6] F02M *25/06*
U.S. Cl. 123—574 **10 Claims**

1. An auxiliary air intake valve assembly for increasing the combustion efficiency of an engine having an intake manifold comprising:

a body portion having a first end connected to the intake manifold, through a connecting terminal a second end connected to a filter, a center hole between said filter and said connecting terminal one end of said center hole having internal threads



and a cylindrical surface, said connecting terminal having a through hole and a top side for receiving a spring; a first valve body and a first valve seat located in said center hole, said first valve seat mounted in said center hole by engagement with the internal threads;

a first spring, located in said center hole having a first end pushing against said top side in said center hole, and a second end thereof pushing against a positioning stud of said first valve body so as to bias said first valve body towards said first valve seat;

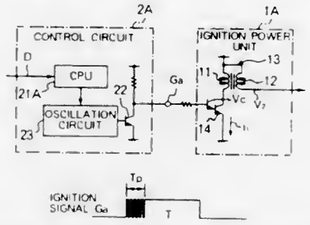
said first valve body having a first valve surface configured to be in contact with a conic surface of said first valve seat; an inner opening bounded by a conic, second valve seat having an intake hole communicating with the inner opening; a third valve seat attached to said first valve body and facing into said inner opening; a valve ball located in the inner opening; a second spring extending between said third valve seat and said valve ball to bias the valve ball toward said conic second valve seat whereby a low vacuum in the intake manifold above a first predetermined value will open the valve ball enabling air to pass through the first valve body into the intake manifold and when the vacuum reaches a second predetermined value the valve ball engages the third valve seat and the first valve body is displaced away from the first valve seat.

5,586,542

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Masaaki Taruya, and Mitsuru Koiwa, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1995, Ser. No. 569,987
Claims priority, application Japan, Mar. 31, 1995, 7-076159
Int. Cl.[6] F02P *3/04;11/00*
U.S. Cl. 123—609 **2 Claims**



1. An ignition apparatus for an internal combustion engine comprising:

an ignition power unit having an ignition coil and a power transistor for supplying and shutting off a primary current to the ignition coil; and

a control circuit for determining an ignition timing of said internal combustion engine and a period for supply of said primary current in accordance with driving conditions of said internal combustion engine so that it generates an ignition signal in the form of a pulse to said power transistor, said primary current being supplied and shut off by said power transistor in accordance with said ignition signal so that a high-tension secondary voltage is produced from said ignition coil;

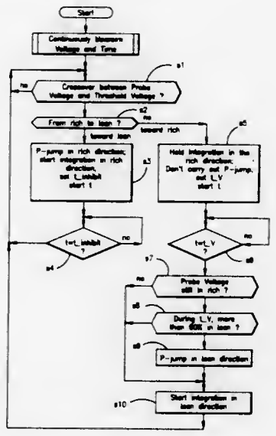
said control circuit comprising an oscillation circuit which starts to operate from a point when said ignition signal rises, and continues to operate for a predetermined period shorter than a pulse width of said ignition signal, the waveform of said ignition signal thereby being made to rise substantially gradually.

5,586,543

MIXTURE CONTROLLER FOR AN INTERNAL COMBUSTION ENGINE

Eberhard Schnaibel, Hemmingen; Lothar Raff, Remseck, and Klaus Hirschmann, Leonberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 17, 1995, Ser. No. 372,937
Claims priority, application Germany, Jan. 21, 1994, 44 01 661.1
Int. Cl.[6] F02D *41/14*
U.S. Cl. 123—696 **7 Claims**



1. A mixture controller for adjusting an output value, which is outputted by a PI two-point controller, to control the air/fuel ratio of a mixture supplied to an internal combustion engine to a pregiven value, the engine producing an exhaust-gas flow during operation and having an oxygen probe mounted in the exhaust-gas flow, the mixture controller comprising:

(a) detecting means for continuously detecting the signal of said oxygen probe to obtain sequential measurement values of said signal;

(b) checking means for checking whether a currently detected measurement value of said signal has crossed over a threshold value in the lean or rich direction compared to the previously detected measurement value of said signal;

(c) first changing means for changing said output value when a crossover of said signal in the lean direction is present by shifting said output value with a large step via a P-jump in the rich direction and starting an integration of said output value in the rich direction from a previous lean direction;

(c') second changing means for changing said output value when a crossover of said signal in the rich direction is present by stopping said integration of said output value in the rich direction and starting an integration in the lean direction after a pregiven delay time has elapsed;

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(d) return means for returning the operation of said mixture controller to said checking means after either said first changing means or said second changing means has changed said output value; and,

(e) inhibit means for inhibiting a return of the operation of the mixture controller from said first changing means or said second changing means to said checking means until an inhibit time has elapsed.

5,586,544

FUEL INJECTION AMOUNT CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES AND INTAKE PASSAGE WALL TEMPERATURE-ESTIMATING DEVICE USED THEREIN

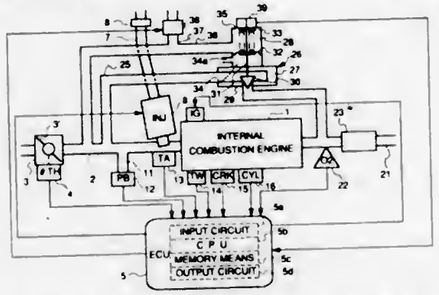
Toru Kitamura; Akira Katoh; Katsuhiro Kumagai; Sachito Fujimoto; Hiroshi Kitagawa; Shunichi Tsuzuki; Jun Takahashi, and Masami Watanabe, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 351,210

Claims priority, application Japan, Nov. 30, 1993, 5-325831; Dec. 16, 1993, 5-343761; Dec. 16, 1993, 5-343762

Int. Cl.[6] F02D *41/06;41/14;41/32*

U.S. Cl. 123—684 **32 Claims**



1. In a fuel injection amount control system for an internal combustion engine having an intake passage, said intake passage having a wall surface, at least one fuel injection valve, and at least one combustion chamber, including first fuel amount-calculating means for calculating a first amount of fuel directly drawn into said at least one combustion chamber out of an amount of fuel injected into said intake passage via said at least one fuel injection valve, second fuel amount calculating means for calculating a second amount of fuel carried off fuel adhering to said wall surface of said intake passage into said at least one combustion chamber, fuel injection amount-calculating means for calculating an amount of fuel to be injected into said intake passage, based on said first amount of fuel and said second amount of fuel, air-fuel ratio detecting means for detecting an air-fuel ratio of exhaust gases from said engine, air-fuel ratio correction amount-calculating means for calculating an air-fuel ratio correction amount, based on an output from said air-fuel ratio-detecting means, and air-fuel ratio correcting means for correcting said amount of fuel to be injected into said intake passage by said air-fuel ratio correction amount,

the improvement comprising carried-off fuel amount-correcting means for correcting said second fuel amount, based on said air-fuel ratio correction amount; and

driving means for driving said at least one fuel injection valve in order to supply said corrected amount of fuel to be injected to said intake passage, wherein said carried-off fuel amount-correcting means includes carried-off fuel amount correction coefficient-setting means for setting a carried-off fuel amount correction coefficient such that said carried-off fuel amount correction coefficient assumes a smaller value as said air-fuel ratio correction amount is larger, said carried-off fuel amount-correcting means correcting said second amount of fuel by said carried-off fuel amount correction coefficient.

3. A fuel injection amount control system for an internal combustion engine having an intake passage, said intake passage having a wall surface, at least one fuel injection valve, at least one combustion chamber, and an exhaust passage, comprising:

first fuel amount-calculating means for calculating a first amount of fuel directly drawn into said at least one combustion chamber and burned therein out of an amount of fuel injected into said intake passage via said at least one fuel injection valve;

second fuel amount-calculating means for calculating a second amount of fuel directly drawn into said at least one combustion chamber and exhausted therefrom without being burned therein out of said amount of fuel injected into said intake passage via said at least one fuel injection valve;

third fuel amount-calculating means for calculating a third amount of fuel carried off fuel adhering to said wall surface of said intake passage into said at least one combustion chamber;

fuel injection amount-calculating means for calculating an amount of fuel to be injected into said intake passage, based on said first amount of fuel, said second amount of fuel and said third amount of fuel; and

driving means for driving said at least one fuel injection valve in order to supply said calculated amount of fuel to be injected to said intake passage.

11. An intake passage wall surface temperature-estimating device for an internal combustion engine having an intake passage, said intake passage having a wall surface, comprising:

coolant temperature-detecting means for detecting a temperature of coolant circulating through said engine;

intake air temperature-detecting means for detecting a temperature of intake air in said intake passage of said engine; and

intake passage wall surface temperature-estimating means for estimating a temperature of said wall surface of said intake passage, based on said coolant temperature detected by coolant temperature-detecting means and said temperature of said intake air in said intake passage detected by said intake air temperature-detecting means, at an intermediate temperature between said coolant temperature and said temperature of said intake air.

5,586,545

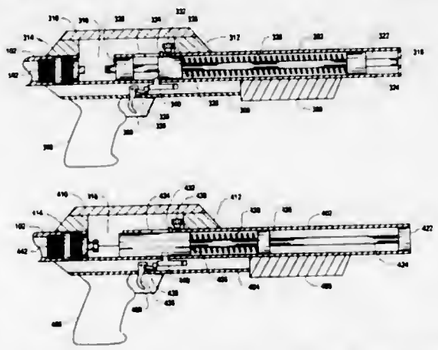
COMPRESSED GAS GUN

John A. McCaslin, 4104 Steeplewood Ct., Arlington, Tex. 76016

Filed Oct. 2, 1995, Ser. No. 537,528

Int. Cl.[6] F41B *11/00*

U.S. Cl. 124—73 **14 Claims**



1. A compressed gas gun operable to be coupled to a compressed gas tank and for propelling a projectile under force of compressed gas expelled though an outlet fitting on the compressed gas tank, said air gun comprising:

a frame having a muzzle end and a breech end;

a first barrel guide, having a housing, attached to said frame at a point closer to said muzzle end than said breech end, and

wherein said first barrel guide has a compression sleeve disposed between said housing and said barrel for supporting said barrel and allowing said barrel to slide with respect to said frame;

a second barrel guide attached to said frame at a point closer to said breech end than said first barrel guide;

a barrel having a breech and having a cocking pawl attached thereto, said barrel being slidable mounted along the longitudinal axis of said barrel by said first barrel guide and said second barrel guide;

a valve assembly having an inlet fitting for connecting to the outlet fitting on the compressed gas tank and having a gas port for expelling compressed gas upon actuation of said valve assembly, said valve assembly attached to said frame at a position aligning said gas port with said breech of said barrel;

a spring disposed between said frame and said barrel, exerting force to urge said barrel to slide toward said breech end of said frame thereby forcing said breech of said barrel to impact said valve assembly and seal against said gas port, and

a trigger assembly attached to said frame and operable to engage said cocking pawl and retain said barrel at a position away from said valve assembly, and wherein activation of said trigger assembly releases said cocking pawl thereby allowing said spring to urge said barrel against said valve assembly, expelling compresses gas through said gas port, into said breech of said barrel, and propelling the projectile.

5,586,546

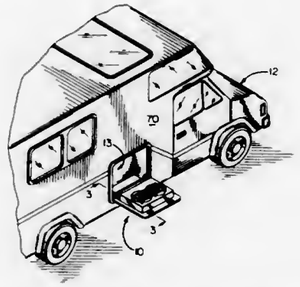
FOLD-AWAY GAS APPLIANCE

Walter M. Ashcraft, Rockford, and Matthew A. Wales, South Beloit, both of Ill., assignors to Atwood Industries, Inc., Rockford, Ill.

Filed Jul. 24, 1995, Ser. No. 506,366

Int. Cl.[6] F24C *3/12*

U.S. Cl. 126—42 **12 Claims**



1. A fold-away gas appliance for a recreational vehicle having a sidewall with an opening therein, the appliance comprising a storage compartment located in the opening, a cooking unit supported by the compartment for pivotal movement to swing downwardly and upwardly between an upright storage position located in the compartment and a generally horizontal exposed position extending outwardly from the sidewall, the cooking unit having a gas burner and having a cut-off valve disposed for operating movement between open and closed positions to establish and cut off the flow of gas to the burner, an actuator operably linking the pivotal movement of the cooking unit with the operating movement of the cut-off valve for moving the valve between the open and closed positions, and bracket means connecting the storage compartment to the cooking unit and linked to the cut-off valve for shifting the actuator in a first direction relative to the cooking unit to move the valve toward the closed position as the cooking unit is swung upwardly toward the storage position and in a second direction relative to the cooking unit to move the valve toward the open position as the cooking unit is swung downwardly toward the exposed position.

5,586,547

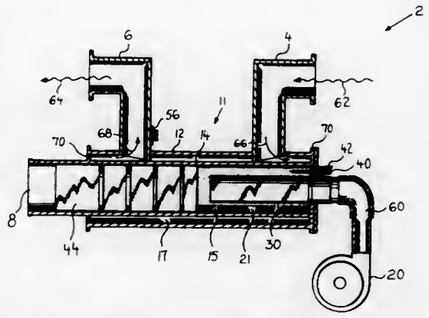
INSTANTANEOUS GAS WATER HEATER

Austin D. Nixon, 1500 Airway Cir., New Smyrna Beach, Fla. 32168

Filed Jan. 13, 1995, Ser. No. 372,500

Int. Cl.[6] F24H *1/00*

U.S. Cl. 126—351 **17 Claims**



1. An instantaneous gas water heater comprising:

a control panel comprising gas solenoid valve electrically connected to an electronic controller, and a blower operation providing means electrically connected to said electronic controller;

a blower section comprising a blower electrically connected to said electronic controller, said blower communicating with a gas/air mixing chamber and with said blower operation proving means, said gas/air mixing chamber communicating with said gas solenoid valve; and

a heat transfer section comprising an inner jacket, the space within said inner jacket defining a combustion chamber, a baffle disposed within said combustion chamber, a gas/air combustion means communicating with said gas/air mixing chamber disposed within said combustion chamber, an ignition means disposed within said combustion chamber, and an outer jacket enclosing said inner jacket, space between said inner jacket and said outer jacket defining a water sleeve, said gas/air combustion means comprising a powered burner comprising a venturi tube communicating with said gas/air mixing chamber, venturi tube holes in said venturi tube, and a mantle enclosing said venturi tube, the mantle's shape matching the inner jacket's shape.

5,586,548

FLOATING SOLAR HEATER FOR POOL WATER

Chih-Yu Hsia, 301 Warren Wy., Arcadia, Calif. 91006

Filed Feb. 28, 1995, Ser. No. 395,715

Int. Cl.[6] F24J *2/42*

U.S. Cl. 126—565 **4 Claims**

1. A solar heater in combination with a water pool, comprising:

a) a float having an upper side and a lower side,

b) a solar heat collecting first plate spaced above said upper side of the float,

c) heat radiating means spaced below the lower side of the float, to contact pool water, and

d) heat transfer means extending through the float and between said heat collecting plate and said heat radiating means, for transferring heat by conduction from the plate to said means, to enable collected solar heat transfer to the pool water,

e) said heat transfer means comprising a plurality of metallic elements, which are spaced apart, said float having plastic float material and a plurality of separate and individual openings through the plastic float material below said plate and passing said metallic elements,

f) and wherein said metallic elements hang from said plate and extend downwardly through and spaced from a sidewall of

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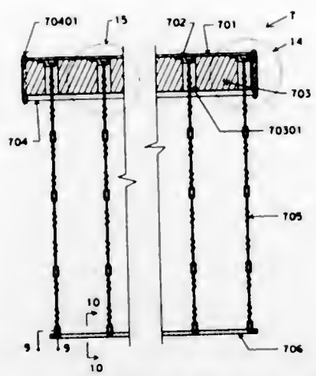


said openings and substantially below the float lower side to be suspended by the float for contact with pool water at a depth therein below the float,

g) said float suspended by water in the pool, whereby said metallic elements are floatingly suspended in and by said water pool.

5,586,549

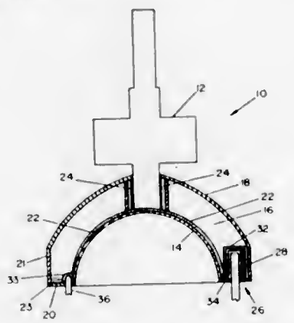
COMBINED SOLAR AND GAS HEATER

John R. Hartenstine, Landisville, and Peter M. Dussinger, Lititz, both of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Jan. 3, 1996, Ser. No. 582,386

Int. Cl.[6] F24J *2/32*

U.S. Cl. 126—635 **8 Claims**



1. In a solar collector assembly of the type which includes a solar heat pipe formed as a sealed enclosure, with one wall of the solar heat pipe being a solar collector which has a solar evaporator wick on the surface of the solar collector wall within the solar heat pipe; a heat utilization device acting as the condenser of the solar heat pipe; capillary means delivering condensed liquid from the condenser to the solar evaporator wick; a fuel burning heater to furnish auxiliary heat to the solar heat pipe; a combustion chamber enclosing the fuel burning heater; a fuel delivery means supplying fuel and air to the heater; and an exhaust means open to the interior of the combustion chamber to exhaust combustion products from the burner; the improvement comprising:

the combustion chamber including at least one surface which is heated by the fuel burning heater, with the heated surface including a first side within the combustion chamber and a second side outside the combustion chamber;

a burner evaporator wick attached to the second side of the heated surface; and

a heat pipe enclosing the burner evaporator wick on the second side of the surface, with the heat pipe removing heat from the combustion chamber and with the heat pipe including a condenser section to condense evaporated vapor and a delivery means to supply liquid condensed within the condenser section to the burner evaporator wick further including:

at least one cavity formed in a wall of the solar heat pipe enclosure other than the solar collector wall, with the cavity forming the combustion chamber and having at least one surface exposed within the solar heat pipe; and

the burner evaporator wick being located within the solar heat pipe and covering a surface of the cavity which is exposed within the solar heat pipe, so that the solar heat pipe is the heat pipe enclosing the burner evaporator wick.

5,586,550

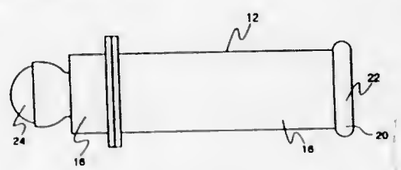
APPARATUS AND METHODS FOR THE DELIVERY OF THERAPEUTIC LIQUIDS TO THE RESPIRATORY SYSTEM

Yehuda Ivri, Irvine, and Cheng H. Wu, Sunnyvale, both of Calif., assignors to Fluid Propulsion Technologies, Inc., Santa Clara, Calif.

Filed Aug. 31, 1995, Ser. No. 521,641

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.16 **47 Claims**



1. An apparatus for nebulizing a liquid, the apparatus comprising:

a non-planar member comprising a front surface, a rear surface, and a plurality of apertures extending therebetween, said apertures being tapered to narrow from the rear surface to the front surface;

a liquid supplier which delivers liquid to the rear surface such that substantially all of the delivered liquid adheres to the non-planar member by surface tension; and

a vibrator which vibrates the non-planar member to eject liquid droplets from the front surface of the member.

5,586,551

OXYGEN MASK WITH NEBULIZER

Kenneth R. Hilliard, 2840 Gibbs-Williams Rd., Dallas, Tex. 75233

Filed Jul. 17, 1995, Ser. No. 503,327

Int. Cl.[6] A61M *11/00*

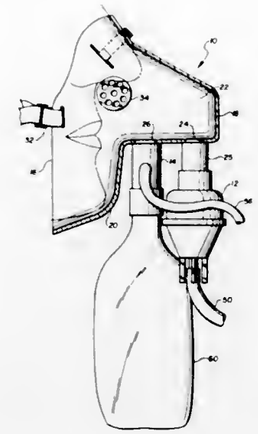
U.S. Cl. 128—203.29 **6 Claims**

1. A respiratory therapy mask comprising:

a mask portion defining a cavity having an opening, said cavity and said opening being dimensioned and configured for said opening to sealingly contact a patient's face and for said cavity to form an enclosed space about the patient's nose and mouth, said mask portion further having a first one-way inlet valve and a second one-way inlet valve;

a first main breathable gas supply assembly communicates with said first inlet valve for supplying a first breathable gas to a patient; and

a nebulizer assembly removably attached to said second inlet valve and supplies an inhalable medication entrained in a second breathable gas to said mask portion, said nebulizer assembly includes:



a nebulizer bottle in the form of a container containing a jet with a centered nozzle, said nozzle receiving said second breathable gas from a secondary gas source, whereby the breathable gas from said secondary gas source issues as a jet stream;

a jet housing fitting over said jet and creating an annular gap between said jet housing and said jet, the inhalable medication in liquid form filling said annular gap and reaching the nozzle of said jet, the inhalable medication becomes being entrained in the breathable gas from said secondary gas source issuing from said nozzle; and

a nebulizer connector removably attached to said nebulizer bottle, said nebulizer connector containing a baffle centered said nebulizer connector, said baffle which disperses the second breathable gas from said secondary gas source issuing from said nozzle and having inhalable medication entrained therein into the gas jet stream, and said nebulizer connector having an outlet in communication with said second inlet valve;

whereby a patient can receive a prescribed dosage of medication simultaneously with the first breathable gas to prevent hypoxia and shortness of breath.

5,586,552

PHYSICAL-INFORMATION DETECTING SYSTEM

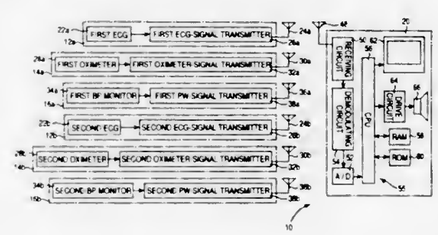
Hiroshi Sakai, Komaki, Japan, assignor to Colin Corporation, Komaki, Japan

Filed Nov. 16, 1994, Ser. No. 341,989

Claims priority, application Japan, Nov. 29, 1993, 5-298385

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **19 Claims**



1. A physical-information detecting system comprising:

a first detector which detects a first physical information of a living subject and generates a first physical-information signal representing the detected first physical information;

a second detector which detects a second physical information of said living subject and generates a second physical-information signal representing the detected second physical information;

a first transmitter which transmits said first physical-information signal, and a first identification signal identifying said first detector;

a second transmitter which transmits said second physical-information signal, and a second identification signal identifying said second detector;

a physical-information output device which receives said first and second physical-information signals and said first and second identification signals, from said first and second transmitters, and outputs said detected first physical information represented by said first physical-information signal and said detected second physical information represented by said second physical-information signal;

determining means for determining a characteristic of change of each of said first and second physical-information signals; and

judging means for judging whether said first and second detectors are located on the same living subject based on the respective determined characteristics of said first and second physical-information signals, said judging means providing a positive judgment when said respective determined characteristics are substantially identical with each other.

5,586,553

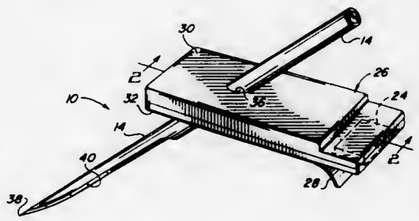
TRANSCUTANEOUS SENSOR INSERTION SET

Edgardo C. Halili, Reseda, and John J. Mastrototaro, Los Angeles, both of Calif., assignors to MiniMed Inc., Sylmar, Calif.

Filed Feb. 16, 1995, Ser. No. 393,148

Int. Cl.[6] A61B *5/05*

U.S. Cl. 128—635 **21 Claims**



1. A transcutaneous sensor insertion set, comprising:

a mounting base adapted for mounting onto a patient's skin;

a flexible sensor having a proximal segment carried by said mounting base, and a distal segment protruding from said mounting base and having at least one sensor electrode thereon;

a cannula protruding from said mounting base and having said sensor distal segment therein, said cannula defining at least one window disposed generally in alignment with said at least one sensor electrode on said sensor distal segment; and

a hollow insertion needle carried by said mounting base to protrude therefrom and having at least a portion of said cannula nested therein, said insertion needle defining a longitudinally extending slot along one side thereof to permit sliding withdrawal of said needle from said mounting base and said nested portion of said cannula.

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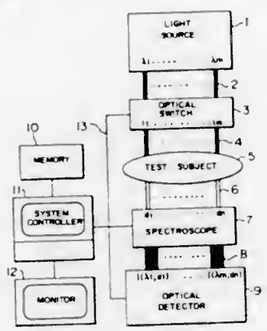
5,586,554

OPTICAL SYSTEM FOR MEASURING METABOLISM IN A BODY

Atsushi Maki, Hachioji; Fumio Kawaguchi, Tokyo; Yuichi Yamashita, Hachioji, and Yoshitoshi Ito, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,749
Claims priority, application Japan, Feb. 23, 1993, 5-033018
Int. Cl.[6] A61B *5/05*
U.S. Cl. 128—653.1 **34 Claims**



1. An optical system for measuring metabolism in a test subject by irradiating rays of light from a light source to the inside of the test subject and detecting rays of light passing from inside of the test subject so as to obtain information about the inside of the test subject, said optical system comprising:

irradiating means for receiving from the light source light having a plurality of wavelengths and irradiating plural rays of the light onto plural irradiation spots on the test subject, with each of the irradiation spots receiving a light ray of a different wavelength;

means for detecting rays of light passing from the inside of the test subject at plural detecting spots on the test subject; and

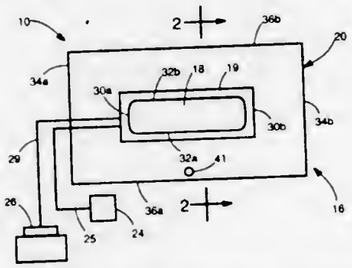
first separating means for separating the detected rays of light by wavelength.

5,586,555

BLOOD PRESSURE MONITORING PAD ASSEMBLY AND METHOD

Donald E. Bobo, Jr., Orange, and Thomas H. Doupe, Huntington Beach, both of Calif., assignors to Innerspace, Inc., Santa Ana, Calif.

Filed Sep. 30, 1994, Ser. No. 316,555
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—672 **36 Claims**



1. A pad assembly for use in a system for obtaining certain information about the blood pressure of a given person by a particular blood pressure technique in which a pressurizable pressure transducing bladder is supported on the skin of the person adjacent to and in cooperation with a particular target artery in combination with means for pressurizing the bladder in a controlled way, said pad assembly comprising:

a) said pressure transducing bladder; and

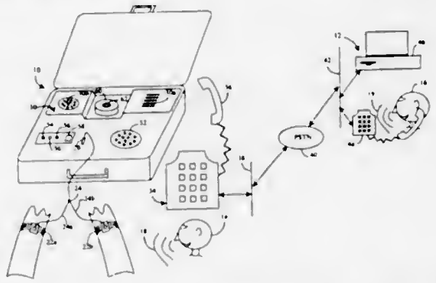
b) support means including adhesive tape for fixably supporting said bladder in place against the skin adjacent the target artery so that the bladder is in direct contact with the skin and said adhesive tape is directly attached to a portion of the skin adjacent the bladder, said support means further including movement means configured to move at least to a limited extent within a release zone in response to the pressurization of said bladder in a way which prevents said adhesive tape from detaching from the skin as the bladder is pressurized.

5,586,556

PACEMAKER AND HEART MONITORING AND DATA TRANSMITTING DEVICE AND METHOD

Thomas R. Spivey, West Linn, and Byron G. Zahler, Portland, both of Oreg., assignors to T Z Medical, Inc., Lake Oswego, Oreg.

Filed May 11, 1995, Ser. No. 438,688
Int. Cl.[6] A61B *5/04*
U.S. Cl. 128—697 **13 Claims**



1. A pacemaker monitor transmitter device for coupling to a patient having a pacemaker and interacting with a remote station including a remote operator, the device comprising:

a telephonic communication channel delivering a pacemaker monitor transmitter device generated signal and a patient voice signal into a telephone connection and receiving from said telephone connection a remote signal including a command signal and a remote operator voice signal;

an electrode pair attachable to said patient and providing a patient signal; and

a patient signal processing element receiving said patient signal in analog form, converting said patient signal to digital form, and providing said patient signal to said telephonic channel in frequency modulated form as said device generated signal.

5,586,557

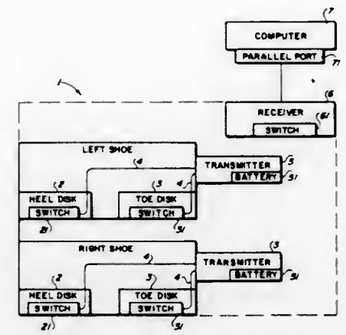
FUNCTIONAL AMBULATION PERFORMANCE SCORING DEVICE

Arthur J. Nelson, New York, and Clifford M. Gross, Roslyn, both of N.Y., assignors to BCAM International, Inc., Melville, N.Y.

Filed May 31, 1994, Ser. No. 251,596
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—779 **18 Claims**

1. For use with a walking surface and left and right feet, a device for measuring human ambulation comprising:

(a) a left foot sensor capable of sensing when the left foot is in contact with the walking surface, the left foot sensor being activated when such contact occurs;



(b) a right foot sensor capable of sensing when the right foot is in contact with the walking surface, the right foot sensor being activated when such contact occurs;

(c) a processor having an algorithm to create an ambulation index reflective of a quantitative analysis of human ambulation;

(d) left transmission means for indicating to the processor when the left foot sensor is activated;

(e) right transmission means for indicating to the processor when the right foot sensor is activated; and

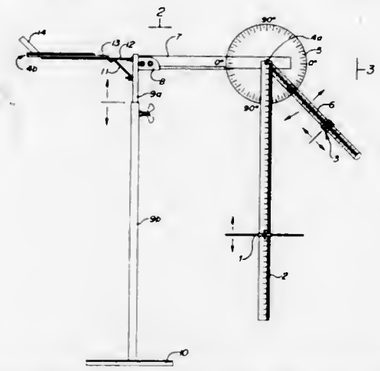
(f) output means to output the ambulation index from the processor.

5,586,558

OPTIMIZER MEASURING UNIT

David R. Riley, Russellville, Ark., assignor to Stanley E. Gately, and Catherine G. Gately, both of Russellville, Ark.

Filed Sep. 2, 1994, Ser. No. 300,485
Int. Cl.[6] A61B *5/10*
U.S. Cl. 128—781 **9 Claims**



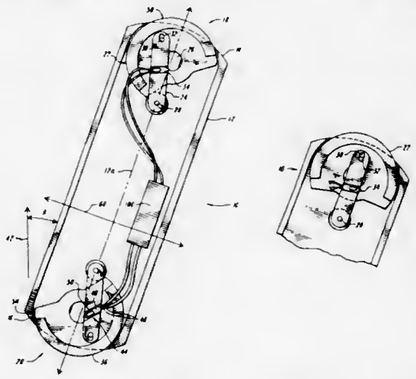
1. In a measuring device used for determining bone lengths and degree angles of the skeletal system of a human body for purposes of determining natural ranges of motion of any specific individual as used in ergonomics, fitness and job safety; a base plate from which a stand extends upwardly, said stand comprising a vertical column attached to said base plate and that has a square tube in said column that extends and adjusts the height of said stand, said square tube having a right support arm that extends right from said square tube, and at the end of said right support arm is a fixed plexiglass disc with black graduations etched on the surface for obtaining degree angles and length measurements of the upper extremities of the human body, further wherein said disc is affixed to said right support arm at a center point which is a point of origin from which all measurements originate and which is the top of the sternoclavicular joint of the human body, and further pivotally affixed to said center point is a plexiglass radial dial arm used in obtaining degree angles of the elbow radius and length measurements of the human body, further attached to said radial dial arm is an aluminum slide that slides along said radial dial arm to indicate the measurements of the human body.

5,586,559

ARTHROMETER WITH GRAVITY SWITCHES AND ADJUSTABLE LIMIT SIGNALING

Kevin R. Stone, 1 Throckmorton La., Mill Valley, Calif. 94941; Perry A. Klebahn, 2633 Steiner St., San Francisco, Calif. 94115, and William R. Knapp, 116 Gilbert St., Menlo Park, Calif. 94025

Continuation of Ser. No. 992,059, Dec. 17, 1992, Pat. No. 5,394,888. This application Mar. 6, 1995, Ser. No. 398,527
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—782 **20 Claims**



19. An arthrometer for monitoring an angle of flexure of an elongated body limb with respect to the portion of the body to which the limb is attached, comprising:

A. an elongated housing extending along a principal axis,

B. means for detachably coupling said housing to the limb whereby said principal axis is at a fixed orientation with respect to a central axis of the limb,

C. first limit sensor affixed to said housing including:

i. a first gravity-actuated switch coupled to said housing and responsive to orientation relative to a vertical axis, so that said first switch is in a first state when said first switch is oriented within a first range of orientations, and said first switch is in a second state when said first switch is oriented within a second range of orientations,

ii. first switch positioning assembly including first vernier means for adjustably orienting said first switch with respect to said principal axis with a sensitivity reduction greater than 1:1, whereby said first switch is in its first state when said principal axis is oriented within a first predetermined range of orientations measured with respect to the vertical axis and in its second state otherwise, and

D. second limit sensor affixed to said housing including:

i. a second gravity-actuated switch coupled to said housing and responsive to orientation relative to the vertical axis, so that said second switch is in a first state when said second switch is oriented within a third range of orientations, and said second switch is in a second state when said second switch is oriented within a fourth range of orientations, and

ii. second switch positioning assembly including second vernier means for adjustably orienting said second switch with respect to said principal axis with a sensitivity reduction greater than 1:1, whereby said second switch is in its first

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state when said principal axis is oriented within a second predetermined range of orientations measured with respect to the vertical axis and in its second state otherwise.

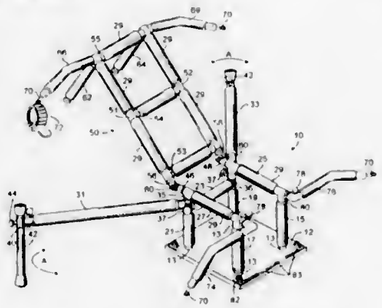
interconnecting means for directly attaching each of the plurality of curved plates one to another for maintaining the continuous tunnel between at least two adjacent ones of the plurality of curved plates.

5,586,560

COLLAPSIBLE SEATING APPARATUS

David Boutos, 4420 Dunlap Crossing St., Las Vegas, Nev. 89129

Filed Jan. 5, 1995, Ser. No. 368,907
Int. Cl.[6] A61G *15/00;* **A47C** *3/00*
U.S. Cl. 128—845 **9 Claims**



1. A seating apparatus, said apparatus comprising:

a base;

a plurality of support members rising up from said base, said support members supporting two transverse horizontal members which form a seating surface for one person;

supports for resting one's legs rotatably mounted at the front of said transverse horizontal members; and

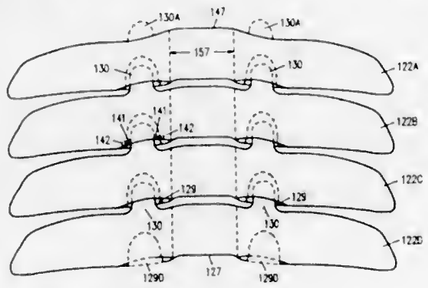
a seat back attached to the rear of said transverse horizontal members.

5,586,561

BACK GUARD WITH TUNNEL FOR SPINAL COLUMN

Shreve M. Archer, III, Carmel Valley, Calif., assignor to Entropy Racing, Inc., Monterey, Calif.

Continuation-in-part of Ser. No. 163,906, Dec. 6, 1993, Pat. No. 5,400,801. This application Sep. 7, 1994, Ser. No. 301,891
Int. Cl.[6] A61F *5/37*
U.S. Cl. 128—846 **8 Claims**



1. A back guard comprising:

a plurality of curved plates having inner contours, the plurality of curved plates aligned with one another for forming a continuous tunnel, the continuous tunnel, defined by the inner contours, for corresponding to at least a portion of a human spine, the continuous tunnel having a height along at least a portion thereof of at least 3 cm; and

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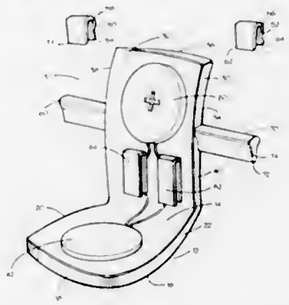
5,586,562

DEVICE FOR SENSING AND TREATING BRUXISM

Warren W. Matz, 882 U.S. Highway 1, Juno Beach, Fla. 33408

Filed Jul. 14, 1995, Ser. No. 502,681
Int. Cl.[6] A61F *5/56*
U.S. Cl. 128—848 **17 Claims**



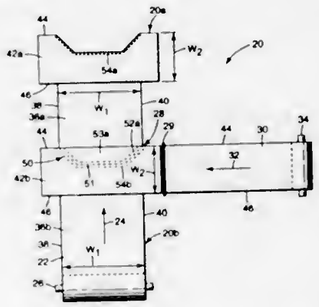
1. An anti-bruxism device comprising: an L-shaped support means defined by a substantially vertical mounting section and a substantially horizontal biting section, said support means having a width and a length with an inner surface and an outer surface defining a thickness therebetween; and a mounting means bonded to at least one tooth for releasably securing said support means to a tooth side surface positioning said inner and outer surfaces of said biting section between the biting surfaces of teeth and said inner surface of said vertical section positioned along an outer surface of a tooth.

5,586,563

METHOD FOR MAKING A SURGICAL DRAPE

Charles L. Newman, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1995, Ser. No. 546,587
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—849 **23 Claims**



1. A method for making a series of surgical drapes comprising the steps of:

advancing a first continuous web forming a body portion of a surgical drape along a first longitudinal axis to a cutting and bonding location, the first continuous web having a first width

perpendicular to the first longitudinal axis and first and second long edges generally parallel to the first longitudinal axis;

locating a second web having first and second long edges generally parallel to a second longitudinal axis so that the first long edge of the second web is adjacent to the cutting and bonding location and the second longitudinal axis is generally perpendicular to the first longitudinal axis;

forming a curvilinear seam between the first and second webs along a path extending into the second web, the path generally originating and terminating proximate the intersections of the first long edge of the second web and the first and second long edges of the first continuous web, respectively; and

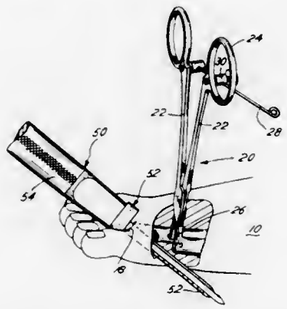
cutting the first continuous web and second web generally along the path so that a first portion of the second web forms a fitted portion on the body portion of a first surgical drape and a second portion of the second web forms a screen portion attached to the body portion of a second surgical drape in the series of surgical drapes.

5,586,564

INSTRUMENTATION AND SURGICAL PROCEDURE FOR DECOMPRESSION FOR MORTON'S NEUROMA

Stephen L. Barrett, and Michael G. Brown, both of The Woodlands, Tex., assignors to Instratek, Inc., Houston, Tex.

Filed Feb. 4, 1994, Ser. No. 192,167
Int. Cl.[6] A61B *19/00;17/32*
U.S. Cl. 128—898 **28 Claims**



28. A surgical method for decompression for Morton's neuroma, comprising the steps of:

preparing the patient for surgery;

making a first incision in the patient's foot;

making a second incision in the foot;

dissecting between the metatarsal heads;

palpating the intermetatarsal ligament;

palpating the plantar aspect of the patient's arch;

inserting a cannula and trocar into the foot through the second incision;

making a third incision in the foot;

projecting the cannula and trocar through the third incision;

removing any adipose tissue which is in the cannula;

inserting an endoscope into the cannula;

inserting a cutting instrument into the cannula; and

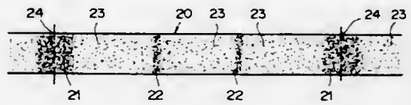
manipulating the cutting instrument to sever the intermetatarsal ligament.

5,586,565

METHOD FOR VARYING TOBACCO ROD DENSITY AND TOBACCO RODS WITH VARYING DENSITY PRODUCED THEREBY

Jacques Babey, Pully; Brian Salmon, St-Legier; Eric De Borst, Belmont, and Bernard Tallier, Cortaillod, all of Switzerland, assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 259,718, Jun. 14, 1994, Pat. No. 5,501,233. This application Dec. 19, 1995, Ser. No. 575,108
Claims priority, application European Pat. Off., Jun. 16, 1993, 93810432
Int. Cl.[6] A24C *5/14*
U.S. Cl. 131—84.2 **50 Claims**



1. A method of varying the density of a rod of tobacco material comprising the steps of:

providing a rod of tobacco material;

compressing a first end region of a segment of the rod to increase the density;

compressing a first intermediate region of the rod segment spaced apart from the first end region; and

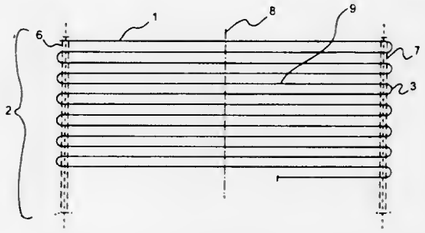
compressing a second end region of the rod segment, spaced apart from the first intermediate region the intermediate region located between the first and second end regions, the first and second end regions defining a segment length for a subsequently formed cigarette rod cutting the rod at the first end region and second end region to form the cigarette rod.

5,586,566

ZIG-ZAG METHOD OF BRAIDING HAIR

Ryeu K. Kim, 21100 Nashville St., Chatsworth, Calif. 91311, and Im S. Lee, #371-4 Geolpo-Ri, Kimpo-Up, Kimpo-Gon, Kyunggi-Do, Rep. of Korea

Filed Jul. 28, 1995, Ser. No. 508,706
Int. Cl.[6] A45D *24/00*
U.S. Cl. 132—200 **1 Claim**



1. A zig-zag method of braiding hair comprising a long braided lock of hair, folding said long braided lock of hair a plurality of times, wherein a resulting plurality of folds are equidistantly arranged forming a plurality of segments of said long braided lock of hair between each consecutive pair of said folds, said plurality of segments of said long braided lock of hair being parallel to one another, equidistantly arranged, and equal in length to one another, affixing a base transversely across said plurality of folds in which said folds are firmly attached to said base, and transversely cutting said plurality of segments through middle of said plurality of segments, thus resulting in two identical hair pieces.

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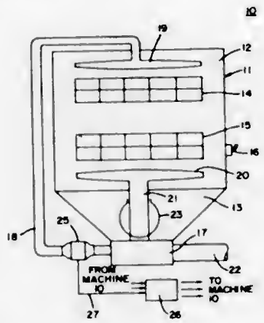
5,586,567
DISHWASHER WITH TURBIDITY SENSING MECHANISM

John M. Smith; David A. Schneider, both of Louisville, Ky.; Mark E. Dausch, Latham, and Walter Whipple, III, Amsterdam, both of N.Y., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 10, 1995, Ser. No. 370,795
Int. Cl.[6] A47L *15/46*
U.S. Cl. 134—57 D **10 Claims**



1. A dishwasher comprising:

a wash chamber for receiving fluid and articles to be washed in the fluid;

a spray mechanism for spraying fluid into said chamber to remove soil from articles therein;

a pump connected to said chamber, a conduit connecting said pump to said spray mechanism; said pump being selectively operable to withdraw fluid from said chamber and to supply the fluid to said spray mechanism through said conduit;

a turbidity sensing mechanism including a transparent tube in fluid flow relationship with said conduit between said pump and said spray mechanism; a source of electromagnetic radiation directed into the fluid in said tube; a sensor detecting electromagnetic radiation propagated through the fluid in said tube and providing a frequency signal representative of the turbidity of the fluid in said tube;

said turbidity sensing mechanism includes an elongated housing connected in said conduit, said transparent tube being mounted within said housing in fluid flow relationship with said conduit;

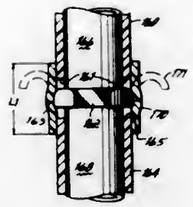
said housing defining a cavity therein around said tube;

said source of electromagnetic radiation being mounted in said cavity adjacent said tube and said sensor being mounted in said cavity adjacent said tube substantially opposite said source.

5,586,568
COVER ASSEMBLY AND METHOD FOR COVERING UNDERSINK PIPING

John A. Helmsderfer, 1033 Windsor Ct., Cincinnati, Ohio 45206

Continuation-in-part of Ser. No. 146,999, Oct. 29, 1993, Pat. No. 5,341,830. This application Jul. 7, 1994, Ser. No. 271,439
Int. Cl.[6] F16L *7/00;9/22*
U.S. Cl. 137—15 **14 Claims**



1. An insulative cover for insulating a P-trap drain piping assembly located under a sink including multiple pipe sections joined at junctures, the pipe sections joined by fastening structures which have a larger outer diameter than an outer diameter of the respective pipe sections, the cover comprising:

a first piece to be placed over a pipe section and having a diameter dimension and an end; and

a second piece to be placed over a pipe section and having a diameter dimension and an end;

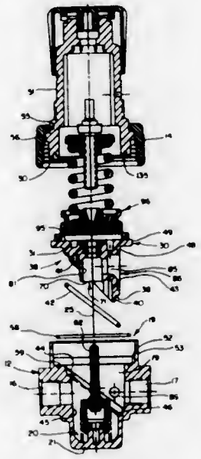
when placed over the respective pipe sections of said P-trap assembly, the end of the first piece being adjacent the end of the second piece at a pipe juncture;

a generally flexible collar structure configured to be slid along a portion of a pipe section and slid with respect to a portion of at least one of the first and second pieces, the collar structure being operably expansible for expanding its inner diameter and further being operable to be slid with respect to said piece away from the juncture so that the pipe sections may be joined together by the larger outer diameter fastening structure at said juncture, the expansible collar structure operable for expanding its inner diameter when the collar structure is subsequently slid over a portion of the juncture to cover said larger outer diameter fastening structure and form a generally continuous insulative cover over the joined pipe sections of the P-trap assembly.

5,586,569
PNEUMATIC PRESSURE REGULATOR

John R. Hanning, Wake Forest, and Daniel C. Olmsted, Youngsville, both of N.C., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jul. 27, 1995, Ser. No. 508,306
Int. Cl.[6] G05D *16/02*
U.S. Cl. 137—116.5 **21 Claims**



1. A fluid pressure regulator comprising

a housing including a main body having formed therein an inlet port, an outlet port and an intersecting chamber between the inlet and outlet ports, the intersecting chamber having a longitudinal axis,

a valve seat insert disposed in the intersecting chamber and having a insert body separating an upstream portion of the intersecting chamber from a downstream portion respectively in fluid communication with the inlet and outlet ports, the insert body having a valve seat surrounding a valve seat opening,

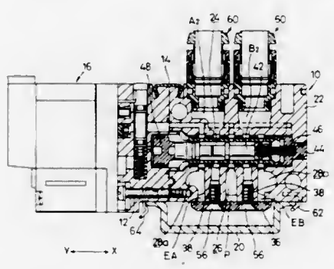
a valve element including a valve head movable into and out of engagement with the valve seat for opening and closing the valve seat opening to control flow from the inlet port to the outlet port,

the insert body having a peripheral edge in supportive engagement with a sealing surface on the main body, the peripheral edge and sealing surface being inclined to the longitudinal axis of the intersecting chamber and having a seal therebetween to provide fluid tight engagement of the insert body with the housing, and the insert body including a passage for directing the flow of fluid from the valve seat to the outlet port.

5,586,570
DIRECTIONAL CONTROL VALVE

Yoshihiro Fukano, and Yoshitada Doi, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP94/00640, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO95/28591, PCT Pub. Date Oct. 26, 1995
PCT Filed Apr. 18, 1994, Ser. No. 553,553
Int. Cl.[6] F15B *13/02;* **F16K** *27/00*
U.S. Cl. 137—271 **10 Claims**



1. A directional control valve comprising a supply port, an output port, a discharge port, a valve body having a valve hole communicating with the supply, output, and discharge ports, and a valve body displaceable in the valve body for controlling the direction of flow of a fluid under pressure, characterized in that:

said valve body has a supply passage and discharge passages extending therethrough in a direction in which directional control valves are arrayed, and first and second output ports communicating with said valve hole;

said supply port, said first output port, and said discharge port being defined in a first side surface of the valve body at positions for communication with corresponding openings in a manifold base for installing the directional control valve thereon, said supply port and said discharge ports being defined for communication with said supply passage and said discharge passage, respectively;

said second output port being defined in a second side surface of the valve body in opposite confronting relation to said first side surface thereof;

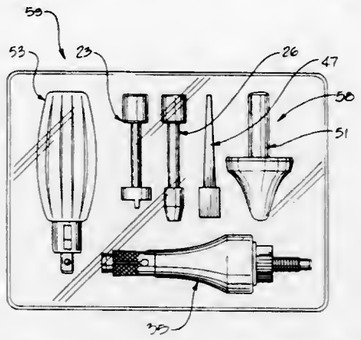
further comprising:

attachment means in said first side surface of the valve body for attaching a closure member for closing said supply port, said first output port, and said discharge port.

5,586,571
APPARATUS AND METHOD FOR REPLACING THE DIVERTER VALVE ASSEMBLY IN A FAUCET

Pedro M. Guillermo, 501 Mayo Rd., Glen Burnie, Md. 21061

Filed Sep. 15, 1994, Ser. No. 306,380
Int. Cl.[6] F16K *43/00*
U.S. Cl. 137—315 **4 Claims**

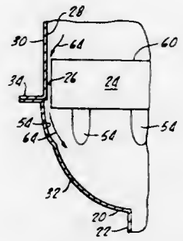


1. A kit containing a plurality of tools for removing different components of a diverter valve from a faucet comprising a container including a tang and flat shoulder tool capable of fitting in registry with the annular top and opposing slots of the diverter valve for removal of a portion thereof, a tapped end tool capable of receiving and holding a threaded tube upper end of the diverter valve, an expanding split sleeve tool for removing the top half portion of the diverter valve, an elongated wedge tool capable of removing a separated bottom end of the detached threaded tube of the diverter valve and an elastomeric wedge tool for use in removing the plastic broken bottom end portion of the diverter valve.

5,586,572
HYDROTHERMAL STABILIZER

William J. Lund, Stockton, Calif., assignor to ACT Distribution, Inc., Newport Beach, Calif.

Filed Mar. 30, 1994, Ser. No. 219,973
Int. Cl.[6] F16K *49/00*
U.S. Cl. 137—337 **10 Claims**



1. Plumbing apparatus for reducing energy consumption of a hot water heater, said plumbing apparatus comprising:

tank means for containing water, said tank means having a top with a water inlet therein and a bottom with a water outlet therein;

a buoyant piston, having an air volume therein, and said buoyant piston being movably disposed within said tank means and having a perimeter slidably engaging an inside wall of said tank means; and

means for enabling water entering the water inlet to pass by the buoyant piston when the buoyant piston is displaced to a selected lower position in said tank means by the entering

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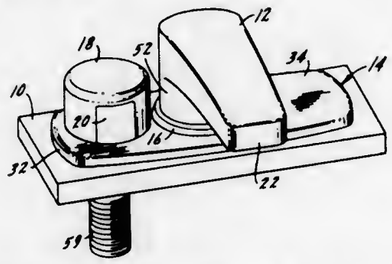
water, said buoyant piston having sufficient buoyancy to rise to the tank means top from the selected lower position when water is not entering the tank means water inlet.

5,586,573

FAUCET AND SENSOR MOUNTING

Richard A. Nortier, Westchester, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Sep. 11, 1995, Ser. No. 526,687
Int. Cl.[6] F16L *5/00*
U.S. Cl. 137—359 **9 Claims**



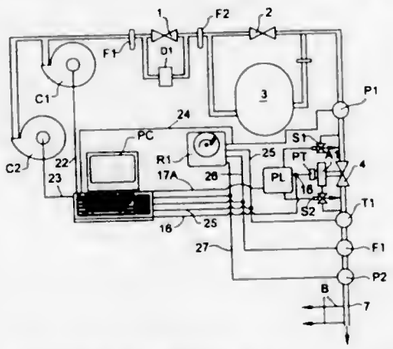
1. A faucet and sensor mounting including a faucet spout, an elastomeric filler ring having a central opening stretchable to pass over the faucet spout to provide for positioning the filler ring on a sink deck and about a previously installed faucet spout, a trim plate having a faucet spout opening of a size to pass over the faucet spout to provide for positioning the trim plate in place on a previously installed faucet spout, said trim plate faucet spout opening being of a size to cover a portion of said filler ring, with an interior portion of said filler ring extending closely about said faucet spout and outwardly through said trim plate faucet spout opening, a sensor opening in said trim plate spaced from said faucet spout opening, a sensor positioned in said sensor opening, an anti-rotation pin opening adjacent said sensor opening and an anti-rotation pin positioned in said opening and extending into said sensor to prevent rotation thereof.

5,586,574

AIR SYSTEM CONTROL

Dean E. Smith, 14911 Forest Oaks Dr., Louisville, Ky. 40245

Filed Mar. 3, 1994, Ser. No. 205,071
Int. Cl.[6] F16K *31/12*; **F04B** *49/08*
U.S. Cl. 137—487.5 **4 Claims**



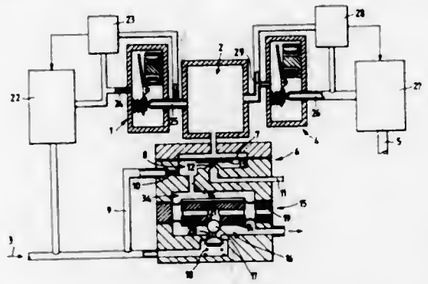
1. Control system for maintaining selected pressure in a gas distribution system including: a header means with multiple take-offs from the header; compressor means to supply gas to the header at selected pressure range: control valve in the header upstream of the first takeoff: actuator means to operate the valve to modulate flow to the header, pressure transducer means to measure the pressure of the gas in the header between the valve and the first takeoff, controller means to receive a signal from the pressure transducer and generate a controller signal corresponding to a valve position required to maintain the flow of gas to the header to maintain the selected pressure and a position control means to receive the controller signal and an electronic position feedback signal from the actuator to indicate the position of the valve; comparator means to compare the valve position signal with the controller signal; operator means to operate the actuator to move the valve in a direction to the position where the position feedback signal corresponds to the controller signal.

5,586,575

ELECTROPNEUMATIC CONVERTER WITH SOLENOID VALVE CONTROL

Giorgio Bergamini, and Venanzio Mininni, both of Bari, Italy, assignors to Nuovopignone- Industrie Meccaniche e Fonderia S.p.A., Florence, Italy

Filed Jun. 15, 1994, Ser. No. 260,918
Claims priority, application Italy, Jun. 22, 1993, MI93A1335
Int. Cl.[6] G05D *16/20*
U.S. Cl. 137—488 **5 Claims**



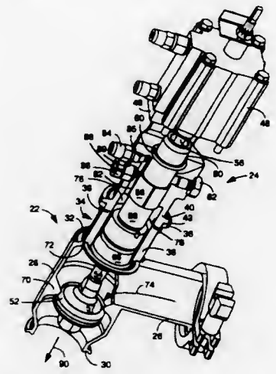
1. An electropneumatic converter with solenoid valve control, comprising a loading solenoid valve for loading and an unloading solenoid valve for unloading a capacitive chamber arranged in series with said solenoid valves and correspondingly connected by the loading solenoid valve to a feed pressure and by the unloading solenoid valve to atmosphere, said capacitive chamber being connected in series with a pressure repeater comprising a membrane separating said capacitive chamber from a repetitive pressure chamber which is connected to the feed pressure via a restriction and to atmosphere via a nozzle-plate system, the pressure of said repetitive pressure chamber being used to control a moving element of a booster unit modulating the output chamber pressure of an output chamber by means of a spring-loaded valving member connecting said output chamber pressure either to the feed pressure in the loading phase or to atmosphere in the unloading phase, characterized in that the loading solenoid valve is connected to the feed pressure via a first pressure regulator controlled by a first differential pressure measurement device connected across the loading solenoid valve such as to maintain the pressure difference across the loading solenoid valve constant and the unloading solenoid valve is connected to atmosphere via a second pressure regulator controlled by a second differential pressure measurement device connected across the unloading solenoid valve such as to maintain the pressure difference across the unloading solenoid valve constant.

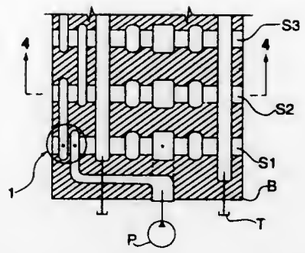
5,586,576

DOSING VALVE HAVING SEAL FAILURE DETECTION

Rickard Franke, Dalby, Sweden; Yutaka Kaneko, Wheeling, and Per Brandstrom, Lake Zurich, both of Ill., assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzeriand

Filed Sep. 28, 1994, Ser. No. 315,408
Int. Cl.[6] F16K *37/00*
U.S. Cl. 137—559 **4 Claims**





1. A dosing valve comprising:

a) an elongated cylindrical housing having an outlet at a first end and an inlet through a sidewall defining a path for product to pass through the housing, the housing further having a flange at a second end thereof;

b) a connection cylinder at the second end of the elongated housing, the connection cylinder having a first end adjacent the second end of the elongated housing, a second end, and a viewing opening disposed through a sidewall thereof;

c) a valve seat disposed between the outlet and the inlet;

d) a plug adapted to engage the valve seat thereby sealing the inlet from the outlet;

e) a rod attached to the plug and extending therefrom into the connection cylinder at the second end of the housing;

f) a rod drive attached at the second end of the housing for moving the rod between a first position in which the plug engages the valve seat and a second position in which the plug disengages the valve seat;

g) a flexible diaphragm mounted about the second end of the housing and sealing the connection cylinder from the path of product, the flexible diaphragm flexing with movement of the rod, the flexible diaphragm having a flange; and

h) a transparent sleeve dimensioned to fit within and seal with the connection cylinder, the transparent sleeve allowing direct visual observation of the flexible diaphragm through the viewing opening of the connection cylinder; and

g) means sealing the second end of the connection cylinder, the transparent sleeve having a first end securing the flange of the flexible diaphragm against the flange of the elongated housing and a second end adjacent the sealing means.

5,586,577

MONO-BLOCK CONTROL VALVE WITH SIDE BYPASS PASSAGE

Hyung J. Cho, Changwon, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 30, 1995, Ser. No. 497,628
Claims priority, application Rep. of Korea, Sep. 28, 1994, 94-24400; Sep. 29, 1994, 94-24709
Int. Cl.[6] E03B *1/00*
U.S. Cl. 137—596.13 **2 Claims**

1. A mono-block control valve having a plurality of sections corresponding to control valves in a body and applying the pressurized oil of a hydraulic pump to a plurality of actuators through the sections, comprising:

a parallel passage adapted for supplying the pressurized oil of the pump to the sections in parallel, said parallel passage being formed in the valve body such that the parallel passage passes the centers of all the sections;

right and left actuator ports formed in the valve body at opposite sides of the parallel passage such that the actuator pores selectively communicate with said parallel passage in accordance with spool movement;

right and left return passages formed in the valve body at the outside of said actuator ports respectively and adapted for returning the pressurized oil, coming out of said actuators, to a return tank;

a bypass passage formed in the valve body at the outside of either return passage such that the bypass passage passes all the sections, said bypass passage being selectively opened to return the pressurized oil of the pump to the return tank when a spool of each section is placed in its neutral position but shut down when the spool of each section moves; and

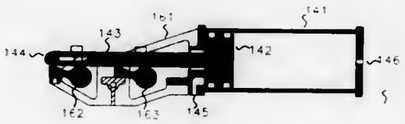
a connection passage connecting the right and left return passages together at every section.

5,586,578

POSITIVE SEQUENCE FLUID TRANSFER ASSEMBLY

John F. Trout, 1556 Kirkwood, Geneva, Ill. 60134

Filed Jun. 21, 1995, Ser. No. 493,098
Int. Cl.[6] E03B *1/00*
U.S. Cl. 137—596.18 **10 Claims**



1. A fluid transfer assembly comprising:

at least one transfer path assembly (**110**) comprising: an input port (**115**), an input valve (**151**), a transfer chamber (**155**), a transfer input-output port (**114**), an output valve (**152**), and an output port (**116**); and

control means (**140**) for adjusting said input and output valves characterized in that

said control means (**140**) comprises first and second lever assemblies (**162, 163**), coupled respectively to said input and output valves (**151, 152**), for respectively adjusting said input and output valves (**151, 152**), mechanical actuator means (**143, 144**) for positioning said lever assemblies (**162, 163**) in fixed transfer sequences such that said input and output ports (**115, 116**) are precluded from being in simultaneous communication with said transfer chamber (**155**), and means (**141, 142**) for controlling said mechanical actuator means.

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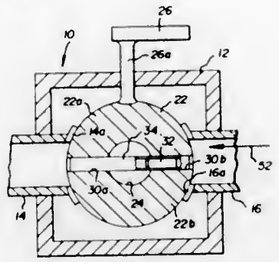
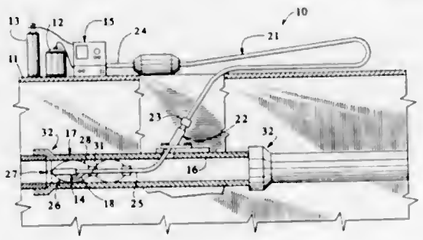
5,586,579
COMBINATION BALL VALVE AND PRESSURE RELIEF VALVE ASSEMBLY
Matthew D. Diehl, St. Albans, Vt., assignor to Martin Marietta Corporation, Bethesda, Md.
Filed Nov. 15, 1995, Ser. No. 559,752
Int. Cl.[6] F16K *15/18*
U.S. Cl. 137—614.17 **11 Claims**



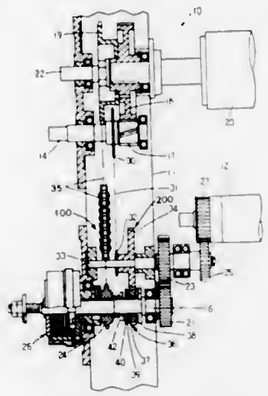
1. A valve assembly comprising, in combination:
first and second valve ports for connections into a fluid circuit;
a valve element movable between a closed valve position sealing at least one of the first and second valve ports and an open valve position accommodating fluid flow between the first and second valve ports; and
a relief valve incorporated in the valve element to permit pressure-relieving fluid flow between the first and second valve ports in response to excessive valve fluid pressure when the valve element is in the closed valve position.

5,586,580
APPARATUS AND METHOD FOR INTERNALLY SEALING PIPES
Allan T. Fisk, Needham, and David I. Freed, Waltham, both of Mass., assignors to Gas Research Institute, Chicago, Ill.
Filed Apr. 3, 1995, Ser. No. 415,267
Int. Cl.[6] F16L *55/162*
U.S. Cl. 138—98 **21 Claims**



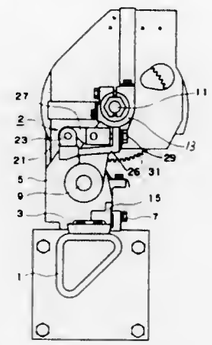
1. An apparatus for applying sealant to leaks and joints along an inside surface of a pipe, the pipe having an axis extending along the length thereof,
the apparatus comprising:
a push snake for insertion into a pipe and removal from the pipe through a single point of entry, the push snake including a distal end, a proximate end and a mid-section,
the distal end of the push snake including a head, the head including an applicator tip and a motor for rotating the applicator tip about the axis of the pipe,
the proximate end of the push snake being connected to a pressurized supply of sealant, the pressurized supply of sealant being disposed outside of the pipe, the push snake providing communication between the pressurized supply of sealant and the applicator tip,
the applicator tip includes at least one delivery tube in communication with the pressurized supply of sealant,
the applicator tip also including a flat disk which is rotated by a motor, the motor does not impart rotation to the delivery tube,
sealant is applied to the inside surface of the pipe when pressurized sealant is ejected from the delivery tube onto a front side of the disk during rotation of the disk,
the applicator tip further including a pair of flaps pivotally attached to the applicator tip and biased into a position parallel to the axis of the pipe and the snake when the applicator tip is not spinning, the flaps being forced radially outward into a position perpendicular to the axis of the pipe when the applicator tip is spinning.

5,586,581
CLOTH ROLL DRIVING APPARATUS FOR DRIVING THE CLOTH ROLL AT TWO DIFFERENT SPEEDS
Mitsuru Suwa, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Ishikawa, Japan
Filed Dec. 8, 1995, Ser. No. 569,519
Claims priority, application Japan, Dec. 22, 1994, 6-336247
Int. Cl.[6] D03D *49/20*
U.S. Cl. 139—304 **7 Claims**



1. A cloth roll driving apparatus for taking up a cloth around a cloth roll, which comprises:
a drive source adapted to be driven in synchronism with a main shaft of a weaving machine;
a slave shaft coupled to a cloth roll;
a drive shaft coupled to the drive source;
a first power transmission mechanism provided with a one-way clutch and adapted to transmit, through the one-way clutch, rotation of the drive shaft to the slave shaft as a torque in a direction in which the cloth is taken up and at a velocity corresponding to the weaving velocity of the cloth; and
a second power transmission mechanism provided with a clutch mechanism which is coupled to the slave shaft during the time of winding of the cloth around the cloth roll when the cloth roll is empty and adapted to transmit, through the clutch mechanism of the second power transmission mechanism, the rotation of the drive shaft as a torque in the same direction as the torque transmitted to the slave shaft by the first power transmission mechanism and at a velocity higher than said velocity corresponding to the weaving velocity of the cloth.

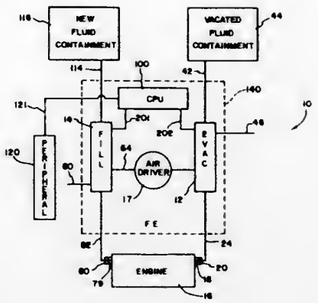
5,586,582
SUPPORT ASSEMBLY FOR A PLANETARY-TYPE SELVAGE UNIT ON A LOOM
Yasuo Nakada, Ishikawa-ken, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan
Filed Jun. 6, 1995, Ser. No. 469,661
Claims priority, application Japan, Sep. 27, 1994, 6-257443
Int. Cl.[6] D03D *47/40*
U.S. Cl. 139—430 **4 Claims**



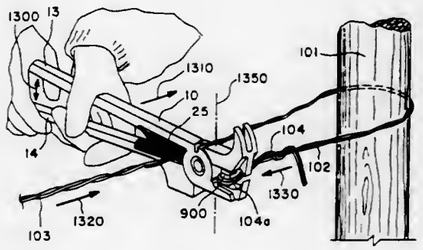
1. A support assembly for a planetary gear train type selvage unit on a loom comprising
a slide base adapted to be mounted atop a back top stay of said loom in an arrangement slidable in the width direction of said loom and adapted to rotatably carry a drive shaft for a drive gear of said planetary-type selvage unit,
a support bracket having a proximal end adapted to be swingably mounted to said drive shaft and having a distal end adapted to support said planetary-type selvage unit, and
a locker unit including a first element mounted to said slide base, a second element mounted to said support bracket and a third element for detachably engaging said first element with said second element,
whereby said support bracket is adapted to be swingable on said drive shaft between an operative position suited for a weaving operation and a stand-by position suited for a looming operation.

5,586,583
FLUID EXCHANGER WITH FLUID RECONCILIATION
Robert W. Edwards, Ootewah; Terry M. Fulmer, Chattanooga, and Patrick J. Schultz, Hixson, all of Tenn., assignors to Tokheim Corporation, Fort Wayne, Ind.
Continuation of Ser. No. 114,377, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 823,850, Jan. 22, 1992, Pat. No. 5,273,085. This application Sep. 19, 1994, Ser. No. 308,395
Int. Cl.[6] B65B *1/30;3/26*
U.S. Cl. 141—83 **8 Claims**

1. A computerized fluid exchange and reconciliation apparatus for engines, said apparatus comprising:
input means for displaying an operator query and providing an input signal based on an operator response;
computer means for receiving and processing said input signal, said computer means generating an output signal based on said input signal and a predetermined program; and
operating means responsive to said output signal to convey a measured volume of liquid from and to an engine.



5,586,584
FENCING TOOL AND METHOD OF OPERATION
Pol N. Haldemann, P.O. Box 879, Chinook, Mont. 59523
Continuation-in-part of Ser. No. 122, Jan. 2, 1987, Pat. No. 5,303,748. This application Mar. 11, 1994, Ser. No. 212,341
Int. Cl.[6] B21F *9/02*
U.S. Cl. 140—123.5 **3 Claims**



1. A method of securing fencing wire to a post, said method comprising the steps of:
a) providing a fencing tool having a first elongate portion with a working end and a handle end and a second elongate portion with a working end and a handle end joined at a pivot to said first elongate portion between the working end and the handle end of both the first and the second elongate portions wherein said second elongate portion is provided with a fulcrum bar located between said working end and said pivot and wherein said handle end of said first elongate portion and said handle end of said second elongate portion are both provided with wire-gripping surfaces to grip the fencing wire between said surfaces;
b) forming a loop in a free end of the fencing wire;
c) providing a bight in the fencing wire;
d) running the free end of the fencing wire containing the formed loop about the post and back upon a portion of the fencing wire so as to be in a substantially parallel spaced relationship with the bight;
e) inserting said loop in the free end of the fencing wire over said fulcrum bar;
f) engaging the bight of the fencing wire with said wire-gripping surfaces to form a pivot point between the loop and the bight;
g) applying force directed towards the post to said first and said second handle ends to stretch the fencing wire;
h) twisting the free end of the fencing wire around said portion by rotating said fencing tool about the bight so as to secure the stretched fencing wire to the post; and
i) removing the loop from over the fulcrum bar.

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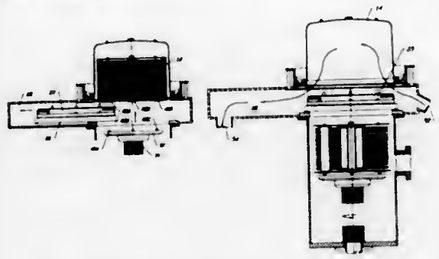
5,586,585

DIRECT LOADLOCK INTERFACE

Anthony C. Bonora, Menlo Park, and Joshua T. Oen, Newark, both of Calif., assignors to Asyst Technologies, Inc., Fremont, Calif.

Filed Feb. 27, 1995, Ser. No. 394,698
Int. Cl.[6] B65G *65/00*
U.S. Cl. 141—93 **41 Claims**



1. A loadlock chamber for transferring at least one semiconductor wafer supported within a support structure from a pod into a wafer fabrication process chamber without exposing the at least one semiconductor wafer or support structure to an atmosphere exterior to the pod and loadlock chamber, the pod including a pod door and a pod cover mating with the pod door, the loadlock chamber comprising:

means for receiving the pod;

means for separating the support structure from the pod door and pod cover prior to loading the support structure into an interior of the loadlock chamber without exposing the support structure or at least one semiconductor wafer to the atmosphere exterior to the pod and loadlock chamber; and

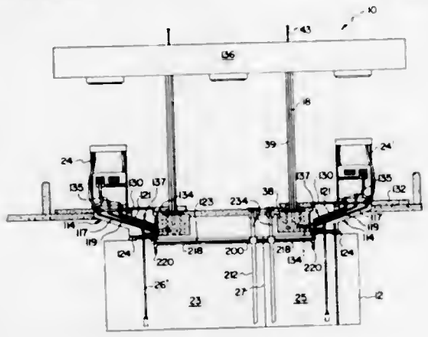
means for loading the support structure into said interior of the loadlock chamber without exposing the support structure or at least one semiconductor wafer to the atmosphere exterior to the pod and loadlock chamber, said interior including means for allowing transfer of the at least one semiconductor wafer from said interior to the wafer fabrication process chamber.

5,586,586

UNITIZED FUEL STORAGE SYSTEM

Manfred M. Flech, c/o Euro Tank, P.O. Box 478, Silver Springs, Fla. 33489-0478

Continuation-in-part of Ser. No. 988,836, Dec. 10, 1992, Pat. No. 5,390,713. This application Feb. 2, 1995, Ser. No. 383,505
Int. Cl.[6] B67D *5/60*
U.S. Cl. 141—98 **15 Claims**



1. A unitized tank structure comprising:

a vessel having at least first and second compartments;

fill lines coupled to the vessel providing access to fill said first and second compartments of said vessel with fuel;

at least one sump riser portion coupled to the vessel and extending therefrom;

at least first and second dispensing lines for dispensing fuel from the vessel, said dispensing lines being disposed within the sump riser portion and penetrating the vessel, each dispensing line extending within said vessel and within an associated one of said first and second compartments, said sump riser portion being constructed and arranged to contain fuel which may leak from said dispensing lines; and

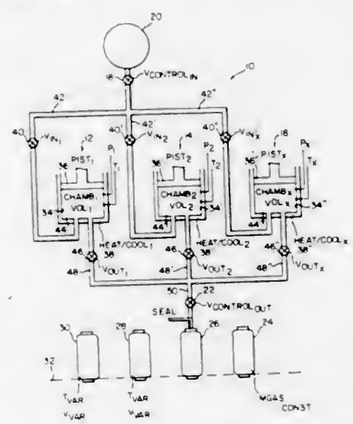
cross-over venting structure disposed within said vessel constructed and arranged to balance pressure in said first and second compartments when dispensing fuel from a compartment.

5,586,587

HIGH RATE PRESSURE VESSEL FILLING PROCESS

Daniel R. Leininger, Layton, and Walter A. Moore, Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jun. 14, 1995, Ser. No. 490,186
Int. Cl.[6] B65B *31/00*
U.S. Cl. 141—196 **14 Claims**



1. A method of filling a pressure vessel with a required gas mass comprising,

(a) flowing gas from a source thereof into a chamber having a set volume V,

(b) measuring the temperature of the gas in the chamber,

(c) controlling the temperature of the gas in he chamber,

(d) measuring the pressure of the gas in the chamber,

(e) utilizing the relationship

$$P = \frac{mRT}{MWV},$$

where P is the pressure of the gas in the chamber, m is the target gas mass, MW is the molecular weight of the gas, V is the volume of the chamber, R is the universal gas constant, and T is the temperature of the gas in the chamber,

correlating the measured pressure P through a feedback system to controlling the temperature of the gas in the chamber, the temperature measurement T, and the set volume V of the chamber to establish a gas mass in the chamber by the flow of gas thereinto, and

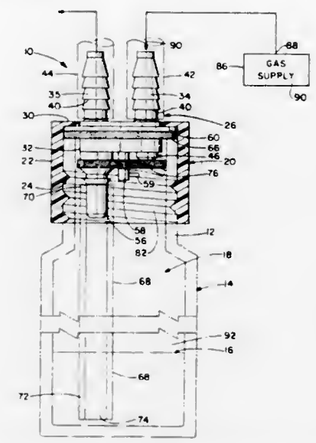
(f) once the required gas mass is accurately established in the chamber, rapidly discharging the gas mass from the chamber into the pressure vessel and immediately sealing the pressure vessel.

5,586,588

APPARATUS AND METHOD FOR PRESSURIZING AND DRAFTING LIQUID CONTAINED WITHIN FOOD-GRADE CONTAINERS

Lee B. Knox, 310 Adams Ave., Endicott, N.Y. 13760

Filed Dec. 21, 1994, Ser. No. 361,204
Int. Cl.[6] B65B *1/04;3/04;* **B67C** *3/00*
U.S. Cl. 141—285 **21 Claims**



1. An apparatus for use in pressurizing a liquid contained within an interior portion of a container and drafting the liquid from the container which includes a neck portion having external threads, said apparatus comprising:

a cap having a generally cylindrical body section and internal threads formed on said body section which are adapted to threadingly engage the external threads of the neck portion of the container and an annular flange attached to and protruding radially from said body section toward a central opening;

a fluid fitting assembly extending through said central opening in said cap and adapted to be secured to the neck portion by said cap, said fluid fitting assembly including a body section and a nipple assembly having an annular flange attached to and circumventing said body section of said nipple assembly, said annular flange of said nipple assembly being disposed inward of and in radially overlapping relationship with said annular flange of said cap, said nipple assembly including a first nipple for accepting a fluid from an external source for injection into the container and a second nipple for dispensing fluid from the container;

a draw tube having a first end attached to said second nipple, a second end immersed in the liquid, and an interior flow passage extending longitudinally between said first and second ends;

wherein said first nipple and said second nipple each include an outer portion attached to and protruding from an outer surface of said body section and adapted to be disposed externally of the container, an inner portion attached to and protruding from an inner surface of said body section within the interior portion of the container and an interior flow passage extending longitudinally through said inner and outer portions of the corresponding one of said first nipple and said second nipple, said interior flow passage of said first nipple is in fluid communication with the external source of the fluid and with the interior portion of the container and said interior flow passage of said second nipple is in fluid flow communication with said interior flow passage of said draw tube such that said draw tube and said second nipple combine to permit at least a portion of the liquid to be dispensed from the container through said exterior portion of said second nipple, said inner portion of said first nipple is disposed above the liquid within the container;

an annular seal surrounding said body section of said nipple assembly and disposed inward of said annular flange of said nipple assembly, said annular flange of said cap urges said annular seal into sealing engagement with said annular flange of said nipple assembly and the neck portion of the container when said cap is screwed onto the neck portion;

a check valve having first and second spaced apart holes extending therethrough disposed within the neck portion of the container and attached to said nipple assembly, said check valve having a generally circular shape and being fabricated from a resilient material which is substantially impermeable to the flow of fluid therethrough, said check valve flexes way from said inner portion of said first nipple so as to permit fluid to flow through said interior flow passage of said first nipple into the interior portion of the container when the pressure within said interior flow passage of said first nipple exceeds the pressure within the container by a predetermined differential pressure and said check valve is urged against said inner portion of said first nipple so as to close said interior flow passage of said first nipple thereby preventing fluid to flow outward through said first nipple when the pressure within the container exceeds the pressure within said interior flow passage of said first nipple;

a center post protruding from an inner surface of said body section of said nipple assembly and extending through one of said first and second holes and said inner portion of said second nipple extends through the other of said first and second holes; and

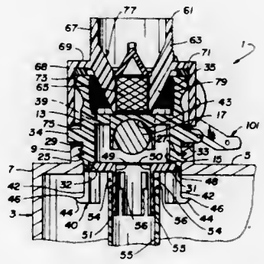
means for retaining said check valve.

5,586,589

REFILLABLE CLOSED CONTAINER SYSTEM

Scott C. Voelker, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1995, Ser. No. 445,362
Int. Cl.[6] B65B *1/04;3/00*
U.S. Cl. 141—349 **31 Claims**



1. A refillable closed container system comprising

a closed container having an upper wall and an opening in the upper wall through which the container can be filled and emptied,

a valve body in the container opening having a flow passage therethrough for permitting flow into and out of the container,

a magnetically attractable valve member in the valve body movable between a closed position for blocking flow through the passage and an open position for permitting flow through the passage, said valve member being gravity biased toward its closed position when the container is upright to inhibit unauthorized filling of the container through said passage and being movable toward an open position to permit emptying of the container through said passage,

a magnet carrier securable with respect to the container in a position adjacent the valve body,

a magnet carried by said magnet carrier for magnetically moving the valve member toward an open position when the magnet carrier is secured with respect to the container and the con-

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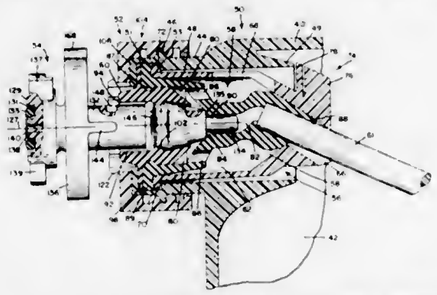
tainer is upright thereby to permit refilling of the container when the container is upright.

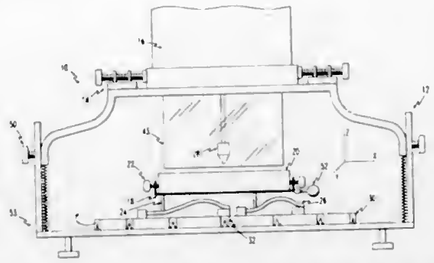
5,586,590
COUPLER FOR FLUID DELIVERY SYSTEM
Ronald J. Venooker, Franklin; John A. Scavitto, Mendon; Peter N. Karkantis, Acton; David T. Healey, No. Reading, and Richard L. Travers, Scituate, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.
Division of Ser. No. 165,137, Dec. 9, 1993, abandoned. This application Aug. 11, 1995, Ser. No. 513,697
Int. Cl.[6] B65D *47/00*
U.S. Cl. 141—386 **6 Claims**



1. A coupler for an aspirating fluid delivery system for conveying liquid from a source of liquid to be aspirated to a manifold fitting on an analytical instrument, said coupler comprising:
(a) a main body portion which has a central longitudinal axis, an elongated outer surface which is substantially parallel to said longitudinal axis, and an elongated liquid passageway which is substantially parallel to said longitudinal axis;
(b) a first end portion at one end of said main body portion which has a first end opening to said liquid passageway for operatively connecting said liquid passageway to said source of liquid; and
(c) a second end portion at the opposite end of said main body portion from said one end, said second end portion having a connector fitting which is complementary with said manifold fitting, said connector fitting have a second end opening to said liquid passageway for connecting said liquid passageway to said manifold fitting, said connector fitting having a first tab which extends transversely away from said longitudinal axis and a second tab which extends transversely away from said longitudinal axis, one of said tabs having a stop flange at a first widthwise side of said one tab which extends toward said first end portion, said one tab having a bevelled cam surface at a second widthwise side of said one tab, said bevelled cam surface facing away from said stop flange and said first end portion.

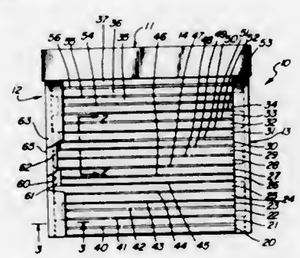
5,586,591
ROUTER ACCESSORY FOR PRODUCING CUTS HAVING A CONTOURED DEPTH
George G. Gaydos, 509 Peebles Apt #3, Pittsburgh, Pa. 15221
Filed Nov. 15, 1994, Ser. No. 339,798
Int. Cl.[6] B27C *5/10;* **B27M** *3/00*
U.S. Cl. 144—145.2 **9 Claims**

1. A router accessory comprising:
a housing having a router attaching portion;
a plate for fixedly holding a work piece, said plate having a plurality of arms extending therefrom; and
a plurality of track mechanisms attached to said housing, said arms slidably attached to the track mechanism so that the plate can be guided in a desired path relative to the router,



said track mechanisms having varying height for actively varying the spacing between the router attached to the housing and the plate as the plate is slidably guided by the track mechanisms.

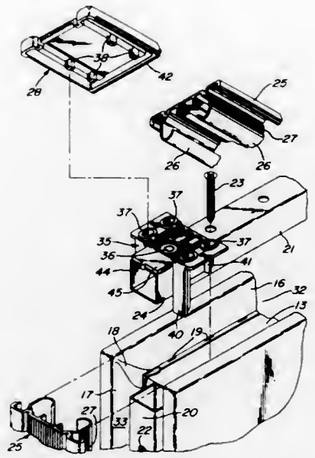
5,586,592
ROLLING SHUTTER AND SHUTTER DRIVE
Thomas McGregor, 1621 S. Ivanhoe St., Anaheim, Calif. 92804
Filed Apr. 25, 1995, Ser. No. 428,900
Int. Cl.[6] E06B *9/08*
U.S. Cl. 160—133 **19 Claims**



1. A rolling shutter covering an area comprising:
a shutter element array having a plurality of elongated shutter elements and a plurality of elongated links intercoupling said shutter elements;
a take-up roll coupled to said shutter element array for rolling said shutter element array;
a shutter drive operatively coupled to said shutter element array for moving said shutter element array to and from said take-up roller; and
shutter guide means for guiding said shutter element array into a position overlying said area,
said elongated links including at least one set formed of an apex link coupled to a pair of said shutter elements and a pair of angle links coupled to each of said shutter elements in said pair such that said pair of shutter elements form an included angle therebetween less than one hundred eighty degrees when said shutter element array is compressively loaded.

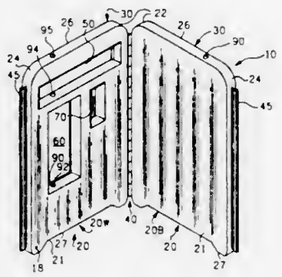
5,586,593
PARTITIONING SYSTEM
David L. Schwartz, Florence, Ala., assignor to Hunt Holdings, Inc., Wilmington, Del.
Filed Jun. 30, 1995, Ser. No. 497,558
Int. Cl.[6] A47G *5/00*
U.S. Cl. 160—135 **12 Claims**

1. A partition construction comprising a core having a rectangular frame with panels of relatively rigid sheet material overlying each side of said frame and extending beyond the top and side edges of the frame to form U-shaped channels along said top and



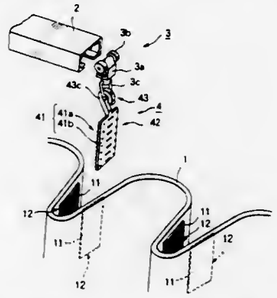
side edges, a top tube centrally disposed within said top edge U-shaped channel and attached to said frame, side tubes centrally disposed within said side edge U-shaped channels and attached to said frame, said top tube extending over the upper ends of said side tubes, side edge members for covering the side edge U-shaped channels, a top edge member for covering the top edge U-shaped channel except for an end portion thereof, a demountable top cap for covering the top U-shaped channel end portion not covered by said top edge member, a receiver mounted over said end portion to be covered and secured on an end of said top tube for demountably receiving said top cap, said receiver including a plurality of ribbed side edge slots which are elongated in direction parallel to said top edge, said top cap including a plurality of prongs aligned with said receiver slots, said prongs being shorter than the depth of the slots, said ribbed slot side edges holding said top cap prongs in a desired position, permitting both vertical and horizontal adjustment.

5,586,594
INFLATABLE WALL
Stanley N. Shapoff, 816 Coronado Ct., San Diego, Calif. 92109
Filed Nov. 17, 1995, Ser. No. 559,986
Int. Cl.[6] A47G *5/00*
U.S. Cl. 160—135 **15 Claims**



1. An inflatable wall comprising:
a wall panel including:
a pliable skin defining an inflatable enclosure; said skin including:
a first sheet generally defining a first side of said enclosure; said first sheet having an inner side and an outer side; and
a second sheet generally defining a second side of said enclosure; said second sheet having an inner side and an outer side;
internal web means within said enclosure joining said inner side of said first sheet to said inner side of said second sheet such that, when said enclosure is inflated, said first sheet and said second sheet are substantially parallel spaced vertical planes, said enclosure has a periphery and said wall panel has a periphery including a bottom for placement on a support surface, a top and first and second ends; and
hinge means attached to said wall first end; said hinge means having a vertical axis; said hinge means for supporting said wall in an upright position by hinged attachment to an adjacent wall.

5,586,595
CURTAIN ATTACHMENT CONNECTOR
Toshiaki Takizawa, and Kazuo Iwai, both of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan
Filed Sep. 27, 1995, Ser. No. 534,827
Claims priority, application Japan, Sep. 30, 1994, 6-236370
Int. Cl.[6] A47H *1/00*
U.S. Cl. 160—330 **11 Claims**



1. A curtain attachment connector movable along a guide member, being disposed between said guide member and a curtain having a number of male or female engaging faces at predetermined intervals on and along the upper edge, and having engaging faces which engage with said engaging faces of said curtain, said curtain attachment connector comprising a plate-like fastener member having said engaging faces, and an attachment extending from one end of said fastener member and adapted to be mounted to said guide member,
wherein said engaging faces of said fastener member including first and second engaging faces composed of a multiplicity of hooks rising from front and back sides of said fastener member, and
wherein said first and second engaging faces having different engaging strengths from each other.

5,586,596
DIE CAST VENT BLOCK
Lewis G. Freeman, 1509 Pontiac Dr., Kokomo, Ind. 46902
Filed Sep. 26, 1994, Ser. No. 312,308
Int. Cl.[6] B22D *17/14;17/20*
U.S. Cl. 164—253 **18 Claims**

1. A vacuum valve device in combination with a die pair comprising:
a first and a second die having a cavity and defining a parting line;
an ejector die block adapted to be coupled with said first die and including a slot adapted for enabling flow of a molten material from said cavity;

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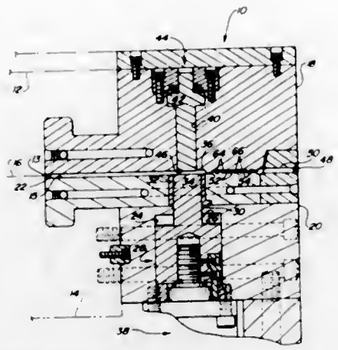


a shut-off piston disposed within said ejector die block;

a cover die block adapted to be coupled with said second die;

a complimentary surface for said shut-off piston disposed within said cover die block;

vent block means for preventing flow of said molten material, said vent block means including a first vent block having a plurality of lands and an alternating plurality of grooves, adjacent lands and grooves forming an overall oval shape when viewed in plan;

a second vent block having a plurality of lands and an alternating plurality of grooves, adjacent lands and grooves forming an overall oval shape when viewed in plan, a parting line defined by said first and second vent blocks, wherein said first and second blocks mate with one another to define a serpentine path, in cross-section, which path enables overflow of molten material to flow in and out of the parting line as well as to cool, solidify and stop; and

control means for controlling said shut-off piston.

5,586,597

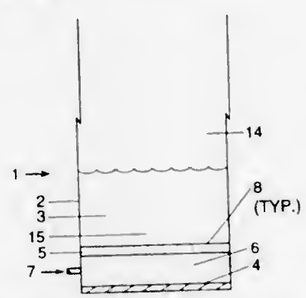
METHOD TO PREVENT/MITIGATE STEAM EXPLOSIONS IN CASTING PITS

Rusi P. Taleyarkhan, Knoxville, Tenn., assignor to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Filed Dec. 18, 1995, Ser. No. 573,813

Int. Cl.[6] B22D *11/124;11/22*

U.S. Cl. 164—487 **17 Claims**



1. A method of preventing and mitigating a steam explosion in a casting pit, comprising the steps of:

(a) providing a casting pit having a bottom and a cooling water reservoir;

(b) providing a floor system, having perforations, positioned in said cooling water reservoir in said casting pit; and

(c) introducing a compressed gas upward through said floor system into said cooling water reservoir during a casting operation.

5,586,598

HEAT EXCHANGER

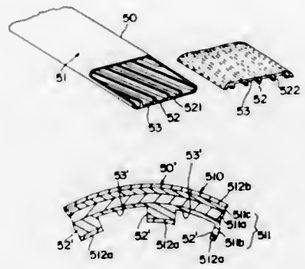
Hiroshi Tanaka, Isesaki, and Kazuki Hosoya, Sawa-gun, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 21, 1994, Ser. No. 361,301

Claims priority, application Japan, Dec. 21, 1993, 5-346144

Int. Cl.[6] F28F *1/40*

U.S. Cl. 165—133 **6 Claims**



1. A heat exchanger comprising:

pipe means for directing a first fluid to flow therethrough, said pipe means including at least one flat tube member across an exterior of which a second fluid flows laterally; and

dispersing means for dispersing the flow of the first fluid, as the first fluid flows through said pipe means, including a plurality of projected stripes fixedly disposed on an inner surface of said at least one flat tube member;

wherein each of said projected stripes has a first and a second side wall and an inner edge therebetween and said plurality of projected stripes are arranged to diagonally extend along said at least one flat tube member and said projected stripes include first portions which project from a lower inner surface of said at least one flat tube member and second portions which project from an upper inner surface of said at least one flat tube, such that said first and second portions of the projected stripes intersect with one another, and said first and second portions of said projected stripes are fixed with one another at said intersections therebetween;

wherein said flat tube member includes a clad construction, said clad construction comprising a base metal member and an inner brazing metal member fixedly connected to an inner peripheral surface of said base metal member only along said inner edge of said projected stripes.

5,586,599

HEAT EXCHANGER

Anders Sjöström, Lund, Sweden, assignor to Tetra Laval Holdings & Finance SA, Pully, Switzerland

Filed Oct. 17, 1994, Ser. No. 323,687

Claims priority, application Sweden, Oct. 21, 1993, 9303466; Jun. 10, 1994, 9402029

Int. Cl.[6] F28F *9/26*

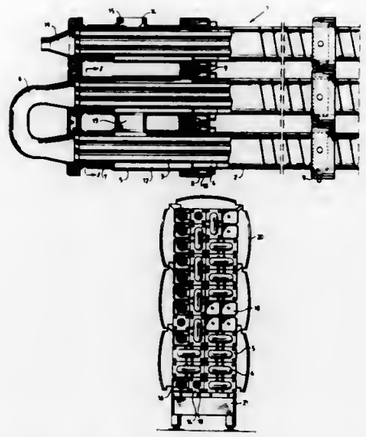
U.S. Cl. 165—143 **16 Claims**

1. A heat exchanger comprising:

a plurality of heat exchanger elements having at least one heat transfer tube for conveying a first fluid and a tubular jacket surrounding said at least one heat transfer tube for conveying a second fluid;

a plurality of modular units connected to the tubular jackets for supporting the heat exchanger elements;

at least one jacket connection element having two tubular elements connected by a connecting element, said connecting element conveying said second fluid from one of said two tubular elements to the other, said at least one jacket connection element being connected at a first end to two neighboring tubular jackets by two of said modular units;



at least one elbow pipe connecting the heat transfer tubes in two neighboring heat exchanger elements for conveying said first fluid; and

a coupling adapted to engage four mutually adjacent modular units.

5,586,600

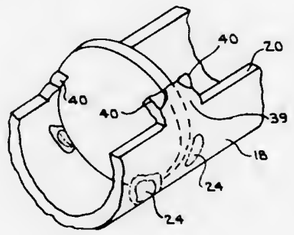
HEAT EXCHANGER

John C. Cribari, Oakland, Mich., assignor to Valeo Engine Cooling, Inc., Jamestown, N.Y.

Filed Oct. 26, 1994, Ser. No. 329,547

Int. Cl.[6] F28F *9/02*

U.S. Cl. 165—173 **10 Claims**



1. A tank part for connection to a header part to form a heat exchanger manifold, which tank part comprises an elongate generally channel-shaped member and at least one partition member fitted in the channel to extend transversely thereacross, wherein the tank part is provided with inwardly deformed regions on opposite sides of the at least one partition member in the longitudinal direction of the tank part to retain the at least one partition in position, wherein the inwardly deformed regions have inwardly protruding dimples formed in the wall of the tank part, and wherein two pairs of dimples are provided for the at least one partition.

9. A method of assembly of a tank part for a heat exchanger manifold of the type having separate tank and header parts joined to form a tubular manifold comprising the steps of:

a) providing a generally channel-shaped tank part and at least one partition member;

b) fitting the at least one partition member into the channel to extend transversely across the channel;

c) inwardly deforming the tank part on opposite sides of the at least one partition member to retain this in position; and

wherein in step c) a punch tool directed at the outside of the tank part is employed to form inwardly protruding dimples.

5,586,601

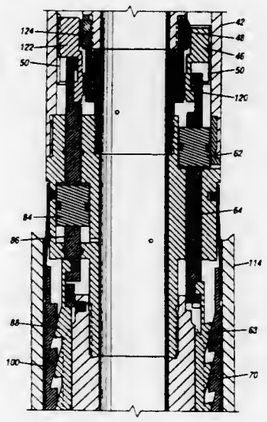
MECHANISM FOR ANCHORING WELL TOOL

Ronald E. Pringle, Houston, Tex., assignor to Camco International Inc., Houston, Tex.

Filed Apr. 28, 1995, Ser. No. 431,876

Int. Cl.[6] E21B *33/128;33/129*

U.S. Cl. 166—212 **14 Claims**



11. A mechanism for anchoring a well tool to a casing, comprising: a plurality of slip members carried on a well tool; a plurality of pistons each operatively connected to one of the slip members so that upon introduction of hydraulic fluid thereto each of the slip members is individually moved into engagement with an interior surface of the casing; and means to individually retract the slip members whereby axial rotational movement of a housing carried in the well tool causes each of the slip members pistons to retract.

5,586,602

METHOD AND APPARATUS FOR SHOCK WAVE STIMULATION OF AN OIL-BEARING FORMATION

Vladimir P. Vagin, Moscow, Russian Federation, assignor to Nefteotdacha, Ltd., Moscow, Russian Federation

Filed Nov. 9, 1995, Ser. No. 555,421

Claims priority, application Russian Federation, Apr. 11, 1995, 95104938

Int. Cl.[6] E21B *43/25*

U.S. Cl. 166—249 **14 Claims**

11. A method for imparting periodic elastic wave stimulation to the accumulation zone of an oil field having a plurality of producing wells, comprising the steps of selecting at least one well for wave generation; sealing the wave generation well so it is capable of functioning as a closed system; filling the well with a fluid; compressing an upper portion of the fluid in the well; suddenly releasing the compressed fluid into the remaining fluid, thereby creating a compression shock wave that travels to the well bottom; and repeating the steps of compressing and releasing the fluid.

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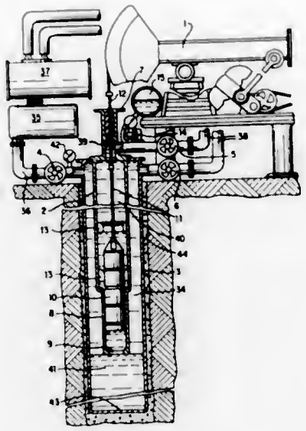


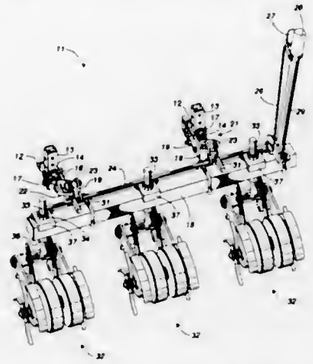
5,586,604
AERATOR

Leonard F. Postema, 830 Ranchwood Trail, Woodstock, Ga. 30188

Continuation-in-part of Ser. No. 508,322, Jul. 27, 1995, which is a continuation-in-part of Ser. No. 252,244, Jun. 2, 1994. This application Jan. 11, 1996, Ser. No. 584,980

Int. Cl.[6] A01B *45/02*

U.S. Cl. 172—21 — 22 Claims



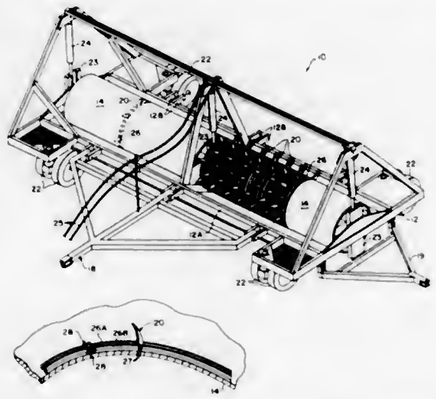
5,586,603
SPIKES FOR FIELD AERATOR

Henry J. Mattis, 601 Shoshone #15, Cheyenne, Wyo. 82009

Continuation-in-part of Ser. No. 217,972, Mar. 25, 1994, Pat. No. 5,460,229. This application Sep. 6, 1995, Ser. No. 524,245

Int. Cl.[6] A01B *45/02*

U.S. Cl. 172—21 — 6 Claims



1. In field aerator apparatus of the type having a rotatable drum member and a plurality of band members carried on the periphery of the drum; wherein the band members are adjustably movable axially along the drum; wherein the improvement comprises a plurality of elongated spike members each having a base end and a tapered free end, wherein the base end includes a plurality of attachment apertures therethrough and the base end is attached to said band members by means of said plurality of attachment apertures; wherein said tapered end defines an angle in the range of about 15° to 30°; wherein said spike member has a thickness in the range of about 0.3 to 1 inch; and wherein said spike member has a length of about 10 to 15 inches.

1. An aerator assembly for attachment to a deck of a lawn mower to aerate the soil of a lawn as the mower moves across the ground, said aerator assembly comprising:

a frame adapted to be mounted to the deck of the mower with said frame extending a predetermined distance rearwardly of the mower deck;

an elongated caster pin mounted to said frame for rotation about its longitudinal axis, said caster pin being oriented substantially vertically to extend from an upper end portion of said caster pin downwardly to a lower end portion of said caster pin;

a first pivot plate axle secured at one end to said lower end portion of said caster pin, said pivot plate axle extending substantially horizontally from said lower end of said caster pin to a free end of said pivot plate axle;

a pivot plate having a proximal end portion and a distal end portion, said pivot plate being substantially planar and being pivotally mounted at its proximal end portion to said free end of said first pivot plate axle for substantially vertical pivotal motion of said pivot plate between a lowered position relative to said first pivot plate axle and a raised position relative thereto;

a substantially circular weighted wheel having a predetermined weight and being mounted to said pivot plate adjacent its distal end for rotation of said weighted wheel about a substantially horizontal axis, said weighted wheel rolling on the ground when said aerator assembly is attached to the mower and said pivot plate is in said lowered position, said caster pin, pivot plate, and weighted wheel forming a caster assembly adapted to follow the mower as it moves across a lawn;

a spiked aerator wheel having a plurality of substantially radially projecting curved tines extending outwardly from a central hub, said aerator wheel rotatably mounted to said pivot plate at a location intermediate said proximal end portion of said pivot plate and the mounting location of said weighted wheel, said spiked aerator wheel being mounted for rotation about a substantially horizontal axis and being positioned on said pivot plate so that the weight of said weighted wheel causes said tines of said aerator wheel to be driven into the ground to aerate the soil as the mower to which said aerator assembly is attached moves across the lawn.

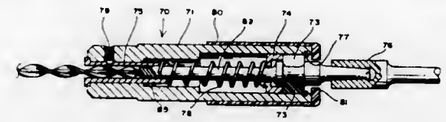
5,586,605
MULTI-WALL TIE APPARATUS

Robert I. Paterson, London, and Brian A. Breeze, Wallsend, both of England, assignors to Helifix Ltd., Bickinshamshire, United Kingdom

Continuation-in-part of Ser. No. 204,465, Feb. 28, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 491,358

Int. Cl.[6] B25C *5/13*

U.S. Cl. 173—4 — 7 Claims



4. An adapter for use with a hammer drill for reciprocatingly driving a helical tie between walled members, comprising, in combination:

a hollow hand grip of tubular cross-section, said grip having two ends and a hollow ;

a drive pin positioned interiorly of the hand grip;

said drive pin having a shaft;

said drive pin being slidable within the hollow of the hand grip;

an SDS engaging means;

said shaft having two ends, one end being rigidly secured to the SDS engaging means, and the other end terminating in a helical tie engaging means for receiving a portion of the helical tie therein;

a spring coaxially mounted along the shaft of the drive pin; and

a tubular guide shaped to fit within one end of the hand grip, said tubular guide being shaped to receive the helical tie, whereby the helical tie can be inserted into the tubular guide and seated within the helical tie engaging means of the shaft and, thereafter, reciprocatingly driven into the walled members.

5,586,606
SYSTEM FOR LUBRICATING AND RECIPROCATING A PISTON IN A FLUID-ACTIVATED, PERCUSSIVE PAVING BREAKER

Robert R. Kimberlin; Steven W. Bodell, both of Troutville; Ted C. Chang; Robert M. Diesel, both of Roanoke, and Scott Barker, Daleville, all of Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Division of Ser. No. 282,356, Jul. 29, 1994, Pat. No. 5,524,714. This application Oct. 17, 1995, Ser. No. 545,443

Int. Cl.[6] B25D *17/04*

U.S. Cl. 173—62 — 1 Claim

1. A system for simultaneously lubricating and reciprocating a piston within a bore of a housing of a fluid-activated paving breaker comprising:

(a) said housing having a rear housing portion, with said bore extending axially therethrough forming a rear housing bore;

(b) handles mounted on said rear housing portion adjacent said rear housing bore;

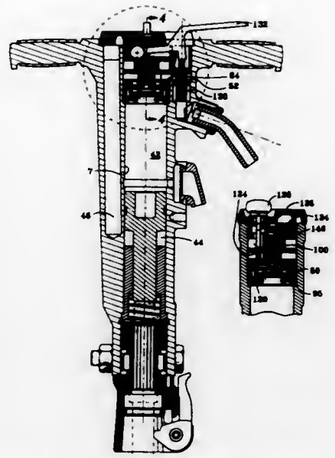
(c) an inlet port for transmitting high pressure fluid into said rear housing bore;

(d) valve assembly means removably mounted in said rear housing bore, for communicating high pressure fluid with a drive chamber and low pressure fluid with a return chamber in said housing bore, whereby said piston is reciprocated, said valve assembly means positioned axially within said rear housing bore with respect to said inlet port so that high pressure fluid contacts a top surface of said valve assembly means when said inlet port is opened;

(e) means for retaining said valve assembly means within said rear housing bore;

(f) means for injecting a lubrication fluid into said rear housing bore through said rear housing portion;

(g) means for opening and closing said inlet port; and



(h) said means for retaining said valve assembly means within said rear housing bore further comprising:

(a) a valve housing plug, substantially the same cross-sectional shape and size as said rear housing bore, removably inserted into said rear housing bore;

(b) means for axially spacing said housing plug from said top surface of said valve assembly means;

(c) a bottom surface of said housing plug, said top surface of said valve assembly means and said housing forming a high pressure fluid chamber between said valve assembly means and said housing plug;

(d) a top housing plate removably connected to said housing, said housing plate contacting a top surface of said housing plug to retain said housing plug in said rear housing bore; and

(e) means for fluid tight sealing of said housing plug in said rear housing bore.

5,586,607
MANUALLY OPERATED CHIPPING TOOL

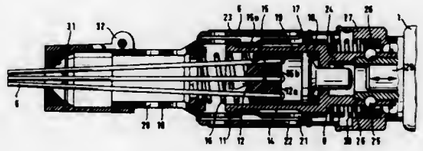
Anton Neumaier, Fürstenfeldbruck, and Hans-Christian Donner, Karlsfeld, both of Germany, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Apr. 25, 1995, Ser. No. 428,756

Claims priority, application Germany, Apr. 25, 1994, 44 14 342.7

Int. Cl.[6] B25D *17/00;* B23D *79/00*

U.S. Cl. 173—117 — 9 Claims



1. Manually operated tool for chipping material from a surface comprises a housing 1 extending axially between a leading end and a trailing end, a plurality of axially elongated needle-type chisels (8) each having a leading end and a trailing end with the leading ends projecting from the leading end of said housing, a needle cage (12) having a leading end and a trailing end located within said housing, and an anvil (17) having a leading end and a trailing end located within said housing adjacent the trailing end of said cage, said anvil being axially displaceable within said housing against

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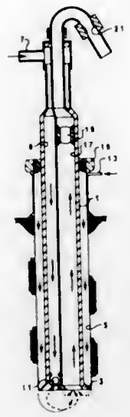
the counteracting force of a compression spring (16) having a leading end and a trailing end and abutting said housing at the leading end thereof, a hammer (29) located within said housing and arranged to strike the trailing end of said anvil (17) and advance said anvil in the axial direction, said hammer (29) being displaceable within said housing in the axial direction of said needle-type chisels (8), said needle cage (12) having a plurality of bores extending therethrough in the axial direction of said chisels, said needle cage being enclosed and guided within an axially extending guide sleeve (14) disposed between said anvil and said compression spring, said compression spring (15) forcing said guide sleeve against the leading end of said anvil, and said needle cage being freely axially displaceable within said guide sleeve between the leading end of said anvil and a stop shoulder (15*b*) formed at a leading end of said guide sleeve.



5,586,608

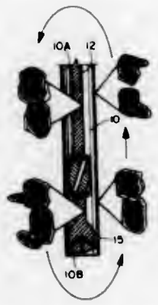
METHOD OF MAKING AN ANTI-BIT BALLING WELL FLUID USING A POLYOL HAVING A CLOUD POINT, AND METHOD OF DRILLING

David E. Clark, Humble, and William M. Dye, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 7, 1995, Ser. No. 473,614

Int. Cl.[6] C09K *7/02;* **E21B** *47/06;21/08*

U.S. Cl. 175—40 **20 Claims**



11. A method of lubricating drilling equipment during the drilling, completion or workover of a subterranean well, comprising the steps of:

(a) determining uphole region and downhole region operating temperatures in the well; and

(b) contacting the drilling equipment with a treating fluid by circulating the treating fluid between the uphole region and downhole region, with the treating fluid comprising an oil phase, a water phase, and a cloud point additive, wherein the cloud point additive has a cloud point temperature greater than the uphole operating temperature and equal to or less than the downhole operating temperature.

5,586,609

METHOD AND APPARATUS FOR DRILLING WITH HIGH-PRESSURE, REDUCED SOLID CONTENT LIQUID

Frank J. Schuh, Plano, Tex., assignor to Telejet Technologies, Inc., Dallas, Tex.

Filed Dec. 15, 1994, Ser. No. 356,656

Int. Cl.[6] E21B *17/18;21/12*

U.S. Cl. 175—65 **37 Claims**

1. A method of drilling a borehole comprising the steps of:

running a drillstring terminating in a drill bit into a borehole;

pumping a reduced solid content drilling fluid through the drillstring and out the bit, wherein the drilling fluid impinges upon and disintegrates formation material in cooperation with the bit;

continuously pumping an annulus fluid having a density greater than that of the drilling fluid into an annulus between the borehole and drillstring while drilling formation material, wherein the annulus fluid extends substantially from the earth's surface to the bit;

returning the drilling fluid and cuttings resulting from disintegration of formation material to the earth's surface through a substantially unobstructed tubular return passage in the drillstring; and

maintaining the annulus fluid under a selected pressure in the annulus, wherein an interface is formed at the drill bit at which annulus fluid mixes with the drilling fluid and is returned along with the drilling fluid and cuttings, but drilling fluid is substantially prevented from entering the annulus.

5,586,610

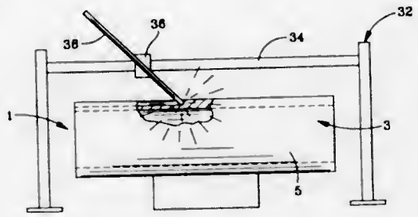
KELLY BAR HAVING HARDENED FLUTES

James N. Sajatovic, Nazareth, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 5, 1995, Ser. No. 463,466

Int. Cl.[6] E21B *3/04*

U.S. Cl. 175—195 **8 Claims**



1. A kelly bar comprising:

(a) a hollow, tubular, elongated body having an outer surface, said body terminating in a first end and a second end;

(b) an electric arc gouged flute in said outer surface, extending axially lengthwise along said body substantially the distance between said first and second end, said flute extending radially inwardly into said body and terminating at a curved bottom surface; and

(c) said body having a first microstructure at said flute bottom surface and a second microstructure away from said flute bottom surface, said first microstructure comprising a heat-affected zone having a hardness greater than a hardness of said second microstructure.

5,586,611

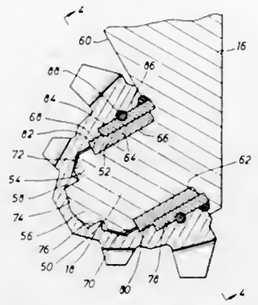
DRILL BIT HAVING DUAL SPLIT BUSHINGS FOR CUTTER SUPPORT AND RETENTION

Daniel E. D. Dorosz, Joplin, Mo., assignor to Cypress Services, Inc., Spring, Tex.

Filed Oct. 13, 1995, Ser. No. 542,678

Int. Cl.[6] E21B *10/22*

U.S. Cl. 175—369 **13 Claims**



1. A rotary cutter cone type drill bit, comprising:

(a) a body structure having a plurality of depending cutter support lugs;

(b) spindle means being integral with each of said cutter support lugs and defining a cylindrical bushing support surface;

(c) a cutter cone being positioned for rotation about each of said spindle means;

(c) an inner split bushing being received in immovable relation about said cylindrical bushing support surface; and

(d) an outer split bushing being received in rotatable bearing relation about at least a portion of said inner split bushing and retaining said inner split bushing about said cylindrical bushing support surface, said outer split bushing being disposed in immovable relation with said cutter cone.

5,586,612

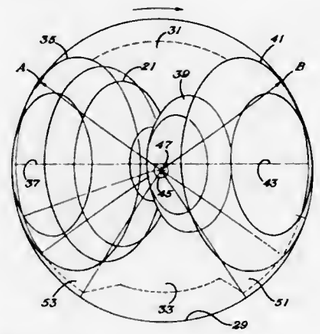
ROLLER CONE BIT WITH POSITIVE AND NEGATIVE OFFSET AND SMOOTH RUNNING CONFIGURATION

Matthew R. Isbell, and Rudolf C. O. Pessier, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 26, 1995, Ser. No. 378,345

Int. Cl.[6] E21B *10/08*

U.S. Cl. 175—353 **9 Claims**



1. An earth-boring bit comprising:

a bit body;

at least a pair of cantilevered bearing shafts depending downwardly and inwardly from the bit body;

a first cutter mounted for rotation on one of the bearing shafts, the first cutter having a region of contact with the sidewall of the borehole;

a second cutter mounted for rotation on another of the bearing shafts, the second cutter having a region of contact with the sidewall of the borehole that is non-opposite that of the first cutter;

a stabilizer pad carried on the bit body, the stabilizer pad being arranged opposite the contact regions of the first and second cutters.

5,586,613

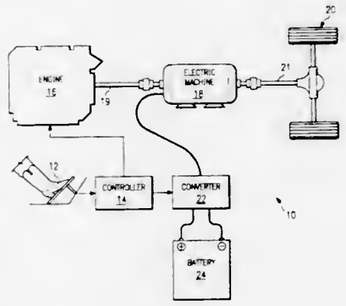
ELECTRICALLY PEAKING HYBRID SYSTEM AND METHOD

Mehrdad Ehsani, Bryan, Tex., assignor to The Texas A&M University System, College Station, Tex.

Continuation of Ser. No. 51,156, Apr. 22, 1993, abandoned. This application Sep. 26, 1994, Ser. No. 312,438

Int. Cl.[6] B60K *6/04*

U.S. Cl. 180—65.2 **8 Claims**



1. A hybrid electric-combustion vehicle drive system, comprising:

an engine operable to generate mechanical energy, said engine mechanically coupled to a drive mechanism;

a battery operable to store electrical energy and to deliver electrical energy;

an electric machine mechanically coupled to said engine and said drive mechanism, and electrically coupled to said battery, said electric machine operable to translate electrical energy from said battery into additional mechanical energy at said drive mechanism in a first mode of operation and to translate mechanical energy from said engine and said drive mechanism to electrical energy and to deliver the electrical energy to charge said battery in a second mode of operation; and

a controller coupled to said engine and said electric machine operable to monitor said engine and said electric machine over a period of time, said controller being further operable to adjust the power level of said engine such that for each of a plurality of different operating conditions said engine operates at a determined average required power level of the system when said battery is a partially charged condition and to operate said engine at a power level below the determined average required power level of the system when said battery is in a fully charged condition, the first mode of operation being entered when system power requirements exceed a selected operating power level of the engine and the second mode of operation being entered when system power requirements are less than a selected operating power level of the engine, said controller being further operable to control the delivery of electrical energy from said electrical machine to said battery.

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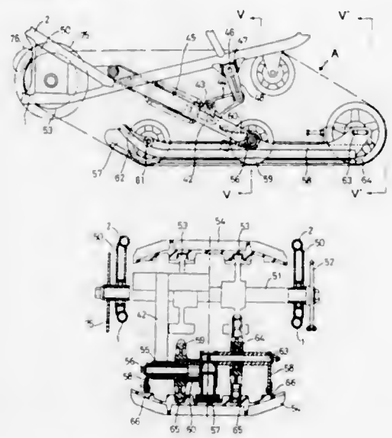
5,586,614
SNOW VEHICLE

Takao Kouchi, and Hideaki Suzuki, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,006
Claims priority, application Japan, Nov. 29, 1993, 5-298407; Sep. 22, 1994, 6-254241
Int. Cl.[6] B62D *55/06*
U.S. Cl. 180—190 **14 Claims**



1. A snow vehicle comprising:

a slide rail structure;

a plurality of pairs of guide wheels supported on the slide rail structure; and

a crawler belt supported and guided on a lower surface thereof by said guide wheels;

wherein the slide rail structure includes

a main slide rail supporting a longitudinal center portion of said crawler belt, and

a pair of side slide rails being disposed respectively along opposed longitudinal side portions of said crawler belt,

wherein said guide wheels are laterally disposed between said side slide rails,

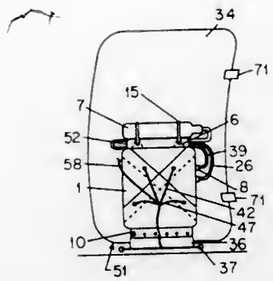
wherein a clearance is provided between said crawler belt and each side slide rail, and

wherein said crawler belt selectively engages at least one of said side slide rails when the corresponding clearance is closed between said crawler belt and the at least one side slide rail by deflection of said crawler belt.

5,586,615
VACUUM PACKAGED ESCAPE SLIDE

David R. Hammer, Glendale; Kenneth W. Sego, Jr., Peoria, and Lance C. Labun, Tempe, all of Ariz., assignors to Simula Inc., Phoenix, Ariz.

Filed Jun. 7, 1995, Ser. No. 477,402
Int. Cl.[6] A62B *1/20*
U.S. Cl. 182—48 **39 Claims**



1. An inflatable escape slide system comprising:

(a) a vacuum packaged envelope containing an inflatable escape slide, an aspirator and at least one slide light;

(b) means for fluidly connecting a carbon dioxide cylinder to the inflatable escape slide system;

(c) fluid connection means for connecting the means for connecting a carbon dioxide cylinder to the inflatable escape slide system to the aspirator through a vacuum envelope interface, said fluid connection means comprising a rapture disk at the vacuum envelope interface, said aspirator being fluidly connected to the inflatable escape slide;

(e) means for electrically connecting a battery pack through an electrical feedthrough in the vacuum envelope to the at least one slide light;

(f) a girt bar;

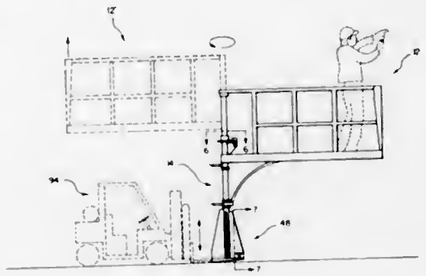
(g) at least one tear initiator cord, with each tear initiator cord being attached at one end to the vacuum envelope proximate to a tear initiator attachment point, and attached at the other end to the girt bar; and

(h) an outer girt attached at one end to the girt bar.

5,586,616
ROTATABLE SCAFFOLD

Nick Ksenych, 1900 14th Ave., NW., P.O. Box 1564, Watertown, S. Dak. 57201

Filed Nov. 8, 1994, Ser. No. 336,855
Int. Cl.[6] E04G *1/00*
U.S. Cl. 182—222 **11 Claims**



1. A scaffold adapted for use with a forklift truck, said truck including a pair of fines for lifting a load, said scaffold comprising:

(a) a work platform; and

(b) a vertical mast to which said work platform is mounted, said vertical mast including:

(i) means for mounting said mast to said fines of said forklift truck;

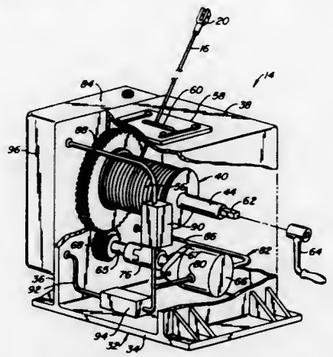
(ii) means for allowing a worker on said platform to rotate said platform about said mast to any desired position; and

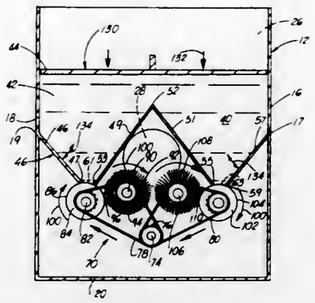
(iii) foothold means mounted to said mast and adapted to rotate with said platform so as to allow said worker to ascend and descend from said platform.

5,586,617
AUTOMATIC EMERGENCY ESCAPE FOR TALL STRUCTURES

Robert L. England, 1443 Tamara Ct., Benicia, Calif. 94510, and Donn E. Albert, Florissant, Mo., assignors to Robert L. England, Benicia, Calif.

Filed Sep. 30, 1994, Ser. No. 315,793
Int. Cl.[6] A62B *1/02*
U.S. Cl. 182—238 **1 Claim**





1. Apparatus for lowering persons during an emergency along an upright exterior of a structure to the ground surrounding the structure at a safe, predetermined speed, the apparatus comprising: a drum adapted to be attached to the structure and a cable wound about the drum and of sufficient length so that a free end of the cable can reach the ground, the drum being rotatable in a first direction for paying out the cable and lowering the free end thereof to the ground; a hydraulic circuit including a gear pump operatively coupled to the drum so that rotation of the drum causes the gear pump to operate and generate a flow of hydraulic fluid through the circuit; a flow control valve interposed in the hydraulic circuit limiting the rate of flow through the hydraulic circuit to therewith control and limit a rate of rotation of the drum so that the cable is lowered at said predetermined speed when a load is applied to its free end irrespective of a fluid pressure generated by the gear pump; a hand crank operatively coupled with the drum for manually rotating the drum in a second direction opposite the first direction to thereby rewind the cable about the drum and raise the free end of the cable from the ground; and means independent of the flow control valve for preventing the flow control valve from affecting the rate of rotation of the drum in the second direction; a housing enclosing the drum including an elongated slot parallel to an axis of the drum and extending over a length of the drum about which the cable is wound when the cable is fully retracted for guiding the cable as it is paid out and rewound; and a container for holding a quantity of the hydraulic fluid, fluidly coupled with the hydraulic circuit, and disposed outside the housing, the container being sized and shaped so that it holds a quantity of fluid and prevents the fluid in the container from rising above a temperature of about 250° F. even when a plurality of persons in succession use the apparatus for lowering themselves to the ground; whereby a person suspended from the free end of the cable descends along the exterior of the structure at the predetermined speed irrespective of the person's weight and without requiring independent control or external power.

5,586,618
SYSTEM FOR LUBRICATING THREADED MEMBERS

Dale Francis, 379 Fairfield Ave., Gretna, La. 70056

Filed Nov. 14, 1995, Ser. No. 557,501
Int. Cl.[6] F16N *19/00;7/19*
U.S. Cl. 184—14 **17 Claims**

14. An apparatus for lubricating threads of threaded members, comprising:

a) a chamber for housing lubricant;

b) a first roller for receiving lubricant from the chamber onto an outer surface of the roller;

c) a first brush member, making sufficient contact with the outer surface of the first roller to receive lubricant onto bristles of the brush member;

d) a second roller for receiving lubricant from the chamber onto an outer surface of the second roller;

e) a second brush member, making sufficient contact with the outer surface of the second roller to receive lubricant onto bristles of the second brush member;

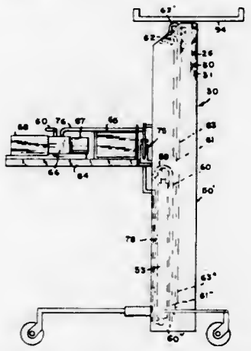
f) power-driven drive chains engaging and rotating the first and second rollers and the first and second brush members so that the lubricant can be transmitted from the outer surface of the first and second rollers to the bristles of the first and second brush members as the rollers and brushes are rotated;

g) a circular opening in the wall of the apparatus for allowing a threaded member to be positioned sufficiently adjacent the bristles of the first and second brush members for receiving lubricant from said bristles onto a portion of the outer threaded portion of the threaded member as the threaded member is manually rotated, and the rollers and brush members are rotated by the drive chains.

5,586,619
LIFTING APPARATUS

Roland O. Young, R.R. #1, Box 138, Grand Forks, N. Dak. 58201

Filed Nov. 25, 1994, Ser. No. 344,886
Int. Cl.[6] B66F *9/06;9/08*
U.S. Cl. 187—226 **11 Claims**



1. A lifting apparatus comprising a housing, at least three elongated telescoping members extending upward in said housing and slidably mounted in telescoping relation to one another, three elongated chains, power actuated upward extending drive means,

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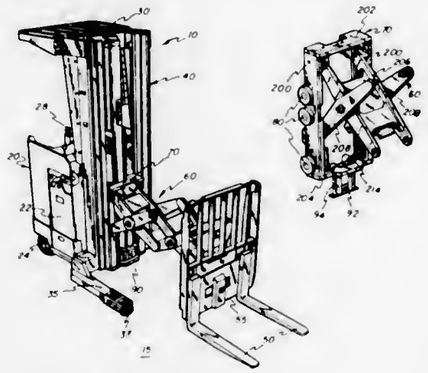
three roller means with one of said roller means mounted to the top of said power actuated upward extendable drive means, a second of said roller means mounted to the top of a first one of said three telescoping members, a third one of said roller means mounted to the top of a second one of said three telescoping members, each of said chains having opposite ends below their respective roller means, said first of said chains having its one end attached to said housing and its other end attached to the lower end of a first one of said telescoping members, a second of said chains having one of its ends attached adjacent the top of said first telescoping members and its other end attached to the lower end of a second of said three telescoping members a third of said chains having its one end attached adjacent the top of said second telescoping member and its other end attached to the lower end of said third telescoping member, whereby actuation of said upward extendable drive means causes said one roller on top thereof to engage and raise said first chain intermediate its ends with one of its ends held from rising causing the other of its ends and the first telescoping member by its lower end to raise upward in reaction thereto with the raising of the first telescoping member causing the second roller on top thereof to engage and raise the second chain intermediate its ends thereby raising the other end of the second chain and sliding upward the second telescoping member by its lower end with respect to the first telescoping member, with the raising of the second telescoping member causing the third roller on the top thereof to engage the third chain intermediate its ends thereby raising the other end of the third chain and the third telescoping member by its lower end relative to the first and second telescoping member, said apparatus including a detachable platform having a detachable connection with said housing, said platform having a reservoir for holding fluid, a fluid pump, an electric motor with a battery for powering said motor, said power actuated upward extending drive means comprising a fluid actuated piston and cylinder on said housing, a fluid connection between said reservoir and said pump and a hose connection between said pump on said platform and said fluid cylinder said housing, said hose connection having a detachable connection between said pump and cylinder.

5,586,620

REMOTE VIEWING APPARATUS FOR FORK LIFT TRUCKS

Ned E. Dammeyer, New Bremen; Todd M. Fullenkamp, Coldwater, and Harold A. Stammen, New Bremen, all of Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Filed May 12, 1995, Ser. No. 439,985
Int. Cl.[6] B66F *9/08;17/00*
U.S. Cl. 187—227 **25 Claims**



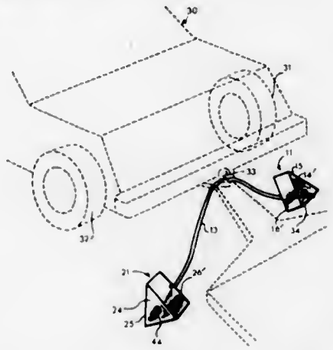
1. A fork lift truck including
a mast assembly,
a carriage assembly mounted for vertical movement in said mast assembly,
a pair of forks extending from said carriage assembly for supporting a load,
means for raising and lowering said carriage assembly,
a camera mounted near the plane of said forks, said camera viewing the scene immediately in front of the forks,
means for positioning said camera at a first predetermined location below said forks when the forks are in a raised position and for raising the camera to a protected position when said forks are in their lowermost position, and
a display terminal for presenting to an operator the image of the scene viewed by the camera.

5,586,621

SAFETY CHOCKS FOR BOAT TRAILERS AND THE LIKE

Tracy L. Moon, 1524 Wolfsnare Rd., Virginia Beach, Va. 23451, and Lewis C. Schlener, 1718 Sunset Pl., Ft. Myers, Fla. 33901

Filed Oct. 16, 1995, Ser. No. 544,259
Int. Cl.[6] B60T *3/00*
U.S. Cl. 188—4 R **3 Claims**



1. A method of removing wheel blocks from behind the rear wheels of a vehicle hitched to a trailer, comprising passing a flexible member connected to the blocks over the trailer hitch in such a way that when the vehicle moves forward, a portion of the flexible member moves with it, dragging the blocks out of the way of the trailer.

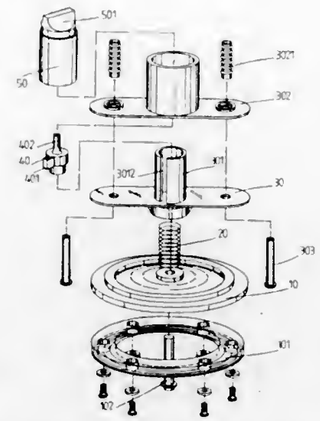
5,586,622

BRAKE OF A BABY'S WALKER

Stephen Hu, No. 2, Ta Ton Road, Hsinchu Industrial Area, Hu Kou, Hsinchu, Taiwan

Filed Mar. 1, 1995, Ser. No. 396,955
Int. Cl.[6] B62B *9/08*
U.S. Cl. 188—20 **7 Claims**

1. A brake for a baby's walker, comprising:
an inlay board;
a connected tube having an opening and an inner periphery, said connected tube fixed on said inlay board;
a support cylinder having a base, said base being connectable to said inlay board;
a revolving casing having a helical guide, said revolving casing rotatably positioned between said connected tube and said support cylinder;
a slide having a horizontal piece, said slide movably engaging said inner periphery of said connected tube and said horizontal piece movably engaging said helical guide through said opening in said connected tube;



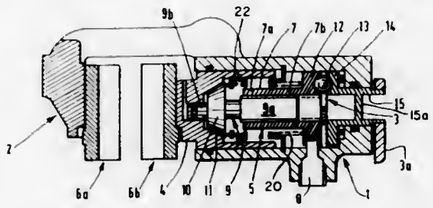
a spring disposed within said connected tube biasing said horizontal piece of said slide against said helical guide;
a brake pad; and
a support pole having a first end and a second end, said first end rotatably engaging said brake pad and said second end fixedly engaging said slide, wherein
rotation of said revolving casing causes said horizontal piece to move vertically within said opening in accordance with said helical guide, thereby vertically displacing said support pole and said brake pad.

5,586,623

REDUCED-BULK BRAKE MOTOR

Jean-Claude Mery, Pavillons-Sous-Bois, France, assignor to AlliedSignal Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/00918, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO94/09285, PCT Pub. Date Apr. 28, 1994
PCT Filed Sep. 22, 1993, Ser. No. 133,074
Claims priority, application France, Oct. 22, 1992, 92 12638
Int. Cl.[6] F16D *65/56;65/16*
U.S. Cl. 188—72.6 **2 Claims**



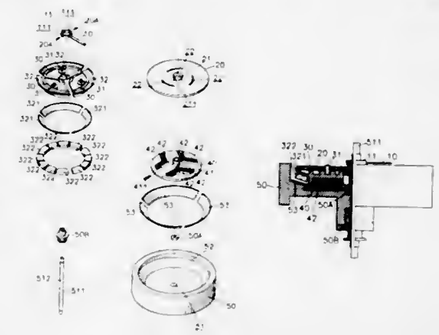
1. A brake motor comprising: an essentially cylindrical body filled with a hydraulic fluid subjected to a variable pressure; a mechanical actuator comprising a control member which can be accessed from outside the body; a brake piston closing off the body in leaktight fashion and capable of sliding therein under the effect of the actuator in order to actuate at least one friction member; and an automatic adjustment device arranged inside the body between the mechanical actuator and the piston to take up the play resulting from wear of the friction member, the device comprising: a rotationally fixed elongate nut, a first end of which receives a selectively rotary screw engaged therein by a first screw end, a second end of the nut capable of receiving a thrust from the mechanical actuator, and a second end of the screw passing through the piston in leaktight fashion in order to be subjected to atmospheric pressure and having a tapered shoulder capable of being selectively rotationally blocked by an internal tapered, rotationally fixed surface of the piston against which the shoulder is pressed with a force which increases with the pressure of the hydraulic fluid, characterized in that the mechanical actuator comprises two plates capable of relative rotation, the first plate fastened securely to the second end of the elongate nut, and the second plate connected to a spindle passing through the body in leaktight fashion.

5,586,624

FLY WHEEL BRAKE DEVICE FOR AN EXERCISE BICYCLE

Wen-Chung Ko; Kent Ko, and Chin-Jen Fu, all of No. 342, Ta tung Rd., Kwei San Hsian, Tau Yuan Shien, Taiwan

Filed Sep. 1, 1995, Ser. No. 522,927
Int. Cl.[6] A63B *22/06;* **B60L** *7/00*
U.S. Cl. 188—164 **6 Claims**



1. A flywheel brake device for an exercise bicycle comprising:
a fixed axle;
a rotary disc having a hollow flange at a center thereof for rotatively coupling said rotary disc to said fixed axle, said rotary disc having a plurality of cambered slots formed therethrough, said cambered slots being angularly displaced one from the other about said center by a predetermined angle, each of said cambered slots including a far and a near end thereof, said far end being positioned at a first predetermined radial distance from said hollow flange and said near end being positioned at a second predetermined radial distance from said hollow flange, said first predetermined radial distance being greater than said second predetermined radial distance;
a rotary handle fixedly coupled to said hollow flange of said rotary disk for rotatively displacing said rotary disk relative to said fixed axle;
a fixing rail disc having a hollow sleeve spindle extending from a central portion, said hollow sleeve spindle being fixedly coupled to said fixed axle for securing said fixing rail disc in spaced relationship with said rotary disc, said fixing rail disc having substantially planar opposing first and second sides, said first side having a plurality of V-shaped rails formed thereon;
a plurality of substantially identical sector shaped sliding blocks disposed on said V-shaped rails of said fixing rail disc, said plurality of sliding blocks being arranged adjacent each other about said fixed axle, each of said sliding blocks having substantially planar first and second opposing surfaces, said first surface being positioned adjacent said rotary disc and having formed thereon a plurality of convex columns extending from said first surface for respective insertion into said plurality of cambered slots of said rotary disc, each of said cambered slots defining a cambered path along which a respectively inserted convex column travels responsive to a bi-directional rotative displacement of said rotary disc, each of said sliding blocks correspondingly sliding radially inward

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and radially outward as its convex column traverses a respective one of said cambered paths responsive to said rotative displacement of said rotary disc, each of said sliding blocks including an arcuate outer edge from which extends a cambered surface for supporting a plurality of permanent magnets thereon;

a flywheel formed of a magnetic material and rotatively coupled to said fixed axle, said flywheel having a driving element fixedly coupled to a central portion thereof for rotatably driving said flywheel about said fixed axle, said flywheel having a substantially annular cavity formed in one side thereof for positioning therein said rotary disc, said plurality of sliding blocks and said fixing rail disc, said annular cavity including a bevelled magnetic surface positioned adjacent said second side of said fixing rail disc, said bevelled magnetic surface having adhered thereto a layer of a non-magnetic metal, said bevelled magnetic surface and said plurality of permanent magnets of said plurality of sliding blocks having defined therebetween a magnetic gap of adjustable width; and,

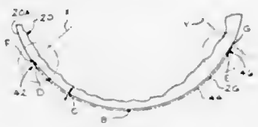
a flywheel brake operating cable coupled to said rotary handle for effecting said bi-directional rotative displacement of said rotary disc relative to said plurality of sliding blocks, said magnetic gap respectively narrowing and widening as said sliding blocks slide radially inward and outward in response to said bi-directional rotative displacement of said rotary disc to vary the magnetic coupling between said magnetic flywheel and said integral and permanent magnets of said plurality of sliding blocks.

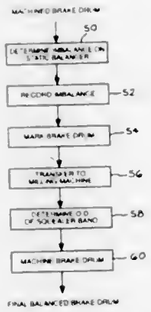
5,586,625

METHOD FOR FINAL BALANCING A BRAKE DRUM

Jay K. Julow, Louisville, Ky.; Robert A. DeRegnaucourt, Centerville, and John C. Hall, Kettering, both of Ohio, assignors to Dayton Walther Corporation, Dayton, Ohio

Division of Ser. No. 76,986, Jun. 14, 1993, Pat. No. 5,483,855.
This application Dec. 13, 1995, Ser. No. 572,227
Int. Cl.[6] B23C *3/34;* **F16D** *65/10*
U.S. Cl. 188—218 R **4 Claims**





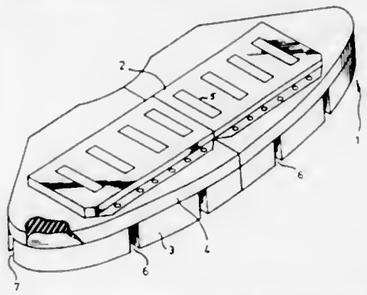
1. A final balanced brake drum comprising a generally cylindrical body provided with an integral raised squealer band, said squealer band having an outwardly facing surface initially machined to a predetermined diameter around its entire circumference, said brake drum having the initially machined squealer band incorporating an unacceptable imbalance, said squealer band being further machined to produce a cut at a predetermined location along said squealer band, said cut having a circumferentially extending substantially constant depth which extends along a predetermined length of said squealer band, with said predetermined location, depth, and length being selected to produce a brake drum which corrects the imbalance.

5,586,626

BRAKES

Keith D. Dolbear, Buxton; Trevor W. Beamond, Matlock, and Kerry G. Schofield, Breadsall, all of England, assignors to Ferodo Limited and British Railways Board, England

Continuation of Ser. No. 204,239, Mar. 9, 1994, abandoned.
This application May 31, 1995, Ser. No. 455,249
Claims priority, application United Kingdom, Nov. 15, 1991, 9124381
Int. Cl.[6] F16D *65/02,69/04*
U.S. Cl. 188—250 B **5 Claims**



1. A brake element for engaging a surface of a moving component of a brake system, comprising a lining secured to a backing plate, wherein the lining includes a layer of elastomeric material and a layer of friction material, the layer of elastomeric mateiral having a Rockwell value of a depth of penetration of greater than 0.30 millimeter penetration and at least twice that of the layer of friction material, and wherein the layer of elastomeric material is interposed between the layer of friction material and the backing plate, thereby permitting the lining to more closely conform to the moving component and to thereby also reduce hot spotting of the surface of the moving component.

5,586,627

HYDRAULIC SHOCK ABSORBER OF DAMPING FORCE ADJUSTABLE TYPE

Takashi Nezu, Tokyo, and Akira Kashiwagi, Kanagawa-ken, both of Japan, assignors to Tokico, Ltd., Kanagawa-ken, Japan

Filed May 19, 1994, Ser. No. 246,299
Claims priority, application Japan, May 20, 1993, 5-141437; Oct. 20, 1993, 5-286111; Mar. 18, 1994, 6-074471; Mar. 31, 1994, 6-085591
Int. Cl.[6] F16F *9/46;* **B62K** *25/10*
U.S. Cl. 188—299 **8 Claims**

1. A hydraulic shock absorber comprising:

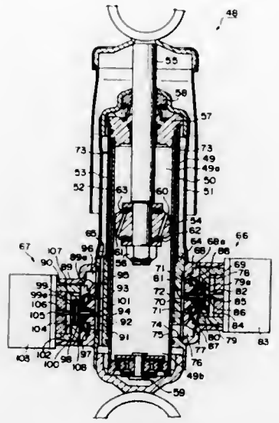
a hollow cylinder for containing a hydraulic fluid;

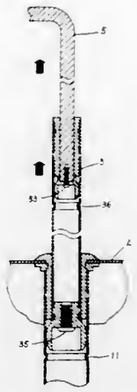
a piston, provided in said cylinder, and dividing the interior of said cylinder into an extension-side chamber and a contraction side chamber;

a piston rod having a first end connected to said piston and a second end extending out of said cylinder;

an extension-side passage connecting said two cylinder chambers with each other so that hydraulic fluid can flow in the extension-side passage during an extension stroke of said piston;

an extension-side damping force generating valve provided in said extension-side passage for generating a damping force during an extension stroke of said piston;





an extension-side back pressure chamber operatively associated with said extension-side damping force generating valve;

an extension-side back pressure passage for transmitting hydraulic fluid pressure in said extension-side passage, at a point upstream of said extension-side damping force generating valve, to said extension-side back pressure chamber through a pressure reducing orifice, wherein hydraulic fluid pressure established in said back pressure chamber urges said damping force generating valve toward a closed position;

an extension-side back pressure adjusting valve in fluid communication with said extension-side back pressure chamber through said extension-side back pressure passage, wherein said extension-side back pressure adjusting valve controls discharge of hydraulic fluid from said back pressure chamber to a low pressure area;

a contraction-side passage connecting said two cylinder chambers with each other so that hydraulic fluid can flow in the contraction-side passage during a contraction stroke of said piston;

a contraction-side damping force generating valve provided in said contraction-side passage for generating a damping force during a contraction stroke of said piston;

a contraction-side back pressure chamber operatively associated with said contraction-side damping force generating valve;

a contraction-side back pressure passage for transmitting hydraulic fluid pressure in said contraction-side passage, at a point upstream of said contraction-side damping force generating valve, to said contraction-side back pressure chamber through a pressure reducing orifice, wherein hydraulic fluid pressure established in said back pressure chamber urges said damping force generating valve toward a valve-closing position; and

a contraction-side back pressure adjusting valve in fluid communication with said contraction-side back pressure chamber through said contraction-side back pressure passage, wherein said contraction-side back pressure adjusting valve controls discharge of hydraulic fluid from said back pressure chamber to a low pressure area.

5,586,628

STRUCTURE OF A TELESCOPIC HANDLE FOR WHEELED LUGGAGE

Yuan L. Wang, P.O. Box 82-144, Taipei, Taiwan

Continuation-in-part of Ser. No. 363,946, Dec. 27, 1994. This application Jun. 5, 1995, Ser. No. 463,769
Int. Cl.[6] A45C *13/26;5/14*
U.S. Cl. 190—115 **3 Claims**

1. A telescopic handle for a wheeled luggage piece comprising:

a pair of sleeves each including a tubular portion having an axial hole, a flange at an upper end, an external annular groove under said flange, and a pair of external protuberances under said groove, said sleeves being mounted on an upper panel of a wheeled luggage piece with said flange located on said upper panel and fixedly kept in place by a retainer engaged with said external groove below said upper panel;

a pair of outer tubes each formed with a pair of holes aligned with said external protuberances and adapted to receive said protuberances when extended over one of said sleeves, said outer tubes further having a circular projection on an inner surface under said holes;

a pair of inner tubes each formed with a pair of first holes, a circular projection on an inner surface under said first holes, and a pair of second holes under said circular projection;

a pair of tubular members each having a flange at an upper end and a pair of external protuberances under said flange of said tubular member aligned with said first holes of said inner tube, each of said tubular members being inserted into one of said inner tubes with said flange of said tubular member on an upper end of said inner tube and said external protuberances of said tubular member engaged with said first holes of said inner tube;

an inverted U-shaped member having two downwardly depending legs each formed at a lower end with a threaded axial hole, each of said legs being inserted into one of said inner tubes through said tubular members;

a pair of first plugs each including a cylindrical portion having a cavity at an upper end dimensioned to receive a lower end of said leg of said inverted U-shaped member, a center hole, and a plurality of slits at a lower portion;

a pair of first screws each extending upwardly through the center hole of each of said first plugs to engage with the threaded axial hole of one of said legs of said inverted U-shaped member;

a pair of second plugs each including a cylindrical portion having a divergent center hole with internal threads, a pair of external protuberances aligned with said second holes and adapted to engage with said second holes of one of said inner tubes, and a plurality of axial slits at a lower portion; and

a pair of second screws each extending upwardly to engage with said divergent center hole of each of said second plugs.

5,586,629

PRESURE CONTROLLED SYSTEM FOR FILLING AN IMPLANTABLE DRUG INFUSION PUMP

Bret R. Shoberg, Corcoran, and Kenneth T. Heruth, Maple Grove, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 13, 1995, Ser. No. 422,362
Int. Cl.[6] B65B *1/04;3/04*
U.S. Cl. 141—21 **13 Claims**

13. A method of filling a drug infusion pump with a fluid while preventing over-pressurization of said pump, comprising the steps of:

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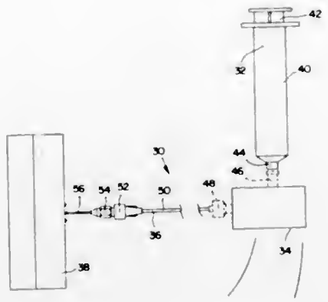


coupling a filling syringe containing a preselected amount of said fluid to the inlet of a pressure regulating valve;

coupling the outlet of said pressure regulating valve to a hypodermic needle;

inserting said hypodermic needle into said pump; and

actuating said filling syringe to pass fluid through said pressure regulating valve and into said pump until the pressure of said fluid passing through said pressure regulating valve achieves a preselected maximum at which time said pressure regulating valve closes to prevent further flow of fluid into said pump.

5,586,630

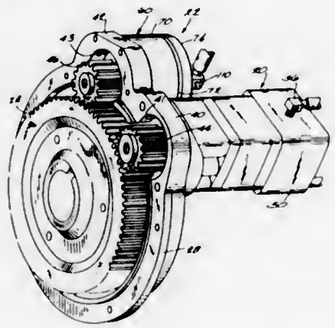
SPRING APPLIED/FLUID RELEASED PARKING BRAKE

Gregory J. Orzal, Hartford, Wis., assignor to Wacker Corporation, Menomonee Falls, Wis.

Filed May 15, 1995, Ser. No. 440,908

Int. Cl.[6] B60K *41/26*

U.S. Cl. 192—4 R **18 Claims**



1. A braking system comprising:

(A) a drive train having a toothed rotatable component; and

(B) a parking brake assembly for preventing undesired rotation of said rotatable component, said parking brake assembly comprising a stationary member and a piston which 1) presents a toothed member meshing with the teeth of said rotatable component and which 2) is movable axially from a first position in which said piston is locked to said stationary member such that said and said rotatable component are mechanically locked from rotation with respect to said stationary member to a second position in which said piston is unlocked from said stationary member such that said piston and said rotatable component are freely rotatable with respect to said stationary member.

5,586,631

WINDOW SHADE

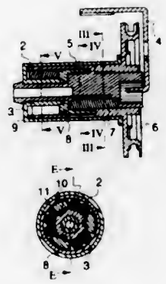
Siegfried Benthin, Bremerhaven, Germany, assignor to Benthin Aktiengesellschaft, Bremerhaven, Germany

Filed Dec. 22, 1994, Ser. No. 363,513

Claims priority, application Germany, Dec. 24, 1993, 43 44 627.2

Int. Cl.[6] E06B *9/84*

U.S. Cl. 192—8 R **12 Claims**



1. Window shade, comprising:

a winding shaft;

a shaft sleeve projection rigidly mounted on the winding shaft, said shaft sleeve projection having an inner surface;

stationary pivots for rotatably mounting the winding shaft, one of said pivots being provided at each end of the winding shaft, a first pivot of said pivots having a pivot sleeve projection, a recess being defined between an inner jacket surface of said pivot sleeve projection and an outer jacket surface of said shaft sleeve projection, said recess being wedge-shaped in a circumferential direction;

opening element means arranged in said recess, said opening element means including an opening element;

a drive member coupled to said first pivot and engaged with said opening element for moving said opening element; locking member means for interlocking the winding shaft loaded in the roll-off direction of the window shade with said first pivot, to maintain the winding shaft stationary, said locking member means including at least one rolling body clamped in said recess, in a clamped position, said rolling member being released from the clamped position by movement of said opening element, by said drive member in the direction of rotation.

5,586,632

PULSE ACTUATED INTERLOCK MECHANISM

Jon Bigley, 43120 Barchester, Canton, Mich. 48187, and Evan Baker, 2017 SW. 6th Ave., Camas, Wash. 98607

Continuation-in-part of Ser. No. 143,086, Oct. 26, 1993, Pat. No. 5,535,869. This application Jun. 7, 1995, Ser. No. 485,784

Int. Cl.[6] F16D *11/14;25/04;* **B25B** *7/12;* **B60B** *5/00*

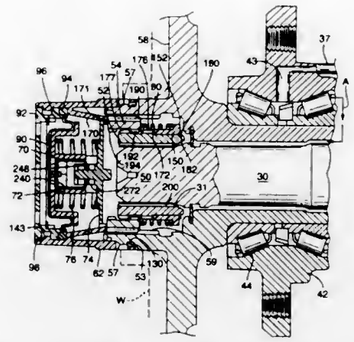
U.S. Cl. 192—69.41 **11 Claims**

1. In a device including a drive member and a driven member a pulse actuated interlocking mechanism for releasably interlocking the drive member and driven member comprising:

a clutch member between the drive and driven members and slidable between first and second positions, said clutch member in the first position engaged with one of the drive and driven members and the clutch member in the second position engaged with both of the drive and driven members;

a first biasing member continuously urging the clutch member to one of the first and second positions;

a piston assembly selectively urging the clutch member to the other of the first and second positions, said piston assembly including first and second pistons, a second biasing member urging and second pistons apart to an expanded condition and



a latch mechanism for latching the first and second pistons together in a contracted condition and thereby constraining the second biasing member, said latch mechanism responsive to first and second compressive forces compressing said pistons together for latching and unlatching said latch member mechanism; and

said piston assembly arranged relative to said clutch member whereby the expanded condition of the piston assembly urges the clutch member to the other of the first and second positions and whereby the contracted condition allows the first biasing member to urge the clutch member to said one of the first and second positions.

5,586,633

CLUTCH COVER ASSEMBLY

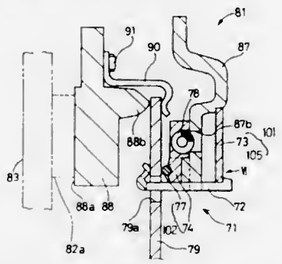
Hiroshi Mizukami; Noribisa Uenohara, and Hiroshi Takeuchi, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 117,425, Sep. 7, 1993, Pat. No. 5,431,268. This application Apr. 6, 1995, Ser. No. 417,993

Claims priority, application Japan, Sep. 7, 1992, 4-62612 U; Dec. 25, 1992, 4-346511

Int. Cl.[6] F16D *13/75*

U.S. Cl. 192—70.25 **16 Claims**



1. A clutch cover assembly, comprising:

a friction member connected to an output member, said friction member engaging with an input rotation member when pressed toward said output member;

a clutch cover fixed to said input rotation member;

a pressure plate located within said clutch cover for pressing said friction member;

an urging member for urging said pressure plate toward said friction member, said urging member being a diaphragm spring, radially outward end of which urges said pressure plate;

a support mechanism movable toward said friction member and for supporting said urging member, wherein said support mechanism includes a first support mechanism movable toward said friction member from said pressure plate side, and a second support mechanism movable toward said friction member from the opposite side of said pressure plate, said first support mechanism and said second support mechanism supporting radially middle portion of said diaphragm spring; and

a movement regulation mechanism for moving said support mechanism toward said friction member according to wear displacement of said friction member, wherein said movement regulation mechanism includes a restriction member for permitting said first support mechanism to move toward said friction member according to wear displacement of said friction member, and an urging mechanism for urging said second support mechanism toward said friction member in order to move said second support mechanism according to movement of said first support mechanism, said movement regulation mechanism permits said support mechanism to move toward said friction member when said diaphragm spring releases its urging force against said pressure plate.

5,586,634

CLUTCH MECHANISM, ESPECIALLY FOR A MOTOR VEHICLE

Jacques Thirion de Briel, Colombes, France, assignor to Valeo, Paris, France

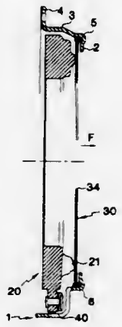
PCT No. PCT/FR93/01266, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO94/13970, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 17, 1993, Ser. No. 284,487

Claims priority, application France, Dec. 17, 1992, 92 15246

Int. Cl.[6] F16D *13/50*

U.S. Cl. 192—70.27 **2 Claims**



1. A clutch mechanism comprising a hollow cover plate having at its outer periphery an annular skirt, oriented generally axially, at least one pressure plate, which is coupled in rotation to the cover plate through attachment means which enables said pressure plate to be displaced axially with respect to said cover plate, and, between the cover plate and the pressure plate, a diaphragm the outer periphery of which defines a Belleville ring, which, firstly, bears at its outer periphery on a deflection abutment carried by the cover plate, and, secondly, bears at its inner periphery on a protecting element of the pressure plate so as to urge said plate in a direction in which it is displaced away from the cover plate, characterised in that the deflection abutment is of elastic material and carries an integral centring extension, oriented generally axially and interposed radially between the inner periphery of the skirt of the cover plate and the outer periphery of the diaphragm, characterised in that the extension is provided at its free end with a transverse flange directed towards the axis of the assembly, in such a way that the deflection abutment caps the Belleville ring of the diaphragm.

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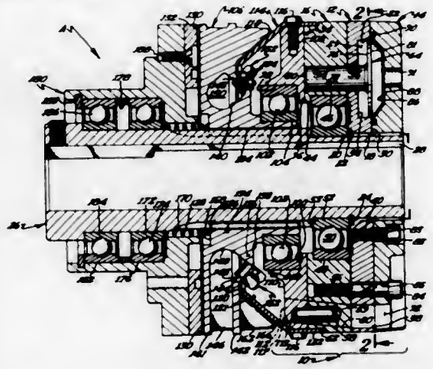
5,586,635

ROTATIONAL CONTROL APPARATUS

Chris Nelson, Roseville; David R. Hennessy, Minneapolis, and James P. LeClaire, St. Paul, all of Minn., assignors to Horton, Inc., Minneapolis, Minn.

Filed Mar. 31, 1995, Ser. No. 414,279
Int. Cl.[6] F16D 25/06
U.S. Cl. 192—85 A 28 Claims



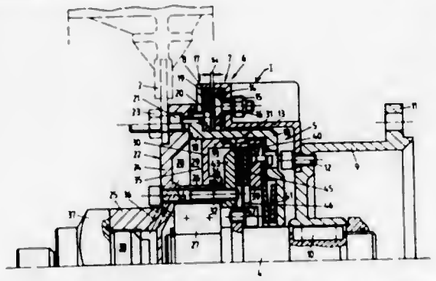
1. Rotational control apparatus comprising, in combination: an input having an annular interface disc; an output having an annular interface disc, with the input being rotatable relative to the output about an axis, with the interface discs being concentric to the axis and having a first condition where the interface discs are rotatably related to each other and a second condition where the interface discs are rotatably independent from each other; first means for moving the interface discs from the first condition to the second condition; second means for moving the interface discs from the second condition to the first condition; and third means for moving the interface discs from the second condition to the first condition and which is controllable both independently and in combination with the second means.

5,586,636

FRICTION CLUTCH, PARTICULARLY FOR A FAN WHEEL OF A MOTOR VEHICLE ENGINE FAN

Karl-Heinz Linnig, Schillerstrasse 10, 88677 Markdorf, Germany

Filed Jul. 14, 1994, Ser. No. 274,688
Claims priority, application Germany, Jul. 15, 1993, 43 23 651.0
Int. Cl.[6] F16D 29/00
U.S. Cl. 192—48.2 12 Claims



12. A clutch assembly for a fan wheel of an internal combustion engine, comprising:

a friction disc clutch and an eddy-current clutch, each being arranged in parallel to each other, and each being locatable between the engine and fan wheel and connectable thereto for transmitting a force from the engine to the fan wheel;

said eddy-current clutch having a first portion connectable to a drive shaft to rotate therewith, and a second portion adjacent to the first portion of said eddy-current clutch and connectable to the fan wheel, said first and second portions being axially spaced from one another by a preselected distance, said distance remaining constant regardless of whether said friction disc clutch is engaged or disengaged;

means for engaging said friction disc clutch using a fluid pressurized medium so that the fan wheel is directly connected to the engine and is rotated at an engine rotational speed; and

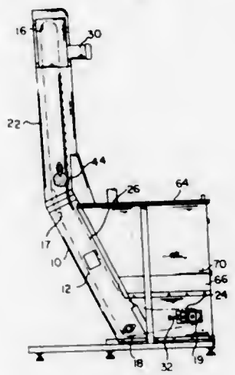
means for disengaging said friction disc clutch using the fluid pressurized medium so that said eddy-current clutch entrains the fan wheel and rotates the fan wheel at a speed less than the engine rotational speed.

5,586,637

VARIABLE ANGLE CONVEYOR ASSEMBLY WITH STEPPED CLEAT

Samuel S. Aidlin, 5079 Village Garden Dr., Sarasota, Fla. 34234; Stephen H. Aidlin, 1521 Eastbrook Dr., Satasota, Fla. 34231; Larry Kincaid, 2635 Hyde Park St., Sarasota, Fla. 34239; Kenneth Cordonnier, 1970 Seton Dr., Clearwater, Fla. 34623; Robert Ledwith, 6210 99th St., E. Bradenton, Fla. 34202, and Robert J. Hencke, 302 73rd St., NW. Bradenton, Fla. 34209

Continuation-in-part of Ser. No. 199,737, Feb. 22, 1994, Pat. No. 5,394,972. This application Jan. 30, 1995, Ser. No. 380,638
Int. Cl.[6] B65G 47/24
U.S. Cl. 198—397 17 Claims



2. A conveying system for lifting and orienting multi-diameter push-pull caps comprising:

a conveyor belt formed of articulated sections and with guide rollers to support the belt with an upper section having an essentially vertical path of travel and a lower section with an angled path of travel;

sprockets on the guide rollers to effect movement of the belt in a path of travel through the lower section and then the upper section;

a plurality of cleats secured to the exterior surface of the conveyor belt, the cleats having supporting treads extending at right angles from the exterior surface of the conveyor belt for retaining push-pull caps thereon in a proper orientation when a nose of the push-pull cap is in contact with the conveyor belt and a plurality of cylindrical edges of the push-pull cap is supported on the supporting treads of the cleats but to effect the dropping thereof when the push-pull caps are not in the proper orientation;

a supplemental sprocket in contact with the interior face of the conveyor belt in the lower extent of the upper section to form an outwardly directed bow in the belt and effect the removal, by gravity, of push-pull caps not in the proper orientation; and

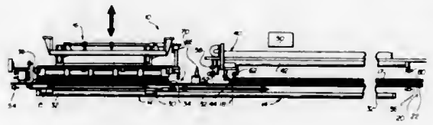
adjustment means to vary the extent of the bow as a function of the particular bottle cap being conveyed.

5,586,638

DISCHARGE APPARATUS FOR ARTICLE HANDLING SYSTEM

Andrew E. Mojden, Hinsdale, and Richard P. Hoinacki, Oak Lawn, both of Ill., assignors to Fleetwood Systems, Inc., Romeoville, Ill.

Continuation of Ser. No. 10,747, Jan. 29, 1993, Pat. No. 5,449,060. This application Mar. 28, 1995, Ser. No. 390,080
Int. Cl.[6] B65B 35/40
U.S. Cl. 198—419.1 9 Claims



8. A discharge apparatus for an article handling system, said discharge apparatus receiving a group of facewise stacked articles having a leading end and a trailing end and delivering said group of articles to an outfeed apparatus wherein the articles are assimilated into a generally continuous flow, said discharge apparatus comprising: a first stage station for receiving a group of article; a discharge station having an incoming end associated with said first stage station and an outgoing end adjacent said outfeed apparatus; an article carrying lane extending through said first stage station and said discharge station; a reciprocating shuttle having a leading end support and a trailing end support for holding end leading end and said trailing end of said group of stacked articles and transporting a group of articles from said first stage station to said discharge station; a reciprocating discharge carriage having an article engager extending therefrom for engaging said trailing end of said group of stacked articles for advancing articles received from said shuttle through said discharge station to said outfeed apparatus; and an operating device associated with said shuttle and with said discharge carriage for operating said shuttle to position a leading end of a group of articles into abutment with a trailing end of articles at said discharge station and for operating said discharge carriage to advance said articles toward said outgoing end of said discharge station; whereby reciprocation of said shuttle and said discharge carriage maintain the trailing end of said generally continuous flow to said outfeed apparatus and the leading and trailing ends of a group of articles and facilitate assimilation of said group of articles into said generally continuous flow.

5,586,639

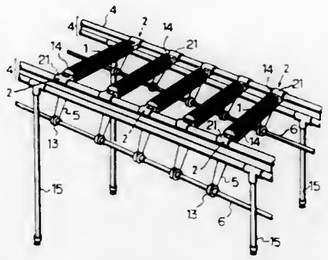
POWERED ROLLER CONVEYER FOR LIGHT LOADS

Shuji Yoshino, Shizuoka, Japan, assignor to Yazaki Industrial Chemical Co., Japan

Filed Dec. 12, 1994, Ser. No. 355,267
Int. Cl.[6] F16H 55/08; B65G 13/04
U.S. Cl. 198—690.2 3 Claims

1. A powered roller conveyor for light loads comprising rollers made of steel pipes with a synthetic resin coating fixed to the steel pipes;

bearings rotatably supporting each end of each roller;



conveyor frames to support said bearings such that said rollers are arranged transversely to said conveyor frames and are regularly spaced over a length of said conveyor frames; and

driving means for driving said rollers in a common direction at an equal peripheral velocity;

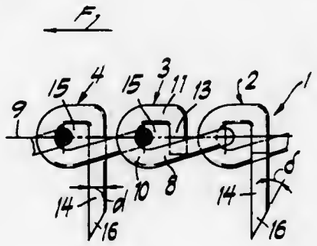
wherein said coating resin of said rollers is a soft polyurethane rubber of a hardness of 65 to 80 degrees and in that each of said rollers has a transverse section having on the outer periphery slender trapezoidal ridges that are arranged at a pitch of about 3 mm, having a height of about 2 mm and extend axially to be parallel with each other to form an undulating surface.

5,586,640

CONVEYOR CHAIN

Ingolf Kraut, Balingen, Germany, assignor to Bizerba-Werkr Wilhelm Kraut GmbH & Co. KG, Balingen, Germany

PCT No. PCT/EP93/03181, § 371 Date Jul. 6, 1995, § 102(e) Date Jul. 6, 1995, PCT Pub. No. WO94/11279, PCT Pub. Date May 26, 1994
PCT Filed Nov. 12, 1993, Ser. No. 428,089
Claims priority, application Germany, Nov. 13, 1992, 9215323 U
Int. Cl.[6] B65G 15/42
U.S. Cl. 198—692 17 Claims



1. A chain for conveying slices of a food product including in combination a plurality of interlocking links formed of wire, each link having a U shape and comprising a crossbar and two legs, each leg being bent from the crossbar by more than 90° whereby the legs are inclined toward one another, the legs terminating in loops having endpieces which are bent through at least 180° and at least partially surround the crossbar of an adjacent link, a predetermined number of links having at least one loop the endpiece of which is bent through at least 270° and comprises an elongated tip extending appreciably from and at substantially right angles to the plane of the chain.

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5,586,641

APPARATUS FOR FEEDING SLIVERS TO A DRAWING FRAME

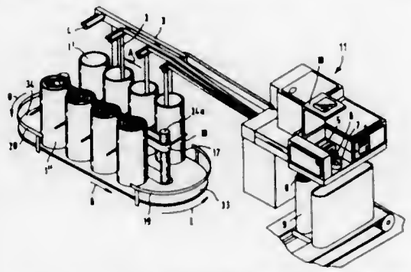
Ferdinand Leifeld, Kempen, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

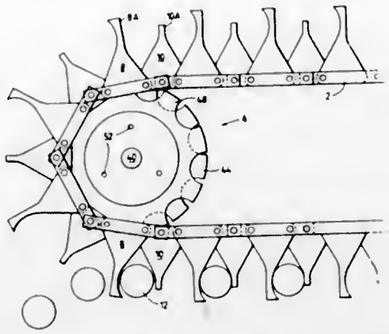
Continuation-in-part of Ser. No. 278,147, Jul. 21, 1994, abandoned. This application Feb. 21, 1995, Ser. No. 391,276

Claims priority, application Germany, Jul. 22, 1993, 43 24 540.4

Int. Cl.[6] B65G *19/00*

U.S. Cl. 198—720 **22 Claims**





1. An apparatus for advancing sliver-filled coiler cans into a position at a sliver-intake side of a drawing frame and for removing empty coiler cans from said position; the apparatus comprising

(a) an endless track including

(1) a first track portion including said position and structured to accommodate a first plurality of coiler cans;

(2) a second track portion structured to accommodate a second plurality of coiler cans; said first and second track portions extending generally side by side;

(3) two arcuate deflecting track portions interconnecting said first and second track portions at opposite ends thereof;

(b) an endless circulating transporting chain extending along said endless track;

(c) a plurality of spaced pusher arms mounted on the chain and extending therefrom to individually engage a coiler can and advancing each can on said endless track as the chain circulates, whereby said pusher arms advance the coiler cans on said first track portion in a first direction and on said second track portion in a second direction; said first and second directions being opposite to one another; said spaced pusher arms defining at all times a plurality of can positions for said first plurality of coiler cans on said first track portion and a plurality of can positions for said second plurality of coiler cans on said second track portion;

(d) can retaining means for preventing the cans from leaving the deflecting track portions during travel thereon;

(e) a motor connected to the transporting chain for circulating said transporting chain; and

(f) motor actuating means for intermittently initiating consecutive operating cycles of said transporting chain such that during each operating cycle the first plurality of coiler cans positioned on said first track portion is moved as a single batch to said second track portion and the second plurality of coiler cans positioned on said second track portion is moved as a single batch to said first track portion.

5,586,642

CONVEYOR SYSTEMS

Christopher J. Hawkins, Burnham, United Kingdom, assignor to BWI KartridgPak Co., Davenport, Iowa

Filed Nov. 13, 1995, Ser. No. 557,996

Claims priority, application United Kingdom, Nov. 26, 1994, 9423936

Int. Cl.[6] B65G *17/34*

U.S. Cl. 198—803.11 **8 Claims**

1. A conveyor system for conveying upright cylindrical objects along a predetermined vertical path, defined by a predetermined vertical loop, said system comprising

first and second vertically oriented elongate endless members,

first and second vertically oriented rotary assemblies positioned at opposite ends of the loop to constrain the elongate members to be driven in synchronism around said predetermined loop,

a plurality of longitudinally and vertically spaced, horizontally and outwardly-directed, vertically thin fingers independently mounted on each member and arranged to independently engage said cylindrical objects at vertically spaced locations on opposite sides and displace said cylindrical objects along said predetermined path,

adjustment means for effecting relative longitudinal displacement between such endless members to vary the spacing between each finger on one said member relative to a corresponding finger on the other said member in a sense to equal the diameter of the cylindrical object whereby to close the fingers up on said object when inserted between the fingers.

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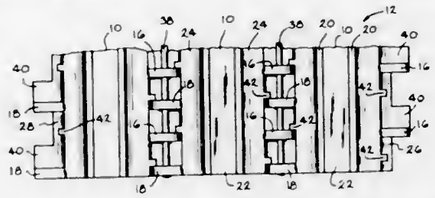
MODULAR BELTING HAVING ANTIMICROBIAL CHARACTERISTICS AND METHOD OF MANUFACTURE

Florian S. Zabron, Orchard Park; Mary E. Marlette, Suyder; Miles S. Rothman, Williamsville, all of N.Y., and William D. Hanrahan, Charlotte, N.C., assignors to Globe International Inc., Buffalo, N.Y.

Filed May 19, 1995, Ser. No. 444,738

Int. Cl.[6] B65G *17/06*

U.S. Cl. 198—853 **13 Claims**



1. A modular conveyor belting having antimicrobial characteristics that inhibit bacterial growth and promote asepsis on the belting, which comprises:

a) a plurality of like modules, each module comprised of a polymeric material and including a first plurality of link ends, a second plurality of link ends and an intermediate section integrally formed with and joining the first and second plurality of link ends, wherein the link ends of each of the modules are releasably engaged between link ends of an adjacent module except for individual link ends disposed at the extreme sides of the module;

b) a pivot rod for pivotally connecting the modules at engaged link ends, wherein the link ends of each of the modules are of a width somewhat less than the spacing between confronting link ends along the pivotal axis thereof to provide for the pivotal connection of the modules; and

c) an antimicrobial agent associated with the modules, wherein the antimicrobial agent is provided as a topical applicant applied to an exposed surface of the module or is incorporated into the polymeric material thereof, wherein the antimicrobial agent is selected from the group consisting of a chlorinated phenoxy and polyhexamethylene biguanide hydrochloride, and wherein when the antimicrobial agent is incorporated into the polymeric material comprising the modules, the antimicrobial agent exhibits controlled migration through the polymeric material to the exposed surface thereof when an imbalance of vapor pressure of the antimicrobial agent demands equalization to thereby continuously inhibit bacterial growth and promote asepsis on the belting.

5,586,644

CHAIN CONVEYOR HAVING IMPROVED RUNNING FEATURES

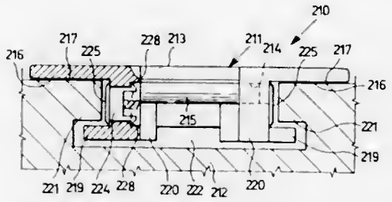
Daniele Coen, Villasanta, and Carlo Garbagnati, Castello Brianza, both of Italy, assignors to Regina Sud S.p.A., Latina, Italy

Filed Oct. 19, 1995, Ser. No. 545,097

Claims priority, application Italy, Nov. 8, 1994, MI940731 U

Int. Cl.[6] B65G *17/06*

U.S. Cl. 198—853 **4 Claims**



1. A link for a chain conveyor running along a guide comprising at least one sliding surface for moving on a said guide, with at least part of said sliding surface being a sliding element carried by said link;

said link having a transverse housing for receiving a pivot pin to enable articulation with a similar link;

said sliding element comprising a plug for fitting into a seating which transversely intersects said pivot pin housing;

said sliding element having teeth for locking into the seating, said teeth snap interfitting with an abutment edge formed by an intersection between the seating and its associated pivot pin housing.

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EXPANDING HELICAL RATCHET SWITCH

Stephen Bartok, 5687 Mistridge Dr., Rancho Palos Verdes, Calif. 90274

Continuation of Ser. No. 258,944, Jun. 13, 1994, abandoned. This application Nov. 20, 1995, Ser. No. 561,082

Int. Cl.[6] H01H *19/62*

U.S. Cl. 200—527 **23 Claims**

1. A switch for completing an electrical circuit comprising:

a housing having an aperture;

a plunger mounted within the housing projecting outward through the aperture;

at least two terminals mounted within the housing connectable with the electrical circuit;

contact means mounted within the housing for interruptably bridging the terminals;

a ratchet comprised of one moving element mounted within the housing and having a plurality of rotationally overlapping helical camming surfaces;

actuating means mounted within the housing and interfacing with the plunger for indexing the ratchet in response to movement of a portion of the plunger into and out of the housing; and

biasing means mounted within the housing for urging the plunger outward from the housing.

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VEHICLE LOCKING SYSTEMS

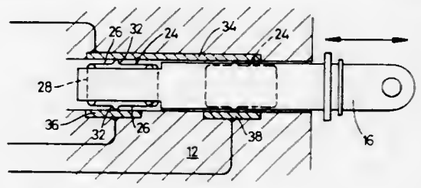
Mark Bridgeman, 106 Kelsey Lane, Balsall Common, Coventry, United Kingdom, and Pierre Periou, Fordhouse Lane, Stirchley, Birmingham, West Midlands B30 3BW, United Kingdom

Continuation of Ser. No. 75,635, Jun. 11, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,631

Claims priority, application United Kingdom, Jun. 16, 1992, 9212768

Int. Cl.[6] H01H *15/06*

U.S. Cl. 200—541 **7 Claims**



1. An actuator assembly for an electrically operated vehicle door lock comprising:

means forming a guide for an actuator plunger;

a push-pull action actuator plunger slideably received between and located by opposing side walls of said guide for inward and outward movement between first and second positions relative to said guide;

a first electrical contact element carried by said plunger for movement therewith; and

at least one separate, second electrical contact element mounted on a said side wall of said plunger guide and so positioned relative to said first contact element as to engage said first contact element when said plunger is moved to a predetermined one of said first and second positions,

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said first contact element comprising a generally U-shaped resilient metal strip having spaced apart, parallel limbs extending along opposite side faces of the plunger and a connecting portion passing through the plunger whereby the first contact element is coupled to said plunger, an intermediate portion of each said limb being supported in spaced relation to said plunger and being deformable toward the respective plunger side face upon engagement with said second contact element.

5,586,647

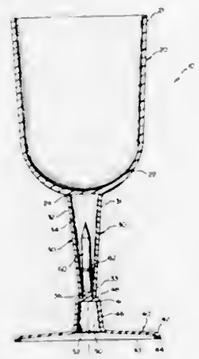
DRINKING GLASS

Patrick J. Barta, and Ann L. Porterfield, both of 7336 Earl Ave. NW., Seattle, Wash. 98117

Continuation of Ser. No. 215,029, Mar. 21, 1994, abandoned. This application Oct. 13, 1995, Ser. No. 543,147

Int. Cl.[6] B65D *77/00;25/24;* **B67B** *7/44*

U.S. Cl. 206—217 **7 Claims**



1. A drinking glass comprising:

a cup having an upper portion and a lower portion;

a stem having a top portion and a bottom portion, the top portion of the stem attached to the lower portion of the cup;

a base having a first and second ends;

means for inverting and detaching the base from the stem, associated with the base, for removably attaching the first end of the base to the bottom portion of the stem in a first position and for removably attaching the second end of the base to the bottom portion of the stem in a second inverted position;

means for securely inserting the base into a penetrable medium attached to the second end of the base wherein the means for securely inserting the base into a penetrable medium includes a spike and wherein the stem includes an upright wall surrounding a hollow interior, the spike fitting into the hollow interior of the stem when the base is in the first position.

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HINGE-LID CIGARETTE PACK MADE FROM A ONE-PIECE BLANK

Heinz Focke, Verden, and Henry Buse, Visselhövede, both of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

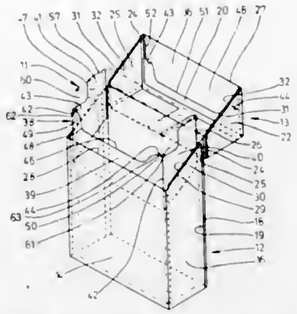
Filed Jun. 21, 1995, Ser. No. 493,279

Claims priority, application Germany, Jun. 22, 1994, 44 21 445.6

Int. Cl.[6] B65D *5/66*

U.S. Cl. 206—264 **5 Claims**

1. In a hinge-lid pack for cigarettes (**10**) that is made from a one-piece overall blank of material from which are formed a pack part (**12**), a lid (**13**) connected pivotably to said pack part (**12**), and a collar (**38**) which is anchored in the pack part (**12**) and which has a portion that projects outwardly from the pack part (**12**), the improvement wherein:



a) tile lid has an inner tab and the lid (**13**) is connected to the collar (**38**) via material webs (**43,44**) in a region of the lid inner tab (**36**) until tile hinge-lid pack is opened for the first time;

b) the lid inner tab (**36**) is connected by tile material webs (**43,44**) to an upper free edge of a collar front wall (**39**), the edge being formed by a punch line (**45**);

c) the punch line (**45**) forms transversely directed edge legs (**62, 63**) at lateral edge regions of the collar front wall (**39**), said edge legs (**62, 63**) defining lateral webs (**49, 50**) of the collar front wall (**39**);

d) the material webs (**43, 44**) are located in the edge legs (**62, 63**) and immediately adjacent to upright folding lines (**42**) between the collar front wall (**39**) and collar side tabs (**40, 41**); and

e) the collar side tabs (**40, 41**) are each provided with a recess (**60, 61**) which faces the lateral webs (**49, 50**), and which is defined by the punch line (**45**), first as an extension of the edge legs (**62, 63**) in a region adjacent to the collar side tabs (**40, 41**), and second as an upper edge (**57**), which extends parallel to the edge legs, in a region of the collar side tabs (**40, 41**) which is spaced apart from the lateral webs (**49, 50**).

5,586,649

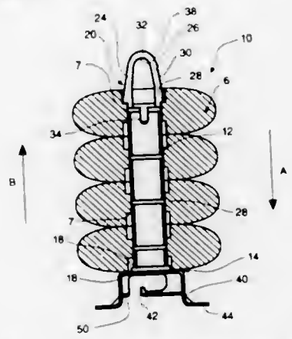
WHEEL RETAINING DEVICE

Louis Hsiao, Palo Alto, Calif., assignor to Concept Designs, Inc., Mountain View, Calif.

Filed May 18, 1995, Ser. No. 444,308

Int. Cl.[6] B65D *85/02*

U.S. Cl. 206—303 **20 Claims**



1. A package comprising a wheel retaining device and a plurality of wheels each having an aperture formed therein, said wheel retaining device comprising:

an elongate body extending through said apertures in said wheels, said elongate body having first and second ends;

a first retainer positioned proximate one of said ends of said elongate body for supporting said wheels on said elongate body,

a second retainers paced from said first retainer, said second retainer substantially resisting removal of said wheels from said elongate body over said second retainer to securely retain said wheels on said elongate body (luring handling of said wheel retaining device.

12. In combination, a wheel retaining device and a plurality of wheels each having an aperture formed therein, said wheel retaining device comprising:

an elongate body extending through said apertures in said wheels, said elongate body having opposed ends;

a retainer positioned at one of said opposed ends of said elongate body, said retainer substantially resisting removal of said wheels from said elongate body for retaining said wheels on said elongate body, said retainer being integral with said elongate body and configured to permit said wheels to slip over said retainer when said wheels are moved onto said elongate body; and

a base portion positioned at tile other of said ends, said base portion being configured for selectively supporting said elongate body on each of a plurality of different display systems.

19. A wheel retaining device for storing a plurality of replacement wheels each having an aperture formed therein, said wheel retaining device comprising:

an elongate body insertable through said apertures in said wheels, said elongate body having opposed ends;

a retainer positioned at one of said opposed ends of said elongate body for retaining said wheels on said elongate body, said retainer being integral with said elongate body and configured to permit said wheels to slip over said retainer when said wheels are moved onto said elongate body; and

a base portion positioned at the other of said ends, said base portion being configured for selectively supporting said elongate body on each of a plurality of different display systems; and

a loop positioned at one of said opposed ends, said loop being mountable to at least one of said display systems, said loop being spaced from said base portion, and

said base portion including a lower edge positionable on a support surface and a connector spaced upwardly from said lower edge, said connector being shaped to engage said loop of a second wheel retaining device to couple said second wheel retaining device to the first-mentioned wheel retaining device.

20. A wheel retaining device for storing a plurality of replacement wheels each having an aperture formed therein, said wheel retaining device comprising:

an elongate body insertable through said apertures in said wheels, said elongate body having opposed ends;

a retainer positioned at one of said opposed ends of said elongate body for retaining said wheels on said elongate body, said retainer being integral with said elongate body and configured to permit said wheels to slip over said retainer when said wheels are moved onto said elongate body; and

a base portion positioned at the other of said ends, said base portion being configured for selectively supporting said elongate, body on each of a plurality of different display systems, said base portion including at least one leg portion configured for supporting said elongate body on a horizontally extending support surface, said leg portion being further configured for mounting said elongate body to a first display system, said base portion further including a connector spaced upwardly from said leg portion, said connector being configured to mount said elongate body to a second display system different from said first display system.

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CD BANK

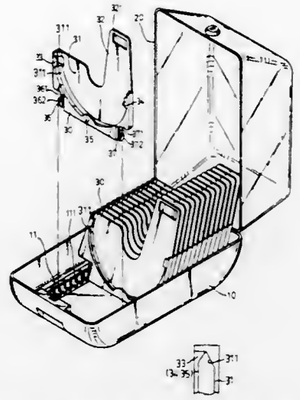
Sheng-Fu Yeh, P.O. Box 82-144, Taipei, Taiwan

Continuation-in-part of Ser. No. 632,585, Apr. 15, 1996. This application May 29, 1996, Ser. No. 654,587

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—308.1 **1 Claim**

1. A CD bank comprising a case, a transparent cover hinged to said case, and a plurality of individual CD holder plates mounted inside said case to hold individual compact disks respectively, wherein said case comprises two longitudinal rails bilaterally disposed on the inside, and longitudinally spaced pairs of transverse



grooves respectively made on said longitudinal rails; said individual CD holder plates are respectively pivotably mounted in said longitudinally spaced pairs of transverse grooves between said longitudinal rails, each individual CD holder plate comprising a top side, a bottom side, a half-round recess defined between said top side and said bottom side for holding an individual compact disk, an arched opening at the periphery of said half-round recess for the insertion of the thumb, an extension board extending from said top side at one side of said arched opening, an index groove at said extension board for mounting an index sticker, a plurality of retaining lugs suspending above said half-round recess and spaced around the border thereof for holding down an individual compact disk within said half-round recess, and two springy rods respectively raised from said bottom side at two opposite ends and pivoted to one pair of said longitudinally spaced pairs of transverse grooves, each transverse groove of said longitudinally spaced pairs of transverse grooves having an inner end terminating in a blind hole adapted to hold one springy rod of one individual CD holder plate, and a bottom side smoothly curved inwards, each of the springy rod of each of said individual CD holder plates including a suspension rod section downwardly suspended from the respective individual CD holder plate, and a pivot rod section outwardly extending from said suspension rod section and turned in the blind hole of the respective transverse groove, said half-round recess has a first beveled edge and said retaining lugs being each formed with a second beveled edge opposite to said first beveled edge thereby enabling a compact disk can be therebetween and therefore preventing said compact disk from being scratched and damaged by said CD holder plates.

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DISK HOLDER IN A CD BOX

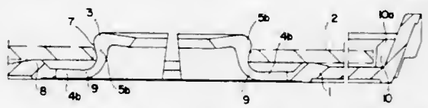
Josef Krummenacher, Muri, Switzerland, assignor to Apparate-Und Werkzeugbau AG, Muri/AG, Switzerland

Filed Jul. 13, 1995, Ser. No. 502,217

Claims priority, application Switzerland, Jul. 14, 1994, 02257/94

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—310 **4 Claims**



1. A disk holder in a CD box, comprising a ring of retaining tongues having each a radial arm followed at its inner end by a substantially axial arm which engages in the inserted disk in an elastic manner, wherein it is provided with a support outside the radial arms, respectively wherein the latter are shaped in such a manner that an inserted disk is supported at a distance above the

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radial arms, and wherein the external supporting surfaces of the axial arms are still overhanging when the disk is inserted, said radial arms having a curved portion radially extending underneath said inserted disk.

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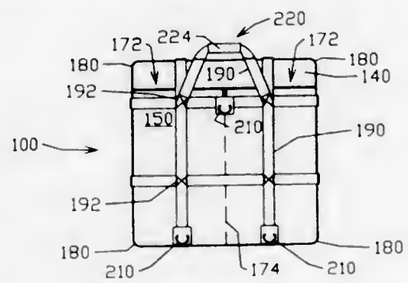
BICYCLE TORQUE COUPLING
Steve-Frank Smilanick, 318 Zola Ave., Roseville, Calif. 95678
Continuation-in-part of Ser. No. 89,108, Jul. 12, 1993, Pat. No. 5,431,507. This application Sep. 16, 1993, Ser. No. 122,368
Int. Cl.[6] B65D *85/00*
U.S. Cl. 206—335 **4 Claims**



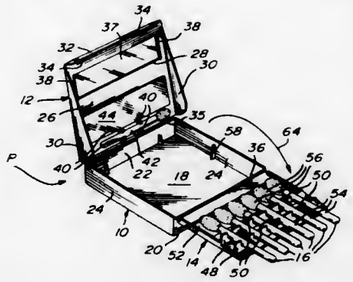
1. A case comprising, in combination:
an exterior surface formed of flexible material, said exterior surface forming a periphery of the case including peripheral side surfaces,
an interior volume dimensioned to receive a disassembled bicycle when the bicycle has handlebars, seat and two 25½ (twenty-five and one-half) inch wheels all of which are removed from its frame, and its frame is in at least two pieces, and wherein its frame is formed from a series of connected tubes having a diameter and lengths and having means to separate the tubes to form the two pieces,
wherein at least one said wheel touches an interior of each said side surface substantially at a mid point of said surfaces when the wheel is within said case,
means for distributing forces passing through said exterior surface, coupled to said exterior surface,
said exterior surface including two similarly sized square surfaces oriented in a parallel, spaced relationship with each other, each said square surface having a height and width just greater than or equal to a 25½ (twenty-five and one-half) inch diameter of the wheels of the disassembled bicycle,
wherein each said square surface of said exterior surface includes two or more pockets therein, said pockets oriented adjacent each other with a seam therebetween, said seam passing over a geometric center of said square surface, whereby a user can place items within said pockets and diminish the presentation of compressive loads at said geometric center of the square surfaces, thereby preventing axles of wheels placed within said case form receiving damaging compressive loads,
wherein said square surfaces' height or width is not greater than 26 inches,
wherein an aggregate of said height, width and a thickness between said square surfaces are dimensioned to be less than 62 (sixty-two) inches,
wherein said force distributing means is a planar layer of semi-rigid sheet material oriented adjacent an interior of said exterior surface,
wherein said case includes a plurality of detachable sleeves of flexible material, each said sleeve having a substantially rectangular shape when lying flat with a width greater than the diameter of said tubes of the bicycle, a length similar to the length of said tubes of the bicycle, and a hook and loop fastener oriented along long edges of said sleeve;
whereby said sleeve can be wrapped around said tubes of the bicycle and connect thereto within said case to further prevent a bicycle within said case from damage,
wherein a plurality of straps including tethered portions and free ends are included, said tethered portions being attached to portions of said exterior surface and said free ends including connectors at ends thereof, said free ends extending a distance from said tethered portions sufficient to completely surround said case with said connectors at said free ends coupling together,
said case including four said side surfaces which space said square surfaces away from each other, two of said side surfaces oriented vertically and two of said side surfaces oriented horizontally, and
said straps are oriented to surround the case while either surrounding said square surfaces and said vertical side surfaces or said square surfaces and said horizontal side surfaces,
said side surfaces of said exterior surface include four corners therebetween, and
wherein a zipper passes over each of said four corners and completely bisects three of said four side surfaces, whereby said case is openable and closeable for loading and unloading, and
wherein said zipper includes a beginning end and an ending end, and wherein a removable patch of material covers said ends of said zipper over two said corners of said case closest to said ends of said zipper, whereby said zipper is protected from damage.

2. A case comprising, in combination:
an exterior surface formed of flexible material, said exterior surface forming a periphery of the case,
an interior volume dimensioned to receive a disassembled bicycle when the bicycle has handlebars, seat and two 25½ (twenty-five and one-half), inch wheels all of which are removed from its frame, and its frame is in at least two pieces, and wherein its frame is formed from a series of connected tubes having a diameter and lengths and having means to separate the tubes to form the two pieces,
means for distributing forces passing through said exterior surface, coupled to said exterior surface, and
said exterior surface including two similarly sized square surfaces oriented in a parallel, spaced relationship with each other, each said square surface having a height and width greater than a 25½ (twenty-five and one-half) inch diameter of the wheels of the disassembled bicycle,
wherein each said square surface of said exterior surface includes two or more pockets therein, said pockets oriented adjacent each other with a seam therebetween, said seam passing over a geometric center of said square surface, whereby a user can place items within said pockets and diminish the presentation of compressive loads at said geometric center of the square surfaces, thereby preventing axles of wheels placed within said case form receiving damaging compressive loads,
wherein said square surfaces' height or width is not greater than 26 inches,
wherein the total of said height and width and a thickness is not greater than 62 inches,
wherein said force distributing means is a planar layer of semi-rigid sheet material oriented adjacent an interior of said exterior surface,
wherein said case includes a plurality of detachable sleeves of flexible material, each said sleeve having a substantially rectangular shape when lying flat with a width greater than the diameter of said tubes of the bicycle, a length similar to the length of said tubes of the bicycle, and a hook and loop fastener oriented along long edges of said sleeve;
whereby said sleeves are wrapped around said tubes of the bicycle and connect thereto within said case to further prevent the disassembled bicycle within said case from damage,

wherein a plurality of straps including tethered portions and free ends are included, said tethered portions being attached to portions of said exterior surface and said free ends including connectors at ends thereof, said free ends extending a distance from said tethered portions sufficient to completely surround said case with said connectors at said free ends coupling together,
said case including four side surfaces which space said square surfaces away from each other, two of said side surfaces oriented vertically and two of said side surfaces oriented horizontally,
said straps are oriented to surround the case while either surrounding said square surfaces and said vertical side surfaces or said square surfaces and said horizontal side surfaces,
wherein said side surfaces of said exterior surface include four corners therebetween, and
wherein a zipper passes over each of said four corners and completely bisects three of said four side surfaces, whereby said case is openable and closeable for loading and unloading, and
wherein said zipper includes a beginning end and an ending end, and wherein a removable patch of material covers said ends of said zipper over two said corners of said case closest to said ends of said zipper, whereby said zipper is protected from damage.

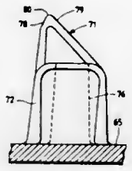
4. A case comprising, in combination:
an exterior surface formed of flexible material, said exterior surface forming a periphery of the case,
an interior volume dimensioned to receive a disassembled bicycle when the bicycle has handlebars, seat and two 25½ (twenty-five and one-half) inch wheels all of which are removed from its frame, and its frame is in at least two pieces, and wherein its frame is formed from a series of connected tubes having a diameter and lengths and having means to separate the tubes to form the two pieces,
means for distributing forces passing through said exterior surface, coupled to said exterior surface, and
said exterior surface including two similarly sized square surfaces oriented in a parallel, spaced relationship with each other, each said square surface having a height and width greater than a 25½ (twenty-five and one-half) inch diameter of the wheels of the disassembled bicycle,
said case including four side surfaces which space said square surfaces away from each other, two of said side surfaces oriented vertically and two of said side surfaces oriented horizontally,
wherein said side surfaces of said exterior surface include four corners therebetween, and
wherein a zipper passes over each of said four corners and completely bisects three of said four side surfaces, whereby said case is openable and closeable for loading and unloading, and
wherein said zipper includes a beginning end and an ending end, and wherein a removable patch of material covers said ends of said zipper over two said corners of said case closest to said ends of said zipper, whereby said zipper is protected from damage,
wherein at least one of said square surfaces includes rings attached thereto, said rings pivotable away from said square surfaces to allow access through a center of said rings,
whereby the case may be tethered to another object such as additional straps for placement and support upon a wearer, and
including thin sheets of puncture resistant material on said square surfaces,
including reinforcing straps attached to an outer surface of said case, and
including a handle coupled to said straps which are attached to said case, said handle including a wrap overlying an inner cylinder.

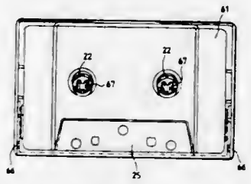
5,586,653
COSMETIC PACKAGE
Alan L. Taveroff, Dollard-des-Ormeaux, Canada, assignor to Canadian Plastics Inc., Lasalle, Canada
Continuation-in-part of Ser. No. 949,022, Sep. 21, 1992, abandoned. This application Sep. 21, 1993, Ser. No. 124,026
Int. Cl.[6] B65D *85/20;* **A45D** *40/20*
U.S. Cl. 206—362 **20 Claims**



1. A package comprising a plurality of elongated sticks, a casing comprising peripheral walls defining an open top, a closure and a tray each pivotally mounted to said casing, said tray having attachment means detachably carrying the elongated sticks on said tray and said tray being adapted for retracting, in a closed position thereof, within said casing with said closure being adapted, in a closed position thereof, for covering said open top of said casing, said tray and the elongated sticks being substantially enclosed within said casing and said closure in said closed positions, the elongated sticks being carried on an underside of said tray when said tray is in said closed position thereof such that said tray extends intermediate said elongated sticks and said closure with said elongated sticks extending in a plane substantially parallel to said underside of said tray.

5,586,654
CASSETTE ACCOMMODATING CASE
Shingo Katagiri, and Teruo Ashikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 28, 1994, Ser. No. 365,551
Claims priority, application Japan, Dec. 28, 1993, 5-74515 U; Dec. 28, 1993, 5-74516 U; Sep. 29, 1994, 6-235405
Int. Cl.[6] B65D *85/672*
U.S. Cl. 206—387.1 **16 Claims**





16. A cassette accommodating case including a cover section, the cover section comprising a cover-side opposing wall arranged

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to extend along one surface of a conventional magnetic tape cassette and a pocket capable of accommodating one end of the cassette, and a casing section which has a pair of rotation-preventing projections provided on casing-side opposing wall facing the cover-side opposing wall to retain a pair of hubs of the cassette by engaging hub pawls which protrude from an inner periphery of the hubs, the casing section being pivotally attached to the cover section so that the case can open and close, wherein each of said rotation-preventing projections comprises:

two plates which extend in parallel with each other and define an interval therebetween, the interval between said plates defining a hub-pawl retaining groove into which the hub-pawl fits, one of said two plates being longer than the other of said two plates, a width of said one of said plates along a transverse direction to a line extending between said rotation-preventing projections being less than or equal to a minimum width of a common area of opening of the hub when the cassette is loaded in both forward and backward orientations thereof at a distal position of the plate that is remote from the casing side opposing wall, the distal position being disposed in the common area, and a guiding inclined surface provided on a side edge of said one of said plates adjacent to said distal position.

5,586,655

LINE STORAGE DEVICE

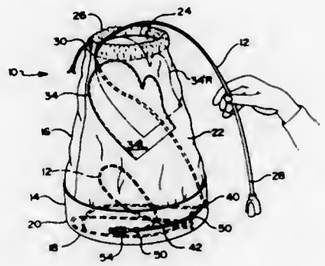
John C. McBride, Athens, Ala., assignor to Bag-It Products Corp., Nashville, Tenn.

Continuation of Ser. No. 174,045, Dec. 28, 1993, Pat. No. 5,439,109. This application Jun. 6, 1995, Ser. No. 469,487

The portion of the term of this patent subsequent to Dec. 28, 2013, has been disclaimed.

Int. Cl.[6] B65D *85/00*

U.S. Cl. 206—388 **16 Claims**



1. A line storage device comprising:

a base portion;

a body portion extending from said base portion and terminating at a first aperture, said body portion having an interior surface and an exterior surface, said base portion and said body portion operatively defining an interior of said device;

at least one hand receptacle, said hand receptacle being located on said exterior surface of said body portion;

wiping means comprising an absorbent material, said wiping means being located on said interior surface of said body portion adjacent to said hand receptacle; and

a second aperture in said base portion, said second aperture including a first opening and a second opening, said first opening being at least partially separated from said second opening, said first opening being larger than said second opening.

5,586,656

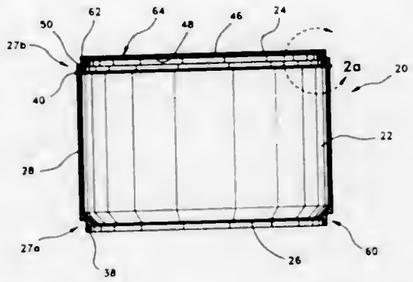
NESTABLE AND STACKABLE STORAGE UNIT

Rolin L. Abrums, 4243 White Sands Dr., Las Vegas, Nev. 89121

Filed Jan. 13, 1995, Ser. No. 372,098

Int. Cl.[6] B65D *21/036*

U.S. Cl. 206—501 **6 Claims**



1. A nestable and stackable storage unit comprising:

a container comprising a base with an upwardly extending wall having a rim extending upwardly therefrom and located inwardly thereof and a lip extending downwardly from said base and located inwardly of said wall;

a substantially planar lid, having a top surface and a bottom surface, said lid having a member extending downwardly from such lid below said bottom surface, said member including inward and outward flanges defining a first groove therebetween for engagement with said rim on said container, said member oriented on said lid such that when said first groove engages said rim, said outward flange is not located outwardly of said upwardly extending wall, a tab extending downwardly from said lid below said bottom surface, said member and tab defining a second groove therbetween for engagement with said lip on said base, said lip on said base located inwardly of said upwardly extending wall a sufficient distance such that when said second groove engages said lip, said member on said lip does not extend outwardly of said upwardly extending wall.

5,586,657

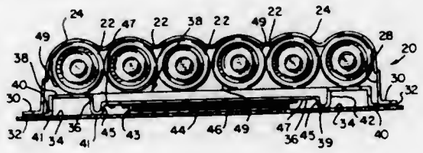
SECURITY BLISTER PACKAGE

Thomas F. Ward, Madison, and Grant W. Smith, Middleton, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Dec. 22, 1995, Ser. No. 577,504

Int. Cl.[6] B65D *85/88*

U.S. Cl. 206—705 **13 Claims**



1. A package comprising:

a) a means for holding articles, the article holding means being thermoformed of clear plastic and having a substantially planar flange and a cavity extending frontwardly from said flange;

b) a means for holding a sensor for detecting shoplifting, said sensor holding means having a first surface facing the cavity in the blister which is positioned to engage articles contained in the article holding means, and the sensor holding means further having a second surface spaced rearwardly from the first surface and a third surface intermediate between said first surface and said second surface;

c) a sensor for detecting shoplifting mounted to the third surface and thereby spaced from the articles within the package; and

d) a means for supporting the means for holding articles, said means for supporting having a card which is bonded to the flange, wherein the card engages said second surface of said sensor support.

5. A blister package comprising:

a) thermoformed plastic blister, the blister having a peripheral flange and a centrally located cavity extending frontwardly from said flange;

b) a sensor support tray, said tray having a first surface for engaging a product spaced within said blister cavity, a second surface lying substantially in the plane of the blister flange, and a third surface spaced between said first surface and said second surface;

c) an anti-shoplifting sensor connected to said third surface; and

c) a backing card which engages the blister peripheral flange and is adhesively bonded thereto, wherein the card further engages the second surface of the tray.

9. A packaged battery assembly with theft-detection features comprising:

a) a clear thermoformed plastic blister, the blister having a peripheral flange and a centrally located cavity extending frontwardly from said flange;

b) a plurality of batteries positioned in the blister cavity;

c) a card which engages with and is bonded to the blister peripheral flange;

d) a thermoformed plastic sensor support tray, said tray having a first surface which engages the batteries and positions the batteries within the blister cavity, and a second surface defined by a peripheral flange and a raised rib, the second surface lying substantially in the plane of the flange of the blister and engaging the card, and a third surface which extends from the rib and is spaced from the first surface by the rib, wherein the third surface is spaced between the second surface and the first surface, the third surface facing toward the card; and

e) an electronic article surveillance sensor adhesively bonded to the third surface to be thereby spaced from the batteries.

12. A method of manufacturing a blister package containing a sensor for detecting shoplifting, the method comprising the steps of:

a) positioning a thermoformed blister, having a cavity and a peripheral flange surrounding the cavity, for receiving at least one article for packaging within the cavity;

b) loading the at least one article wholly within the cavity formed in the blister so as to leave a gap of about one tenth inch between the article and a plane defined by the peripheral flange;

c) picking-and-placing a tray containing a sensor for detecting shoplifting in the blister cavity so the tray does not extend above the plane defined by the peripheral flange; and

d) positioning a backing card over the flange, and bonding the card to the flange to seal the package.

5,586,658

WAFER CUSHIONS FOR WAFER SHIPPER

David L. Nyseth, Plymouth, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Jun. 6, 1995, Ser. No. 471,641

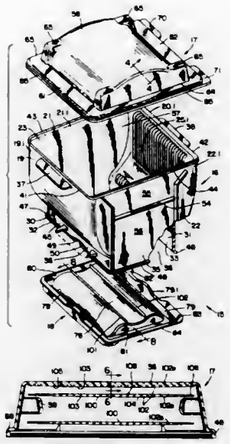
Int. Cl.[6] B65D *85/30*

U.S. Cl. 206—711 **20 Claims**

1. A device for storing and shipping semiconductor wafers and disks comprising:

(a) a container having side, end and bottom walls, an open top and an elongate removable cover to provide access into the interior chamber wherein such wafers are received and stored, the container having wafer separating means maintaining the wafers in a spaced and confronting relationship to each other and transversely oriented of the side walls, the cover having a latching means to secure the cover to the container thereby to confine and protect the wafers; and

(b) a plurality of rows of resiliently flexible tabs on the cover, the rows extending along the cover and spaced from each other, each row having two end portions and a middle portion, the tabs being generally rectangular and having a wafer engaging edge portions, each row having an outer edge defined by the wafer engaging edge portions of adjacent tabs, the tabs having a length extending along the row and a width transverse the length, the wafer engaging edge portion being spaced from the cover to engage and cushion the wafers, a slot separating adjacent tabs, each tab positioned along the row to engage a single wafer with a corresponding tab in each other row and apply a retaining force, the width of the tabs progressively increasing from the end portions of each row to the middle portion of the row to thereby cushion the wafers in the container and balance the retaining force across each of the wafers while accommodating bowing or flexing of the cover.



5,586,659

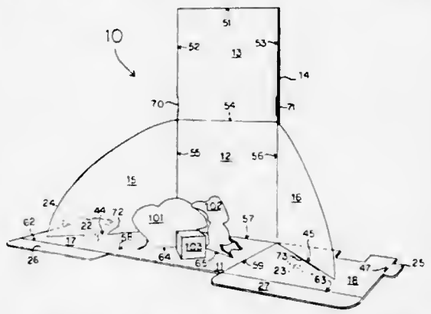
COMBINATION GIFT BOX AND GREETING CARD

Timothy F. Trumbo, Box 657, Sun Valley, Id. 83353

Filed Jun. 5, 1995, Ser. No. 475,456

Int. Cl.[6] B65D *5/42*

U.S. Cl. 206—768 **8 Claims**



1. A combined greeting card and gift box formed by preselectively stamping and cutting a single sheet blank to form a plurality of interconnected panels having tabs and tab inserts, the interconnected panels being arranged so that each panel is hingedly con-

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nected to at least one other panel along a fold line wherein the combined greeting card and gift box may be arranged in one of a first gift box configuration and a second greeting card configuration by folding the interconnected panels along the fold lines interconnecting the panels and inserting the tabs into corresponding tab inserts, wherein the first gift box configuration comprises:

a lower back panel;

a center base panel perpendicular to the lower back panel;

a first side panel perpendicular to the lower back panel;

a second side panel perpendicular to the lower back panel and parallel with the first side panel;

an upper back panel perpendicular to the lower back panel and parallel with the center base panel;

a first base panel perpendicular to the center base panel;

a second base panel perpendicular to the center base panel and parallel with the first base panel; and

a top panel perpendicular to the upper back panel and parallel with the lower back panel; and

wherein the second greeting card configuration comprises:

the center base panel perpendicular to the lower back panel;

the upper back panel extending from the lower back panel and coplanar with the lower back panel;

the first base panel extending from the center base panel and coplanar with the center base panel;

the second base panel extending from the center base panel and coplanar with the center base panel;

the first side panel perpendicular to and engaging via a tab and tab insert, the first base panel, for supporting the lower back panel in a vertical plane;

the second side panel perpendicular to and engaging via a tab and tab insert, the second base panel, for supporting the lower back panel in a vertical plane; and

the top panel folded backwards so that the top panel lies flat against the back of the upper back panel.

5,586,660

PROCESS AND APPARATUS FOR SCREENING A STREAM OF BULK MATERIAL

Adolf Buchfink, Rosengarten, Germany, assignor to Claudius Peters Aktiengesellschaft, Buxtehude, Germany

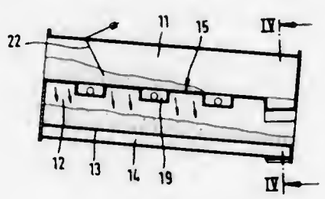
PCT No. PCT/EP94/01504, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/26428, PCT Pub. Date Nov. 24, 1994

PCT Filed May 10, 1994, Ser. No. 360,794

Claims priority, application Germany, May 10, 1993, 9307072 U

Int. Cl.[6] B03B *1/00*

U.S. Cl. 209—3 **11 Claims**



1. An apparatus for screening a stream of bulk material comprising a screening zone defining at least a portion of a conveying path for said stream of material, said screening zone comprising at least one fluidized-bed segment and an adjacent screening segment arranged successively within the conveying path, said fluidized-bed segment being effective to impart to the bulk material free-flowing, fluid-like behavior characteristics of a fluidized bed for conveyance in fluidized form along said path toward said adjacent screening segment.

5,586,661

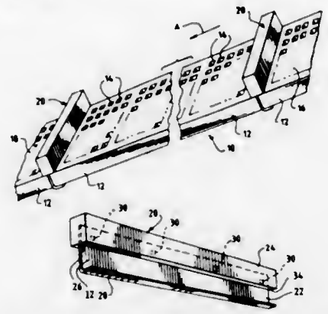
DAM MEMBER FOR A SCREEN DECK

Roger M. Maki, Hibbing, Minn., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 15, 1994, Ser. No. 357,911

Int. Cl.[6] B07B *1/49*

U.S. Cl. 209—397 **9 Claims**



1. A one-piece dam member for a screen deck having at least two adjacent panels, each panel having a top surface, a bottom surface and an adjoining side surface, said top surface being coplanar the dam member comprising:

a wall member formed from a material having a substantially high resistance to abrasion mountable on the top surface of at least one of the adjacent panels; and

a bracket member having an L-shape cross-sectional configuration defined by a first leg and a second leg, the first leg having an upper portion opposite the second leg, and a lower portion, the upper portion of the first leg secured to the wall member to form a one-piece dam member,

wherein the lower portion of the first leg of the bracket member is retained in releasable engagement between the adjoining side surfaces of the adjacent panels, and the second leg of the bracket member extends along the bottom most surface of one of the panels, and

wherein the dam member is readily placed in desired positions about the screen deck.

5,586,662

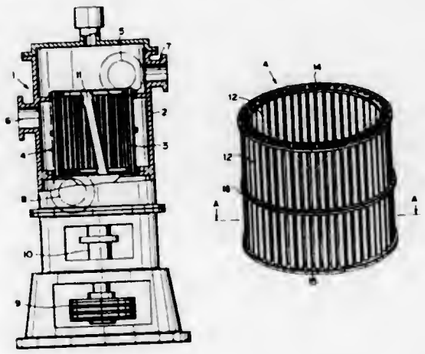
BASKET FOR A PAPER-MAKING SCREEN AND METHOD FOR PRODUCING SAME

Yoshihiko Aikawa, Shizuoka, Japan, assignor to Aikawa Iron Works Co., Ltd., Shizuoka, Japan

Filed Apr. 28, 1995, Ser. No. 431,317

Int. Cl.[6] B07B *1/49*

U.S. Cl. 209—411 **4 Claims**



1. A basket for a paper-making screen consisting essentially of:

a plurality of rod-shape members, each having a circular cross section;

a first annular supporting member having a plurality of first receiving portions arranged annularly in predetermined constant intervals, each first receiving portion being formed of a circular hole slightly larger than a diameter of the rod-shape member and located in a center of the first annular supporting member in a direction of the width; and

a second annular supporting member having a plurality of second receiving portions arranged annularly in constant intervals as in the first receiving portions, each second receiving portion being formed of a circular hole having a size as in the first receiving portion and located in a center of the second annular supporting member in a direction of the width, longitudinal end portions of said rod-shape members being located in the circular holes of the first and second annular supporting members and fixed thereto so that a space between the rod-shape members includes wide entrance and exit portions, and a narrow middle portion to thereby select paper materials through the spaces, said first and second annular supporting members having same widths and being connected only to the rod-shape members.

5,586,663

PROCESSING FOR THE OPTICAL SORTING OF BULK MATERIAL

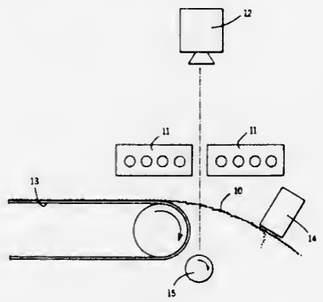
Wolfgang Graudejus, Haselau; Eberhard Briem, Pinneberg; Wilhelm Haettich, Karlsruhe, and Heribert Geisselmann, Stutensee, all of Germany, assignors to H.F. & Ph.F. Reemtsma GmbH & Co., Hamburg, Germany

Filed Dec. 28, 1994, Ser. No. 365,489

Claims priority, application Germany, Dec. 28, 1993, 43 45 106.3

Int. Cl.[6] B07C *5/342;* **G01J** *3/46*

U.S. Cl. 209—582 **10 Claims**



1. A process for the optical sorting of an examination material comprising a bulk material, comprising:

conveying the examination material over a transport belt and moving it past an observation head with a light source and a product signal receiver arranged in the vicinity of the light source;

measuring light reflected back from the examination material by means of detection elements lying next to one another along a line on the receiver, the detection elements measuring an image wherein each image point is broken down into one of several color components by color filters;

sorting the bulk material from reject parts on the basis of color values given by the intensities measured in the color components for each image point by

analyzing color values of the examination material in several selected sub-regions of a color space established by the color components;

ascertaining by a classifier, for each sub-region, connected areas of image points with color values falling into the respective sub-region; and

carrying out a sorting classification according to preset criteria applied to the geometry and the size of these ascertained connected areas in the image of the examination material;

wherein through comparison of color signals of adjacent image points, large gradients are determined and generally disrupted color values resulting from such gradients are not taken into account during the color value measurements.

5,586,664

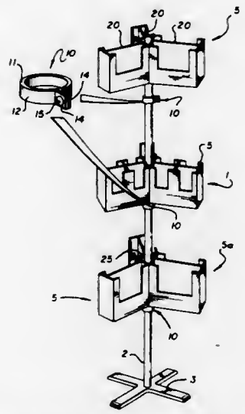
DISPLAY ARRANGEMENT

Stephen D. Taylor, P.O. Box 669, Neutral Bay Junction 2089, Australia

Filed Jun. 2, 1994, Ser. No. 253,007

Int. Cl.[6] A47F *5/05*

U.S. Cl. 211—58 **11 Claims**



1. A display arrangement including an elongate and substantially vertical shaft, extending upwardly from a base; at least two article receiving and holding modules being provided and so formed and adapted as to be mounted to said shaft, so that three article receiving and holding arms extend substantially radially outwardly from said shaft, each of said article receiving and holding arms having at least three substantially vertical walls adapted for containing articles in substantially vertical orientation, an inner end wall, an outer end wall and a back wall, wherein the inner end walls of the three article receiving and holding arms abut one another in a triangular relationship about the vertical shaft; each of said modules being independently rotatable about and relative to said shaft.

5,586,665

GRAVITY FED BOTTLE DISPENSING AND DISPLAY RACK

Claude Brousseau, Iles Perreault, Canada, assignor to Etalex Inc., Montreal, Canada

Filed Mar. 1, 1995, Ser. No. 396,712

Int. Cl.[6] A47F *1/04;7/28*

U.S. Cl. 211—59.2 **9 Claims**

1. A gravity fed bottle dispensing and display rack comprising a support frame having front and rear transverse horizontal rigid members, a straight bottle support channel interconnected between said transverse horizontal rigid members and oriented downwardly from a rear end thereof to a front open end, said support channel having a longitudinal slot defined longitudinally thereof in a lower

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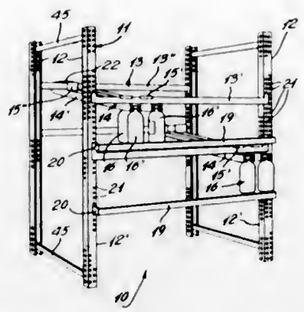
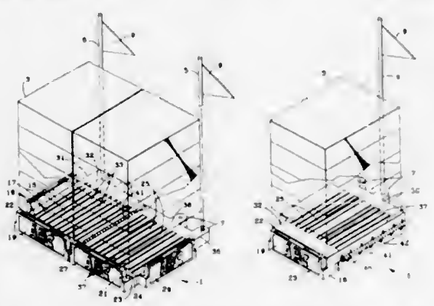


end and extends between opposed support flanges, said support channel having a dispensing front section adjacent said front open end, said dispensing front section of said support channel extending in a substantially horizontal plane, with the remaining section being inclined upwardly towards, said rear end, attachment means for securing said support channel to said front and rear transverse horizontal rigid members, said attachment means being clampingly and displaceably connected to said front and rear transverse horizontal rigid members to position said support channel at a desired lateral spacing in said support frame to accommodate bottles of different diameters, said attachment means comprises a rear clamp secured to a rear end of said bottle support channel and said rear transverse horizontal rigid member for maintaining said rear end of said support channel elevated from said dispensing front section, and a front clamp to said front section of said bottle support channel and secured said front transverse horizontal rigid member, arresting means adapted to abuttingly engage a forwardmost bottle suspended by a neck thereof by said support channel at said dispensing front section to arrest said forwardmost bottle at said front open end of said support channel, and abutment means secured inwardly of said support channel in said dispensing front section at a predetermined location to releasably engage an upper end of said forwardmost bottle.

5,586,666
FOLDABLE AND EXPANDABLE PROMOTIONAL PALLET
Anthony C. Squitieri, Monroe, Conn., assignor to Mechtronics Corporation, Stamford, Conn.
Filed Jun. 12, 1995, Ser. No. 489,441
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—175 **20 Claims**



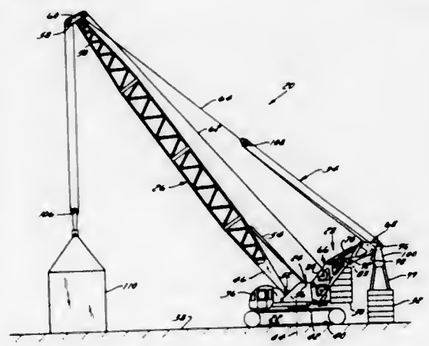
1. A pallet which is adjustable in both length and width, said pallet including

left front, right front, left rear, and right rear base members, each said base member having an end piece with parallel fingers extending therefrom,

said fingers on said left front and said left rear base members being interengaged with one another, said fingers on said right front and said right rear base members being interengaged with one another, and

said left rear and said right rear base members being hinged together, said hinging being on a hinge axis, whereby said base members can hingedly fold over one another.

5,586,667
MOBILE CRANE WITH MAIN AND AUXILIARY COUNTERWEIGHT ASSEMBLIES
Camile J. Landry, 12636 Bristol Ave., Baton Rouge, La. 70815
Filed Dec. 14, 1995, Ser. No. 572,086
Int. Cl.[6] B66C *23/76*
U.S. Cl. 212—196 **21 Claims**



1. A crane comprising:

(A) a ground-supported base;

(B) a platform supported on said base;

(C) an elongated boom having a lower end pivotally mounted on said platform and having an upper end, said boom being confined to swing relative to said platform substantially in a vertical plane; and

(D) an elongated spar which is substantially shorter than said boom, said spar including

(1) a lower spar body having i) a lower, from end which is mounted on said platform and which is spaced rearwardly from said lower end of said boom, and ii) an upper, rear end and

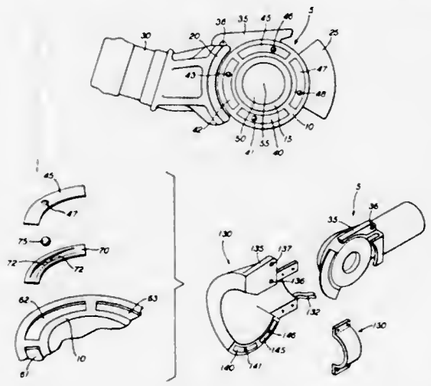
(2) an upper rigid spar tip formed from a plurality of members immovably attached to one another, said spar tip having a lower end connected to said upper end of said spar body by a) a pivot pin pivotably coupling said spar tip directly to said spar body and b) a lost motion connection, said lost motion connection being pivotably coupled to said spar body and also being pivotably coupled to said spar tip at a location above and behind said pivot pin, said lost motion connection being axially compressible, said pivot pin and said lost motion connection operating to render said spar tip capable of limited pivotal motion with respect to said spar body through a range having upper and lower limits;

(E) a main counterweight assembly suspended from said spar body;

(F) an auxiliary counterweight assembly connected to said spar tip so as to be supported on the ground when said spar tip is in its lower limit of pivotal motion but otherwise to be suspended from said spar tip; and

(G) a link connecting said spar tip to said upper end of said boom, wherein said spar tip, said lost motion connection, said pivot pin, said link, and said boom interact with one another such that, when said boom deflects forwardly and downwardly upon imposition of a load thereon, said boom deflection is resisted by said auxiliary counterweight assembly but not by said main conterweight assembly until said spar tip reaches an upper limit of pivotal motion, after which further boom deflection is resisted by both said auxiliary counterweight assembly and said main counterweight assembly.

5,586,668
IMBEDDED ELECTRICAL CONNECTOR
Craig A. Miller, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Dec. 14, 1994, Ser. No. 355,839
Int. Cl.[6] B61G *5/00*
U.S. Cl. 213—1.3 **25 Claims**



1. A connector for joining a fluid pressure communication conduit and at least one electrical conduction line on a first railway vehicle to a like connector on a second railway vehicle coupled to such first railway vehicle, said connector comprising:

(a) a connector body including;

(I) a surface for mating two like connectors, said surface having a fluid pressure port, said fluid pressure port having a center, and compressible sealing means surrounding said fluid pressure port;

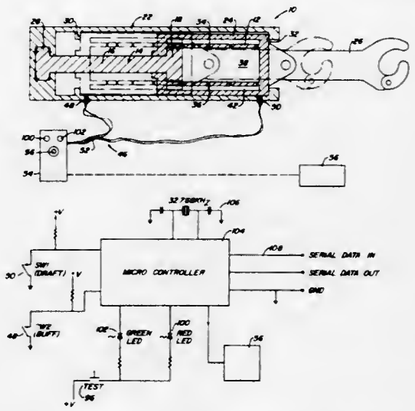
(II) a nipple for attachment of a fluid pressure hose, said connector body having formed therein a fluid pressure communication passage joining said nipple to said fluid pressure port;

(III) means for mechanically joining two connectors disposed with their said mating surfaces in contact wherein force is applied across their said mating surfaces so said sealing means are compressed and a fluid seal is provided;

(b) at least one electrical contact on said mating surface, said at least one electrical contact including a button with resilient mounting means and a plate having an arcuate contact surface electrically connected to said button so that when a first connector is joined to a second connector, said button with resilient mounting means on said first connector makes an electrical interconnection with said arcuate contact surface on said second connector, and said button with resilient mounting means on said second connector makes an electrical interconnection with said arcuate contact surface on said first connector, through which redundant electrical interconnection is provided between said at least one electrical contact on said first connector and said at least one electrical contact on said second connector; and

(c) means for connecting at least one electrical conduction line to said at least one electrical contact.

5,586,669
CUSHIONING UNIT FAULT DETECTOR
O. Elwyn Seay, Fort Worth; Stephen K. Nickles, and John E. Haley, both of Burleson, all of Tex., assignors to FM Industries, Inc., Fort Worth, Tex.
Filed May 3, 1995, Ser. No. 433,725
Int. Cl.[6] B61G *7/00*
U.S. Cl. 213—43 **20 Claims**



11. In a railcar cushioning device for absorbing shock between railway cars, the cushioning device having a hydraulic cylinder containing hydraulic fluid and a piston which locates within the cylinder, the piston and cylinder being movable relative to the other between an extended position and a contracted position in response to draft and buff forces, the improvement comprising:

a draft sensor and a buff sensor mounted to the cushioning device, each sensor producing a first initiation signal in response to movement of the piston and cylinder substantially from the extended position to the contracted position, and each sensor producing a second initiation signal in response to movement of the piston and cylinder substantially from the contracted position to the extended position; and

detection means which measures a first selected time period initiated in response to the first initiation signal from the draft sensor, the detection means detecting a first error each time the first initiation signal from the buff sensor is generated within the first selected time period, the detection means measuring a second selected time period initiated in response to the second initiation signal from the buff sensor, the detection means detecting a second error when the second initiation signal from the draft sensor is generated within the second selected time period.

5,586,670
BOTTLE SECURITY SYSTEM
Kenneth Greenwald, 135 Ocean Pkwy., Brooklyn, N.Y. 11218
Division of Ser. No. 290,164, Aug. 15, 1994, Pat. No. 5,464,109. This application Nov. 6, 1995, Ser. No. 554,582
Int. Cl.[6] B65D *55/14*
U.S. Cl. 215—207 **5 Claims**

1. A device to prevent the unauthorized removal of a closure from the mouth of a bottle having an annular ring about its neck, said annular ring having a first face adjacent the mouth of the bottle and a second face spaced apart from said first face comprising:

a) a cap member having an interior cavity extending from an open first end to a closed second end;

b) said cap member having a cylindrical exterior wall and a generally cylindrical interior wall, said interior wall having an inwardly tapered portion adjacent said open first end;

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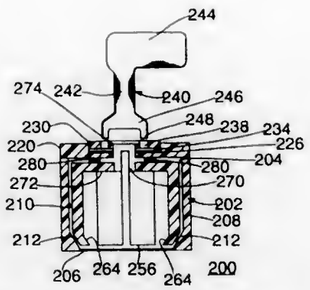


c) bottle grip means arranged to fit within said interior cavity of said cap member and move with respect to said cap member;

d) said bottle grip means having a circular base member and a plurality of resilient fingers extending from the periphery of said base member and perpendicular thereto, the free ends of said fingers describing a circle;

e) each of said fingers having an inwardly tapered portion, said inwardly tapered portion having an exterior and an interior surface;

f) said exterior surface of said fingers engaging the inwardly tapered portion adjacent said open first end of said cap member whereby the diameter of the circle described by said interior surface is dependent upon the relative position of said exterior surface of said fingers with respect to said inwardly tapered portion adjacent said open first end of said cap member so that said diameter can be adjusted to engage to disengage the ring of the bottle.

5,586,671

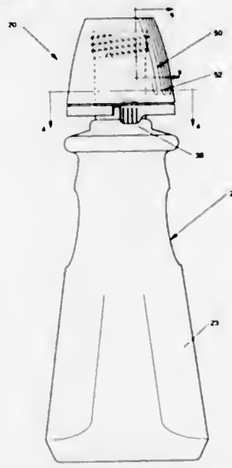
CHILD RESISTANT PACKAGE

Hewin N. Thomas; Jack E. Haney, both of Norcross, Ga., and Peter W. Hamilton, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 382,736, Feb. 2, 1995, abandoned, which is a continuation-in-part of Ser. No. 103,476, Aug. 6, 1993, abandooed. This application Feb. 23, 1996, Ser. No. 602,877

Int. Cl.[6] B65D *50/08*

U.S. Cl. 215—209 **19 Claims**



1. A child-resistant package for storing and dispensing material, comprising:

(a) a bottle including a base and a finish portion, said finish portion having an innermost surface and an outermost surface, said finish portion including a first means for rotatably and releasably securing a closure to said finish portion on at least one of its surfaces, a platform extending radially outward from said finish portion, said platform having an outermost surface being generally concentrically aligned with said finish portion, and at least one resiliently deformable pushtab having a first end and a second end, at least one of said ends being secured to said platform, each of said at least one pushtab having an uppermost surface, a lowermost surface, an innermost surface, and an outermost surface, said outermost surface of said pushtab being generally concentrically aligned with said finish portion and generally conforming to the contour of said exterior surface of the adjacent portions of said platform to minimize the chance of inadvertent depression thereof when said platform is grasped, said at least one pushtab having a vertical extension projecting above said uppermost surface of said at least one pushtab, said at least one pushtab being inwardly moveable relative to the rest of said platform when a force is applied to said outermost surface of said at least one pushtab;

(b) a closure having a skin, said skirt having an innermost surface and an outermost surface, said skirt including on at least one of its surfaces second means complementary to said first means for rotatably and releasably securing said closure to said finish portion, said skirt having at least one interlocking pawl on its innermost surface wherein each of said at least one interlocking pawl corresponds to only one of said vertical extension, said at least one interlocking pawl being shaped and positioned to deflect said corresponding vertical extension on said at least one resiliently deformable pushtab when said closure is rotatably secured onto said finish portion in a latched position and releasing said closure from said finish portion by rotating said closure in a reverse direction when said at least one resiliency deformable pushtab is first depressed to disengage said at least one pushtab's vertical extension from said interlocking pawl; and

(c) a seal on said innermost surface of said closure for providing sealing engagement between said closure and said finish portion of said bottle at least when said at least one interlocking pawl engages said corresponding vertical extension in said latched position, said seal being configured so as to be biased against said finish portion so that after said cap is rotatably secured onto said finish portion, said cap can be rotated in a reverse direction, to a point at which said at least one interlocking pawl and said at least one pushtab come into contact, without breaking said sealing engagement between said seal and said finish portion.

5,586,672

TUBE MADE OF PLASTICS MATERIAL HAVING A TEARABLE CAP, SAID TUBE WITH A COVER

Bernard Schneider, and René Hoslet, both of Sainte Menehould, France, assignors to Cebal, S.A., Clichy, France

Continuation of Ser. No. 79,675, Jun. 18, 1993, abandoned. This application Aug. 17, 1995, Ser. No. 516,249

Claims priority, application France, Jun. 19, 1992, 92 07839

Int. Cl.[6] B65D *47/10*

U.S. Cl. 215—250 **23 Claims**

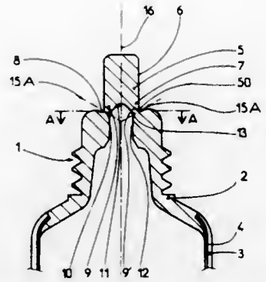
1. A tube (1) made of plastics material having

a longitudinal axis (16),

a head (2) which has a cylindrical axial internal surface (12), the head being sealed by an integral cap (5) which is connected to the head and adapted to be torn therefrom by twisting to leave an orifice in the head, the cap (5) having

a base (7) where the cap (5) is connected to the head (2),

an exterior lateral surface (6) of convex planar polygonal contour extending down to the base (7),



an internal surface (11) adjoining the cylindrical axial internal surface (12), and being a surface of revolution about the axis and in the form of an arch which extends up into the cap, and

a tear zone (10) contained between and defined by the cap convex planar polygonal exterior lateral surface (6), the cap internal surface (11) and the head internal surface (12),

the external lateral surface (6) and the internal surface (11) at the connection between the base of the cap and the head providing the tear zone with successive gradually thinning and thickening thin and thick portions (e.g. 14, 14' and 9, 9') extending about the axis (16).

5,586,673

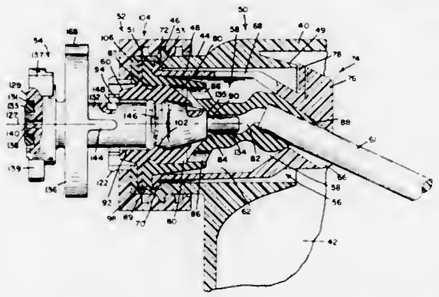
CAP ASSEMBLY FOR FLUID DELIVERY SYSTEM

Ronald J. Venooker, Franklin; John A. Scavitto, Mendon; Peter N. Karkantis, Acton; David T. Healey, No. Reading, and Richard L. Travers, Scituate, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Division of Ser. No. 165,137, Dec. 9, 1993, abandoned. This application Aug. 11, 1995, Ser. No. 513,699

Int. Cl.[6] B65D *51/00*

U.S. Cl. 215—310 **4 Claims**



1. A cap assembly for receiving a stopper and for application to a bottle having a cylindrical neck portion which has a central longitudinal axis, external threads and a circular end edge which defines an opening to the bottle, said cap assembly comprising:

(a) a cap which has an axis of rotation, an end wall and a circular side wall, said end wall having a first central circular aperture which is concentric with said axis of rotation, said circular side wall having internal threads which are complementary with the external threads of the neck portion of a bottle for screwing the cap onto said neck portion about said axis of rotation, said end wall having an outer surface and an inner surface; and

(b) a removable thrust washer which is adapted to lie within the circular side wall of said cap, said thrust washer comprising:

(1) a base wall which is adapted to lie against the inner surface of said end wall, said base wall having a second central circular aperture which is concentric with the central circular aperture of said cap and said axis of rotation;

(2) an annular side wall which extends transversely from said base wall, said annular side wall being concentric with said axis of rotation and having an outer end which extends through said first central circular aperture to the outer surface of said end wall when said base wall lies against said end wall within the annular side wall of said cap, said annular side wall being resiliently yieldable toward said axis of rotation; and

(3) a ridge at the outer end of said annular side wall, said ridge extending away from said axis of rotation for engaging the outer surface of said end wall when said base wall engages the inner surface of said end wall to secure said thrust washer against movement away from said cap while allowing said thrust washer to rotate freely within said cap about said axis of rotation, said flange moving out of contact with the outer surface of said end wall upon bending of said annular side wall toward said axis of rotation in response to pressure against said end wall toward said axis of rotation for releasing said thrust washer from said cap.

5,586,674

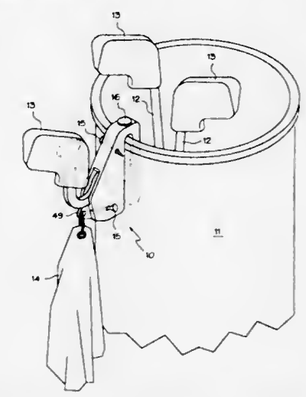
GOLF CLUB COVER HOLDING DEVICE FOR ATTACHMENT TO A GOLF BAG

Armand E. Nachbauer, 811 Bolivar St., Lady Lake, Fla. 32159

Filed Dec. 13, 1995, Ser. No. 571,473

Int. Cl.[6] A63B *55/00*

U.S. Cl. 206—315.4 **14 Claims**



1. A golf club cover device for semi-permanent attachment to a golf bag for holding a club head cover in a prominent manner, said golf club cover device comprising:

(a) a receiving member for hooking engagement with the golf bag, said receiving member having a main body and a hooking leg extending therefrom, wherein the main body has a front wall, a back wall, a substantially vertical first sidewall and a generally vertical second sidewall with a passageway extending therethrough such that an entry opening of the passageway is in the substantially vertical first sidewall adjacent said hooking leg and an exit opening of the passageway is in the generally vertical second side wall, further wherein the hooking leg extends substantially parallel to the substantially vertical first sidewall so as to create an open channel therebetween sufficiently wide to allow said receiving member to fit onto an open-top edge of the golf bag; and

(b) an L-shaped meshing member positioned in the receiving member, said L-shaped meshing member having a substantially vertical leg and a substantially horizontal leg whereby the substantially vertical leg has a generally rounded knob to receive the club head cover and the substantially horizontal

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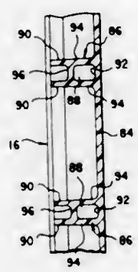
leg has an enlarged terminus with a protuberance dimensioned to be received within the passageway of the receiving member but not pass completely therethrough with the protuberance extending past the entry opening of said passageway such that the enlarged terminus is seated in the passageway in a manner which allows the L-shaped member meshing to be rocked from a non-locking position to a locking position by contact of the protuberance with the golf bag so as to hold the golf club cover device to the golf bag.

5,586,675

REINFORCED MATERIAL HANDLING CONTAINER

Antonius H. Borsboom; Anthony A. Gennari, both of Pittsfield; Kenneth G. Rudolph, Dalton, and Peter J. Zuber, Pittsfield, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 29, 1993, Ser. No. 159,095
Int. Cl.[6] B65D *88/52*
U.S. Cl. 220—6 **5 Claims**



1. A material handling container (**10**) of the type for packing, shipping and inventorying goods and of the type for stacking one upon the other when not in use, said container (**10**) comprising:

a molded thermoplastic container (**10**) defining at least one planer expanse (**84**) and having a plurality of plastic reinforcement members (**86**) integrally molded with the container (**10**) at predetermined positions on said plastic planer expanses (**84**) of said container (**10**);

said plurality of reinforcement members (**86**) defining a plurality of hollow channels (**88**) disposed adjacent to said planer expanse (**84**) and including at least one rib (**90**) extending outwardly from said channel (**88**) defined by said member (**86**) for adding strength to said planer expanse (**84**) of said container (**10**).

5,586,676

BEVERAGE CONTAINER CAP WITH STIRRER

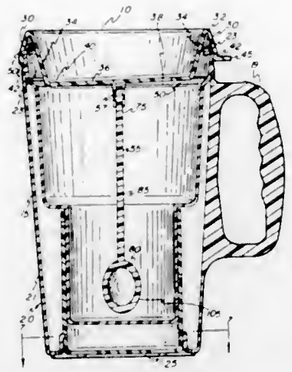
L. Grant Lynd, Canal Winchester, Ohio, assignor to National Packaging Corporation, Columbus, Ohio

Filed Oct. 20, 1995, Ser. No. 546,337
Int. Cl.[6] B65D *41/56*
U.S. Cl. 220—212 **16 Claims**

1. A drink container cap, said cap comprising

an exterior surface, and

an interior surface, said interior surface having a stirrer depending downwardly therefrom, said stirrer having a shank end, said cap having formed therein a stirrer receptacle having an inner surface, said stirrer being mechanically retained within



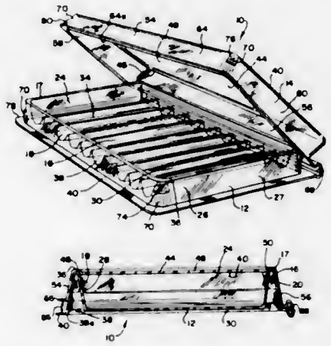
said stirrer receptacle by cooperation between said shank end and said inner surface, said stirrer receptacle having a bottom edge, said stirrer receptacle having at least one notch formed in said bottom edge, said stirrer having at least one projection extending outwardly therefrom, said projection configured to fit within said notch.

5,586,677

THERMOFORMED FOLDOVER PACKAGE WITH EASY OPEN FEATURE

Douglas E. Foos, Barrington Hills, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Sep. 30, 1994, Ser. No. 316,240
Int. Cl.[6] B65D *43/26*
U.S. Cl. 220—260 **5 Claims**



1. A container comprising:

a base having an upper rim defining a top opening and a sidewall forming at least a portion of said rim, said base including a first flange extending outward from said sidewall along one length of the sidewall and a second flange extending outward from said sidewall along a second length of the sidewall;

a cover hingeably connected to said base, said cover including a peripheral portion and a skirt connected to said peripheral portion, said cover being shaped and dimensioned to cover

and close said top opening of said base with said skirt extending generally along the exterior of said sidewall, said cover including a third flange extending outward from said skirt along a first length of said skirt and a fourth flange extending outward from said skirt along a second length of said skirt;

a hinge integrally and pivotally connecting said second flange to said fourth flange; and

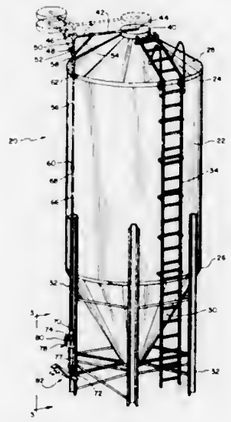
means for releasably holding said cover in position upon said base when said cover is closed over said top opening, said skirt and said sidewall being sized so that said first flange is vertically spaced from said third flange and said second flange extends abuttingly adjacent said fourth flange when said cover is closed so each of said first and said third flanges may be individually grasped to open said container.

5,586,678

BULK HOPPER TANK LID OPENER ASSEMBLY

Hans J. Rosch, Aurora, and Steven R. Beck, Central City, both of Nebr., assignors to TIC United Corp., Dallas, Tex.

Filed Nov. 4, 1994, Ser. No. 334,529
Int. Cl.[6] B65D *43/26*
U.S. Cl. 220—263 **15 Claims**



1. A bulk hopper tank assembly comprising:

a bulk hopper tank having a top end and a bottom end, the bulk hopper tank containing an opening at the top end thereof, the bulk hopper tank having an exterior side;

a lid assembly, the lid assembly including:

a lid, a generally vertical arm extending along the exterior side of the bulk hopper tank, the vertical arm having opposite top and bottom ends, a generally horizontal arm having opposite ends wherein one end thereof being attached to the lid and the other end thereof being connected to the top end of the vertical arm,

a lifter attached to the bottom end of the vertical arm, the lifter moveable between a down position and an up position,

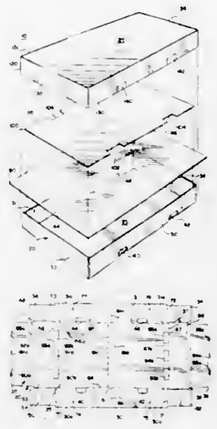
a handle being connected to the vertical arm near the bottom end thereof, when the lifter is in the up position the handle being moveable to a plurality of positions between a first position in which the lid is over the opening and a second position in which the lid is away from the opening so as to not cover any of the opening.

5,586,679

DISPOSABLE BODY CONTAINER

Betty M. Thomas, Joliet, Ill., assignor to Group-J, Inc., Evergreen Park, Ill.

Filed Aug. 16, 1993, Ser. No. 106,648
Int. Cl.[6] B65D *5/36;5/60;* **A61G** *17/00*
U.S. Cl. 220—410 **20 Claims**



1. A collapsible, disposable body container, comprising:

a container base moveable along a plurality of fold lines between an open position defining a container, and a collapsed position defining a generally planar configuration; and

a container lid sized to cover said container base;

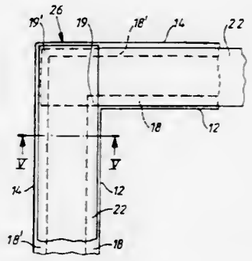
said container base including a double center fold line for folding said container base in half longitudinally in said collapsed position.

5,586,680

BOX CONSTITUTING VACUUM INSULATED WALLS OF A REFRIGERATOR OR FREEZER CABINET

Fredrik Dellby, Enskede, and Per Åke Fonser, Stockholm, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation of Ser. No. 346,751, Nov. 30, 1994, abandoned. This application Nov. 9, 1995, Ser. No. 556,126
Claims priority, application Sweden, Dec. 22, 1993, 9304248
Int. Cl.[6] B65D *25/00*
U.S. Cl. 220—467 **8 Claims**



1. A box forming heat insulating walls of a refrigerator or freezer cabinet, said walls comprising an inner metal shell, an outer metal

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shell, and an evacuated heat insulation between the shells, said shells having edges which surround a rectangular access opening to the box and which are gas imperviously connected to each other by a thin metal strip having poor heat conductivity, wherein the edges are folded toward each other so that said edges form planar surfaces located in substantially one and the same plane as said access opening, said planar surfaces surrounding said rectangular access opening in said substantially one and the same plane, and wherein the strip is generally flat and soldered to the planar surfaces.

5,586,681

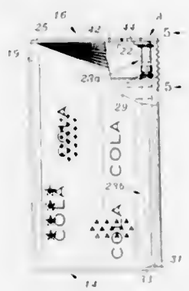
CONTAINER FOR DISPENSING LIQUIDS

Nini E. Pollcappelli, 361 N. Robertson Blvd., Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 29,791, Mar. 11, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,461

Int. Cl.[6] B65D *25/28*

U.S. Cl. 220—674 **10 Claims**



1. A container for a fluid, comprising:

an elongated generally cylindrical body portion having first and second ends;

a bottom portion sealing the first end;

a substantially planar top portion sealing the second end and having an aperture;

a cover member releasably secured to the top portion for sealing the aperture, wherein the cover member provides a closed cavity suitable for containing a fluid without fluid communication therethrough;

the body portion having disposed thereon and embossed therein a pattern of protrusions of a preselected shape, height, configuration and arrangement, the protrusions enhancing the exterior periphery of the body portion by providing traction thereto whereby the container can be more securely held when the container becomes wet or cold, the protrusions extending outwardly to increase the volume of container relative to the same container without embossing and to substantially decrease the area of contact with the hand of a user holding the container such that there is less temperature conduction between the hand and the fluid in the container and,

the body including an outside surface, and including a printed layer of an ornamental representation on the outside surface, the ornamental representation acting to enhance the ornamental effect of the surface, and the ornamental representation including in at least some part printed lettering, and at least some part of the ornamental representation extending over the protrusions.

5,586,682

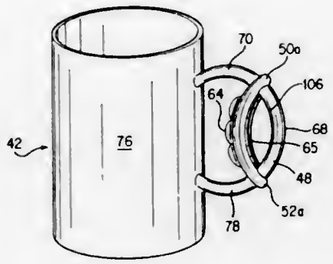
HANDLE GRIP PIECE FOR USE IN GRIPPING A DRINKING MUG

Frank Yeh, 1019 N. Mayflower St., Anaheim, Calif. 92801

Filed Oct. 23, 1995, Ser. No. 547,108

Int. Cl.[6] B65D *25/28*

U.S. Cl. 220—755 **11 Claims**



1. A combination comprising:

a) a mug having a wall and a handle, the handle having a top portion connected to the wall, a bottom portion connected to the wall, and a central portion connected to the top and bottom portions, the top, central and bottom portions of the handle together with the wall defining a space between the handle and the wall; and

b) a handle grip piece comprising:

(i) a first side piece comprising an inner edge and an outer surface facing the wall of the mug, the first side piece comprising an upper recess and a lower recess spaced-apart from each other along the inner edge;

(ii) a second side piece comprising an inner edge and an outer surface facing the wall of the mug, the second side piece comprising an upper recess and a lower recess spaced-apart from each other along the inner edge; and

(iii) means positioned along the inner edges of the first and second side pieces for connecting the first side piece to the second side piece;

c) wherein the first and second side pieces are positioned substantially inside the space between the handle and the mug, the upper and lower recesses of the first and second side pieces retain and connect portions of the handle, and the handle is exposed and is not encapsulated by the first and second side pieces except by the upper and lower recesses of the first and second side pieces, when the first and second pieces are positioned inside the space between the handle and the mug.

5,586,683

STORAGE DEVICE FOR UMBRELLA SACKS

Toshiyuki Murakami, Kanagawa, Japan, assignor to Kabushiki Kaisha Muraharu Seisakusho, Sagamihara; Nilkura Scales Co., Ltd., and Kabushiki Kaisha Yakult Honsha, both of Tokyo, all of Japan

PCT No. PCT/JP93/01852, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO95/01281, PCT Pub. Date Jan. 12, 1995

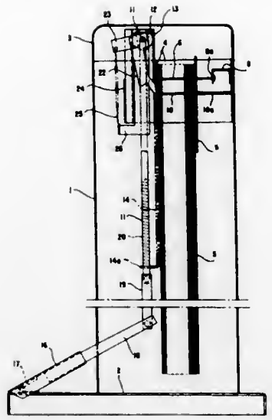
PCT Filed Dec. 22, 1993, Ser. No. 256,423

Claims priority, application Japan, Jun. 30, 1993, 5-041131 U; Nov. 26, 1993, 5-321070; Nov. 26, 1993, 5-321071

Int. Cl.[6] B65H *1/00*

U.S. Cl. 221—33 **5 Claims**

1. A storage device for umbrella sacks comprising: a device body having a plurality of storage sacks for umbrellas stored



therein; a movable support member in said device body vertically movable therein; a foot pedal for moving said movable support member lower in said device body; open control levers for opening said storage sacks in connection with the descending motion of said movable support member.

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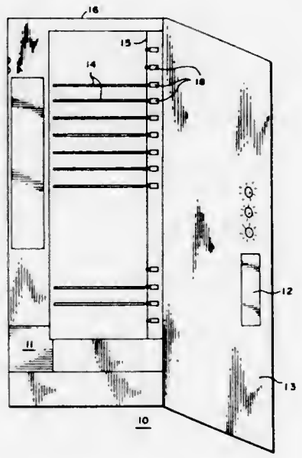
VENDING APPARATUS AND METHOD HAVING IMPROVED RELIABILITY

James H. Halsey, El Dorado, Ark.; Scott Juds, Everett, Wash., and James W. Erwin, El Dorado, Ark., assignors to IDX, Inc., El Dorado, Ark.

Filed May 2, 1994, Ser. No. 235,893

Int. Cl.[6] G07F *11/06*

U.S. Cl. 221—90 **7 Claims**



1. A vending apparatus comprising:

a plurality of shelves, each shelf being positionable in a nondispensing position and in a dispersed position;

a plurality of solenoids, each solenoid being positioned and arranged to support one of the plurality of shelves in the nondispensing position;

control circuit means operably coupled to the plurality of solenoids for selectively enabling any one of the plurality of solenoids thereby causing an associated shelf to move from the nondispensing position to the dispensed position; and

test circuit means operably coupled to the plurality of solenoids and to the plurality of shelves for determining when any one particular solenoid and the shelf that is associated with that particular solenoid are in electrical contact with one another, thereby indicating that the shelf that is associated with the particular solenoid is in the nondispensing position.

5,586,685

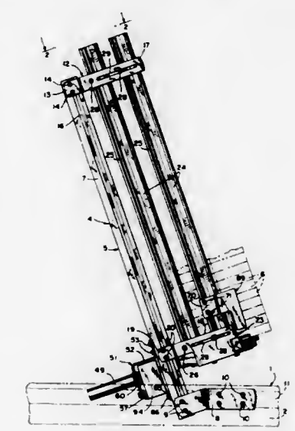
APPARATUS FOR DISPENSING ARTICLES

Wolfgang C. Dorner; Michael A. Hosch, both of Oconomowoc; Darin L. Danelski, Dousman, and David A. Remsing, Sussex, all of Wis., assignors to Dorner Mfg. Corp., Hartland, Wis.

Filed Sep. 27, 1994, Ser. No. 313,016

Int. Cl.[6] B65H *1/00*

U.S. Cl. 221—197 **16 Claims**



9. In combination, a conveyor including a conveyor frame and a conveyor member mounted for travel on the frame in a given direction, a dispenser disposed above the conveyor member for individually dispensing articles onto the conveyor member, said dispenser including an elongated supporting structure for supporting a stack of superimposed articles, said supporting structure having a longitudinal axis disposed at an acute angle with respect to the vertical, said supporting structure including a generally L-shaped base to support a lowermost article in the stack, said L-shaped base having a pair of legs disposed at an angle to each other, a peripheral portion of the lowermost article being supported on said legs, pusher means including a pusher mounted for sliding movement relative to the base and disposed to engage the lowermost article and push the lowermost article from the stack and deposit said article on the conveyor member, and stripper means mounted on the supporting structure and disposed to be engaged by a second lowermost article in the stack to prevent movement of the second lowermost article from the stack as the lowermost article is pushed from the stack.

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5,586,686

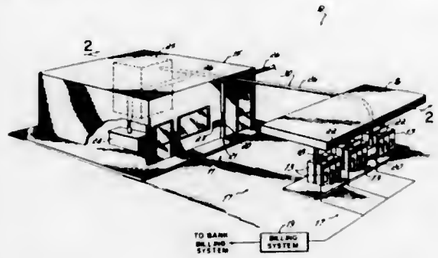
TEMPERATURE MAINTAINED FOOD DISPENSING SYSTEM AND METHOD

Rafael T. Bustos, Alpharetta, Ga., and George LaPolice, Somerville, N.J., assignors to L&P Property Management Company, Chicago, Ill.

Continuation-in-part of Ser. No. 404,243, Mar. 15, 1995, abandoned. This application May 25, 1995, Ser. No. 449,935

Int. Cl.[6] B23Q *7/04*

U.S. Cl. 221—211 **26 Claims**



1. A system for vending individually packaged food products in their individual non-reusable packaging containers to customers at a customer location in an ambient temperature environment, for immediate consumption at a food service temperature that differs from the temperature of the ambient temperature environment, comprising:

a customer terminal at the customer location in an ambient temperature in the ambient temperature environment having an order entry device operable to generate an order command in response to order input from a customer and a packaged product dispensing unit operable to present a food product in its own individual non-reusable packaging container to the customer;

a food product supply terminal at a loading location that is physically separated from the customer location by an intervening building structure or partition or an otherwise useful space that is part of neither the customer terminal nor the supply terminal, the loading station including a food product supply enclosure having an environment therein maintained the food service temperature;

a pneumatic conveyor extending between the food product supply terminal and the product dispensing unit operable, when activated, to move an individually packaged food product in its packaging container from the supply terminal, across the intervening structure or space, between the two locations, to the dispensing unit; and

a controller operable to activate the conveyor, in response to an order command from the order entry device, the controller being logically linked to a payment device that accepts payment for the product or charges payment therefor to the customer.

5,586,687

GRAVITY FEED BOTTLE DISPENSING DEVICE HAVING A TRACK-BLOCKING GATE MECHANISM

William S. Spamer, Roswell; J. Marshall Suttles, Elberton; Dennis E. Parham, and James D. Whiten, both of Kennesaw, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 16, 1995, Ser. No. 389,379

Int. Cl.[6] B65G *60/00*

U.S. Cl. 221—298 **23 Claims**

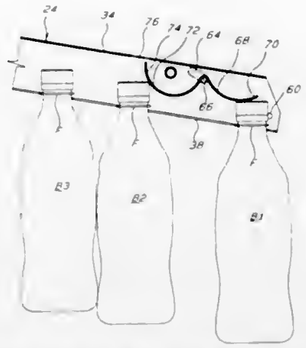
1. A merchandising device for bottles each having an integrally formed annular neck flange, comprising:

track means having a front end and a rear end and defining a pathway therealong to support a row of said bottles such that said bottles are suspended by said neck flanges thereof for movement along said pathway and are removable from said pathway through said front end;

support means for supporting said track means such that said track means is inclined downwardly toward said front end whereby said bottles when supported by said track means are allowed to gravity feed toward said front end as a leading bottle in said row is removed from said pathway;

stopper means provided at said front end for engagement with said leading bottle so as to prevent said leading bottle from being accidentally removed through said front end whereby said leading bottle when arriving at said front end is stopped and presented for removal from said pathway; and

gate means for blocking said pathway at a position between said front and rear ends when said leading bottle is engaged by said stopper means such that forward movement of the other bottles in said row is blocked by said gate means whereby said leading bottle is maintained free of pressure of said other bottles and disposed substantially vertical when stopped at and suspended from said front end.



5,586,688

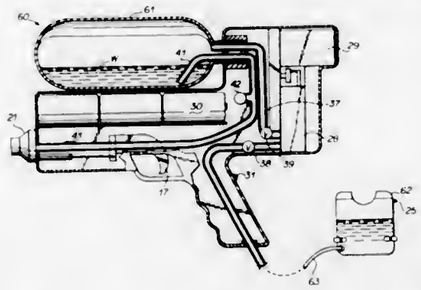
ELECTRIC PUMP TOY WATER GUN

Lonnie G. Johnson, Smyrna, and John Applewhite, Atlanta, both of Ga., assignors to Johnson Research & Development Company, Inc., Smyrna, Ga.

Filed Nov. 25, 1994, Ser. No. 344,875

Int. Cl.[6] A63H *3/18*

U.S. Cl. 222—61 **13 Claims**



1. A portable water gun comprising a housing defining a barrel, a handle and a trigger; a storage reservoir adapted to hold liquid; a pressure tank adapted to hold liquid; a pump for drawing liquid from said storage reservoir and depositing the drawn liquid into said pressure tank; an electric motor coupled with said pump, an electric power supply electrically coupled with said electric motor; conduit means for conveying liquid from said pressure tank to ambience adjacent an end of said barrel; and control means coupled to said trigger for controlling the flow of liquid through said conduit means upon actuation of said trigger.

5,586,689

SQUEEZABLE RECEPTACLE HAVING A CUT-OUT PORTION IN AN END SECTION THEREOF

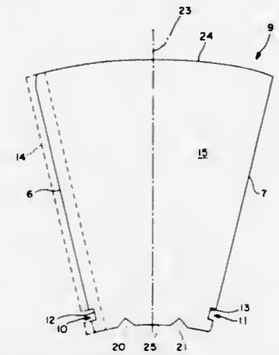
Antonio D'Amato, Arzano, Italy, assignor to Seda S.p.A., Napoli, Italy

Filed Apr. 7, 1995, Ser. No. 418,427

Claims priority, application European Pat. Off., Apr. 12, 1994, 94105630

Int. Cl.[6] B65D *35/00*

U.S. Cl. 222—92 **15 Claims**



1. A squeezable receptacle, comprising:

a body, the body having a receptacle opening and a wall, the body tapering downward from the receptacle opening, the wall being defined by a circumferential surface held together in an overlapping area extending along a left-hand side edge and a right-hand side edge, said circumferential surface having at a lower end thereof a flattened end section, a cut-out portion being provided in the end section, the cut-out portion extending in from at least one of the left-hand side edge and the right-hand side edge, said cut-out portion being open towards a respective other edge and being arranged, at least partially, in the overlapping area.

5,586,690

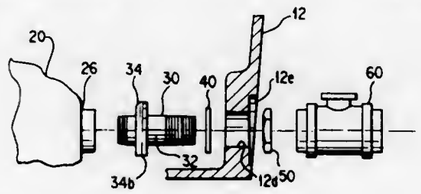
BULK CONTAINER WITH REMOVABLE LINER, DISCHARGE FITMENT FOR THE LINER, AND ADAPTER FOR CONNECTION TO DISCHARGE PORT OF THE CONTAINER

Steven P. Ettore; Joseph J. Lane, both of Marietta, and Douglas S. Vandergriff, Woodstock, all of Ga., assignors to 21st Century Containers, Ltd., Atlanta, Ga.

Filed Sep. 19, 1994, Ser. No. 305,939

Int. Cl.[6] B65D *35/56*

U.S. Cl. 222—105 **11 Claims**



1. A lined container comprising:

a rigid-walled vessel having a wall and a port formed in said wall;

a flexible liner having a discharge fitment integrally provided therewith, said fitment having female threads;

an adapter comprising a tubular member having a proximal end, a distal end, and a coaxial bore, for connecting said fitment of said flexible liner to said port of said vessel, and a flange member, secured to said tubular member, for abutting against an interior surface of the wall of said vessel, wherein the distal end of said adapter extends through the port of said rigid-walled vessel.

5,586,691

COMBINATION DISPENSE TAP AND CUSTOMER INFORMATION DISPLAY

Henry E. Gotch, Sunbury-on-Thames, and Roger J. Hyde, Little Harrowden, both of England, assignors to Alumasc Limited, Kettering, England

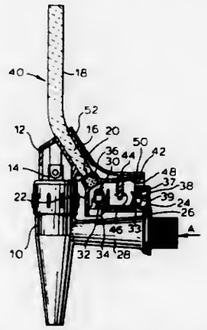
PCT No. PCT/GB93/01701, § 371 Date Apr. 17, 1995, § 102(e) Date Apr. 17, 1995, PCT Pub. No. WO94/04456, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 11, 1993, Ser. No. 381,953

Claims priority, application United Kingdom, Aug. 14, 1992, 9217293; Oct. 15, 1992, 9221677

Int. Cl.[6] B65D *5/66*

U.S. Cl. 222—113 **12 Claims**



1. In combination customer information display apparatus and a dispense tap, for beverages and other fluids, and having a tap body, for attachment to a counter fitting, and an operating lever assembly with an illuminated tap handle, connected to a tap opening and closing mechanism in the tap body, wherein:

the operating lever assembly includes

a tap handle formed at least in part of light transparent and/or light reflective material and

a tap handle holder connected to the tap opening and closing mechanism; and

the display apparatus includes

a light generator mounted externally to the tap handle, and

means to direct light from the light generator into or onto the tap handle;

whereby, in use, the tap handle can be illuminated to display customer information.

5,586,692

WATER BOTTLE ASSIST DEVICE

Rodney C. Livengood, P.O. Box 744, Kittanning, Pa. 16201

Filed Mar. 13, 1995, Ser. No. 402,642

Int. Cl.[6] B67D *5/64*

U.S. Cl. 222—166 **4 Claims**

1. For a drinking water dispenser of the type utilizing an inverted water bottle removably mounted on the upper end of the

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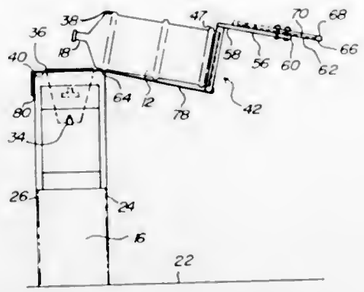


dispenser, an assist device for inverting the water bottle from an upright position to an inverted, dispensing position on the dispenser, comprising:

a base member having a recess into which a water bottle is temporarily set in an upright position;

an elongated support member for positioning the base member in a horizontal disposition against the dispenser;

retention means for maintaining the assist device and the water bottle in close proximity to the dispenser as the assist device inverts the water bottle from the upright position to the inverted, dispensing position;

an extension member attached to the support member and capable of selective linear adjustment relative to the support member in order to maintain the horizontal disposition of the support member relative to a floor surface;

the extension member further comprising a sliding sur-surface contiguous with the support member and which slidably contacts the support member during selective linear adjustment of the extension member; a flat elongated facing surface opposite the sliding surface;

the flat elongated facing surface further including an elongated groove;

an attachment means for securing the retention means to the dispenser; and

the attachment means including a pair of attachment strips for securement to the dispenser in a spaced-apart relationship to that the retention means can be secured to each respective attachment strip.

5,586,693

LIQUID DISPENSER COMPRISING A DISPENSING VALVE AND A PUSH BUTTON

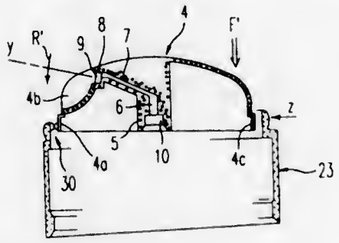
Vincent De Laforcade, Rambouillet, France, assignor to L'Oreal, Paris, France

Filed Jun. 8, 1995, Ser. No. 488,738

Claims priority, application France, Jun. 8, 1994, 94 07018

Int. Cl.[6] B67D *5/06*

U.S. Cl. 222—182 **16 Claims**



1. A dispenser for dispensing of a product in the form of a liquid, a spray or a foam, the dispenser comprising:

a reservoir for the product, the reservoir having a first axis of symmetry and being provided with a dispensing valve, the dispensing valve comprising an actuator stem;

a push button having a pin which is capable of acting on the stem, a duct passing through the pin and connecting one end of the stem to a nozzle provided with a second axis, and arranged in the push button; and

a retaining ring capable of being fixed on the reservoir for keeping the push button in position;

wherein:

the push button and the retaining ring are made in one piece and articulated to each other by a swivel joint connecting the push button to the ring in a zone situated in a plane defined by the first axis of the reservoir and the second axis of the nozzle, the swivel joint being capable of pivoting round a third axis perpendicular to the first axis, and the push button and the ring being connected to each other by at least one tab movable in translation along the first axis.

5,586,694

PERFUME APPLICATOR WITH REPLACEABLE CARTRIDGES

Diane Breidenbach, and Laurence Mille, both of Smithtown, N.Y., assignors to Fragrance Systems International, Inc., Smithtown, N.Y.

Continuation-in-part of Ser. No. 356,918, Dec. 14, 1994, Pat. No. 5,526,960. This application Feb. 24, 1995, Ser. No. 394,031

Int. Cl.[6] B67D *5/06*

U.S. Cl. 222—183 **10 Claims**

1. A liquid perfume product dispenser assembly comprising, in combination:

a cylindrical container having an open base end and an open outlet end,

a removable and replaceable liquid reservoir cartridge within said cylindrical container;

said reservoir cartridge having an open discharge end extending beyond the outlet end of said cylindrical container and a closed end extending beyond the open base end of said cylindrical container;

dispensing means removably mounted in the open discharge end of said reservoir cartridge for dispensing the contents of said cartridge and to permit the replacement of said cartridge and transfer of said dispensing means to a replacement cartridge; and

cover means for enclosing the open discharge end of said cartridge and said dispensing means to form a continuous cylindrical configuration with said cylindrical container.

5,586,695

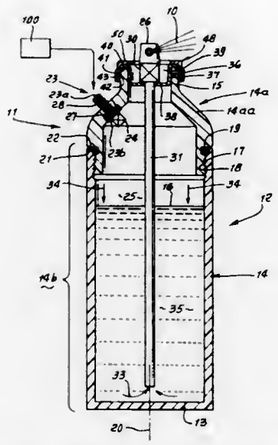
SPRAYED LIQUID DISPENSING APPARATUS

Rainer H. Labus, 811 E. Grinnell Dr., Burbank, Calif. 91501, and Stephen L. Tucker, 227 Poinsettia, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 13,959, Oct. 7, 1993, Pat. No. Des. 357,177. This application Mar. 6, 1995, Ser. No. 398,971

Int. Cl.[6] B65D *83/14*

U.S. Cl. 222—396 **9 Claims**



1. Sprayed liquid dispensing apparatus comprising:

a) a container consisting of high-strength synthetic resin, the container having a bottom wall, an upright side wall, and an upper neck,

b) said side wall including upper and lower wall portions having threaded interconnection, whereby the upper wall portion is rotatably removable from the lower wall portion to allow liquid to be filled into the lower portion, after which the upper portion is rotatably connectible to the lower portion to provide a sealed interconnection therewith,

c) a pressurized gas inlet fitting carried by said upper wall portion proximate said neck, the fitting including a check valve, whereby pressurized gas can be filled into the container, for pressurizing the liquid therein,

d) and a manually manipulable discharge valve carried proximate the top of the container, above said neck and via which sprayed liquid is dispensed,

e) said side wall and bottom wall having sufficient thickness as to be rigid and to contain fluid pressure up to at least about 200 psi.

5,586,696

HAIR GROWING MANNEQUIN HEAD

Evelyn R. Martinez, 1053 S. White Rd., San Jose, Calif. 95127

Filed Jan. 17, 1995, Ser. No. 375,372

Int. Cl.[6] D06C *15/00;* **A63H** *3/44;* **G09B** *19/10;* **A41G** *3/00*

U.S. Cl. 223—66 **6 Claims**

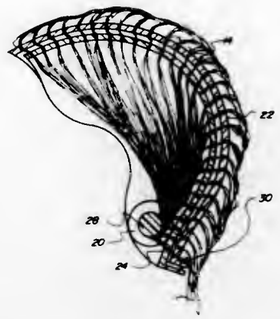
1. A hair growing mannequin head comprising:

a mannequin head portion; and,

a hair supply means removably mounted to an upper portion of the mannequin head portion for selectively dispensing hair proximal to the upper portion of the mannequin head portion,

wherein the hair supply means is in the form of a replaceable cartridge assembly which can be selectively separated from the mannequin head portion for replacement,

wherein the hair supply means comprises a perforated helmet assembly which can be positioned into fitting engagement with the mannequin head portion to form a representation of a human head structure; a supply reel rotatably mounted within the helmet assembly; a plurality of strands of hair stored on the reel for dispensing through perforations in the helmet assembly.



5,586,697

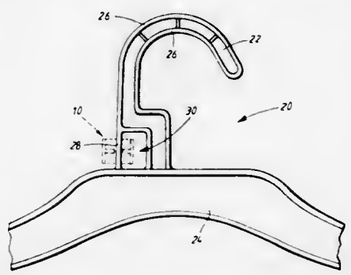
GARMENT HANGER

Gert A. Johansson, Hammarsbacke 36, S-443 38 Lerum, Sweden

Filed Jun. 8, 1995, Ser. No. 488,745

Int. Cl.[6] A47G *25/14;* **G09F** *19/00*

U.S. Cl. 223—85 **16 Claims**



9. A one-piece garment hanger assembly comprising:

a hanger body;

a hook member formed integrally with said hanger body;

an elongate member partially delimiting an opening which is defined between a portion of said hook member and said elongate member; and

a substantially cylindrical information marker attached to and rotatable about said elongate member within said opening, said marker comprising a cylindrical ring wall and a slot through said ring wall which said elongate member passes to attach said marker to said elongate member.

5,586,698

AUTOMOTIVE TOOL STORAGE DEVICE

Hideto Satoh, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Japan

Filed May 19, 1995, Ser. No. 444,442

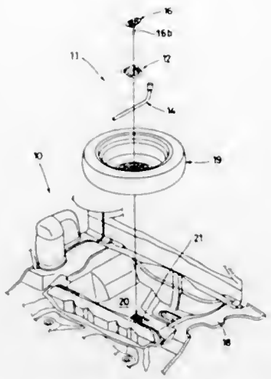
Claims priority, application Japan, May 30, 1994, 6-116131

Int. Cl.[6] B62D *43/00*

U.S. Cl. 224—42.24 **3 Claims**

1. An automotive tool storage device for use with a spare tire having a wheel hub fixable to an automobile rear floor, said storage device comprising:

VOL 1193 ISS 4 DEC 24 1996 UMI



a spare tire holder having a threaded portion in connection therewith and adapted to project downwardly through the wheel hub and toward the automobile rear floor and a spare tire bracket adapted to be connected with the automobile rear floor for connection with the threaded portion for fixing the spare tire to the rear floor;

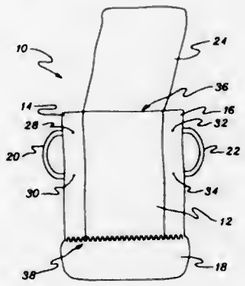
a tool; and

a tool holder disposed below the spare tire holder and adapted to be disposed above the wheel hub, said tool holder having a hole formed therein permitting said threaded portion of said spare tire holder to be inserted therethrough, said tool holder further comprising a concave portion formed therewith and opening downwardly toward the wheel hub, wherein, in use, said threaded portion of said spare tire holder is inserted through said hole of said tool holder, said tool is situated in said concave portion of said tool holder and said threaded portion is fixed to said spare tire bracket such that said tool is adapted to bear against the wheel hub and said tool is clamped inside said concave portion between said tool holder and the wheel hub.

5,586,699
BACKPACK SUPPORT
Kurt W. Heisler, McDonough, and Richard S. Haddock, Endwell, both of N.Y., assignors to Johnson Worldwide Associates, Inc., Sturtevant, Wis.
Continuation of Ser. No. 195,707, Feb. 14, 1994, abandoned. This application Feb. 6, 1996, Ser. No. 597,347
Int. Cl.[6] A45F *3/04;3/08*
U.S. Cl. 224—628 **9 Claims**

1. In a rectangular frame for supporting a backpack having a pair of shoulder straps and a rigid frame having cylindrical upper and lower cross members, the improvement comprising a pair of rigid vertical fittings for securing the shoulder straps to the frame, each of said fittings including a main section having a series of parallel slots, means at each end of said main section for securing said fittings in a perpendicular spaced relation to said upper and lower cylindrical cross members, said securing means comprising a curved member on one end of each of said fittings having a curvature slightly greater than half the curvature of the upper cross member, the curved member being sufficiently flexible to form a snap fit with said upper cross member, and a flat slotted ring mounted on each shoulder strap, said ring being of a size to pass through said slots and being rotatable with respect to the shoulder straps to lock each strap in one of the slots in said fittings.

5,586,700
MAIL CARRIER
John E. Fitzner, 1006 Floral Ave., Schenectady, N.Y. 12306, and Thomas J. McCoy, 4 St. Marie St., Schenectady, N.Y. 12303
Filed Nov. 8, 1994, Ser. No. 336,258
Int. Cl.[6] A45C *13/26*
U.S. Cl. 224—219 **14 Claims**



1. A mail carrier for assisting a mailperson with carrying mail, comprising:

a flat back portion having a top edge and two side edges, wherein said flat back portion is vertically stiff;

a pair of stiff side flaps, each stiff side flap being moveable along a vertical axis and connected to a respective one of said two side edges;

an open pouch connected to said flat back portion at a lower half thereof, wherein an upper half of said flat back portion extends above said open pouch; and

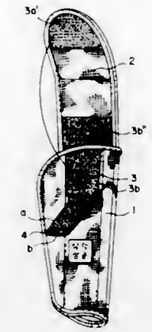
a pair of handles, each handle being connected to a respective one of said pair of stiff side flaps, wherein said pair of handles allow said mail carrier to be suspended along the length of said mailperson's forearm.

5,586,701
HANDGUN HOLSTER
Kwon K. Kim, Seoul, Rep. of Korea, assignor to Samduck Sanggong Co., Ltd., Seoul, Rep. of Korea
Filed Sep. 29, 1995, Ser. No. 536,208
Claims priority, application Rep. of Korea, May 4, 1995, 9576
Int. Cl.[6] F41C *33/02*
U.S. Cl. 224—243 **5 Claims**

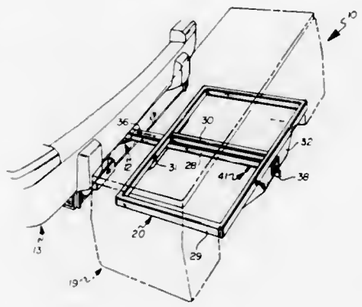
1. A handgun holster having a flap that may be arranged in a plurality of fastening positions, said handgun holster comprising:

a holster body (1), said holster body (1) having an inside surface and an outside surface, said outside surface of said holster body having a loop fastening part (3*b*) formed thereon, said outside surface of said holster body having a subordinate fastening piece (4) secured thereto, said subordinate fastening piece (4) having a hook fastening part (a) and a loop fastening part (b) formed on opposite sides thereof; and

a holster flap (2), said holster flap (2) having a beginning portion and an ending portion, said beginning portion of said holster flap being secured to said holster body (1), said holster flap (2) having an inside surface and an outside surface corresponding to said inside surface and said outside surface of said holster body (1), said inside surface of said ending portion of said holster flap having a hook fastening part (3*a'*) formed thereon, said outside surface of said ending portion of said holster flap having a loop fastening part (3*b'*) formed thereon, said inside surface of said beginning portion of said holster flap having a loop fastening part (3*b"*) formed thereon.



5,586,702
VEHICLE CARGO CARRIER
William R. Sadler, 1520 Edgewood Dr., Altoona, Wis. 54720
Filed Apr. 12, 1995, Ser. No. 421,049
Int. Cl.[6] B60R *7/00;7/10;9/00;11/00*
U.S. Cl. 224—521 **17 Claims**



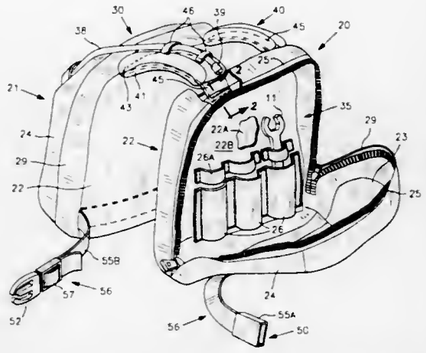
1. A cargo carrier for attachment to the rear portion of a vehicle via a receiver-type trailer hitch of the type having a substantially square tubular configuration with an open central channel, comprising:

(a) a connection member for attachment to the vehicle trailer hitch, said connection member having a predetermined configuration, said connection member having a bar structure which is horizontally pivotal, said bar structure being of a predetermined length and having predetermined outside dimensions which are substantially equivalent to inside dimensions of the trailer hitch central channel, said connection member further having a proximal end for insertion into vehicle trailer hitch central channel and an opposing distal end;

(b) a frame member slidably attached to said connection member; and

(c) a box member attached to said frame member.

5,586,703
DUAL FIELD PACK
Elizabeth Radar, and James R. Radar, both of 1215 Red Gum, Suite H, Anaheim, Calif. 92806
Filed May 26, 1995, Ser. No. 451,858
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—601 **17 Claims**



1. A double pack device worn by a person for carrying items, the device comprising:

a front pack and an interconnected back pack, each of the packs having an outer shell of flexible non-self-supporting material comprising a proximal shell wall contacting the body of the person and a distal shell wall, the shell walls spaced apart and connected by a peripheral wall, the outer shell defining at least one interior space for removably containing and carrying items therein, wherein the peripheral wall has a separable enclosing means accessing the at least one interior space;

a shoulder strap means securely interconnected with the enclosing means of the back pack and the front pack, and an adjustable side strap means, both Strap means interconnecting the two packs, wherein the strap means are fabricated of a flexible material having a higher tensile strength relative to the material of the outer shell; whereby the shoulder strap means is supported by the shoulders of the person thereby positioning the front pack in contact with a front of the person and the back pack in contact with a back of the person and the side strap means, and a strap length adjustment means, configured for drawing the proximal shell walls into firm contact with the body of the person.

5,586,704
SHOULDER HOLSTER AND METHOD OF CARRYING A PORTABLE TELEPHONE NEAR THE BODY OF A USER
Tommy Alexander, 419 Durham Rd., Stanley, N.C. 28164, and Shawn B. Jenkins, Charlotte, N.C., assignors to Tommy Alexander, Stanley, N.C.
Filed Mar. 7, 1995, Ser. No. 399,893
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—605 **4 Claims**

1. In combination with portable telephone means comprising a telephone and a protective jacket for holding the telephone therein, and said jacket including a front, substantially planar wall having respective transmitter and receiver openings residing adjacent to a transmitter and receiver portion of the telephone and a center window spaced from each of the receiver and transmitter openings for exposing a plurality of push buttons of said telephone, the jacket further including an attached flap for removably covering said transmitter and receiver openings and said center window, a shoulder holster for carrying the telephone means near the body of a user for storage of and ready access to the telephone means by the user, said holster comprising:

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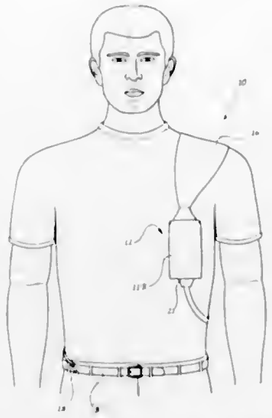
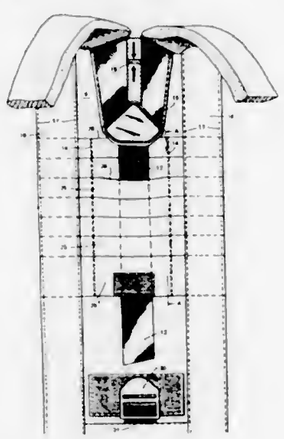


(a) a supporting shoulder strap having opposing ends and extending generally over the shoulder and under the arm of the user during wear;
(b) a telephone mounting panel attached to respective ends of the shoulder strap, and residing near the chest of the user during wear; and
(c) complementary attachment means located on said mounting panel and on a back wall of said protective jacket for removably attaching the telephone means to said mounting panel.

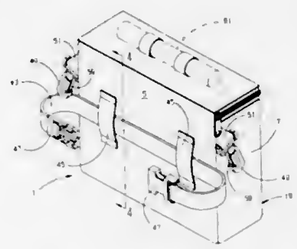
5,586,705
RUCKSACK HARNESS
James Leonard, Dublin, Ireland, assignor to Lowe Alpine Systems International Limited, County Offaly, Ireland
PCT No. PCT/IE94/00027, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/26143, PCT Pub. Date Nov. 24, 1994
PCT Filed May 11, 1994, Ser. No. 545,866
Claims priority, application Ireland, May 14, 1993, S930368
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—631 **13 Claims**

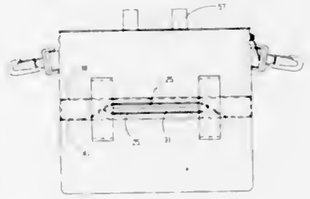


1. A rucksack having a carrying harness, the carrying harness comprising:

two shoulder carrier straps connected at one end thereof to the rucksack;
a harness yoke to which the other ends of the shoulder straps are joined, and
yoke engagement means on the rear wall of the rucksack to receive the harness yoke in height-adjustable engagement;
wherein the yoke engagement means comprises a plurality of overlapping transverse slats attached to the rear wall of the rucksack which define a plurality of overlapping open-ended sleeves into a selected one of which sleeves the harness yoke may be inserted.

5,586,706
WAIST BAG
Mary E. Ritzenhein, 354 Western Ave., Fond du Lac, Wis. 54935
Filed Jan. 20, 1995, Ser. No. 375,797
Int. Cl.[6] A45C *13/18*
U.S. Cl. 224—671 **3 Claims**

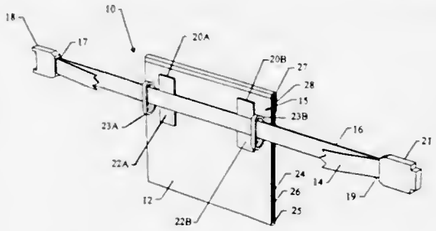




1. A waist bag comprising:
a. a belt having opposed ends with buckles thereon of predetermined size;
b. a pouch having front, back, top, and bottom sides and opposed ends, wherein:
i. the pouch back side has a lower portion fabricated from a first piece of flexible material and having an upper edge;
ii. the pouch back side has an upper portion fabricated from a second piece of flexible material and having a lower edge;
iii. a zipper connects the lower edge of the second piece of material to the upper edge of the first piece of material;
iv. a third piece of material is located inside the pouch and has an upper end sewn to the lower edge of the second piece of material adjacent the zipper and a lower end sewn to the first piece of material proximate the pouch bottom side; and
v. a flexible decorative strip extends outside of the pouch back side between the two ends thereof and is sewn to the second piece of material proximate the zipper and sewn to the first piece of material for short distances from each of the two pouch ends, the decorative strip overlying the zipper; and
c. a pair of loops fastened to the pouch back side and having a size sufficient to enable the belt and buckles to slide without resistance therethrough.

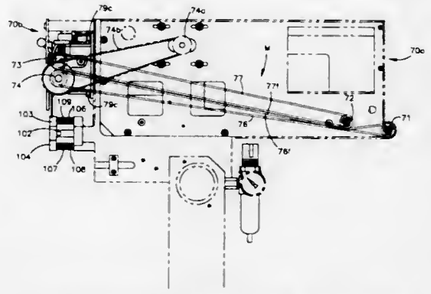
so that a person can wear the waist bag around the person's waist and cutting and pulling the belt from the person does not pull the pouch from the person, and so that the upper edge of the first piece of material, the lower edge of the second piece of material, the zipper, and the third piece of material cooperate to form a hidden pocket in the back side of the pouch and the decorative strip selectively conceals the zipper.

5,586,707
HOLDER FOR SCORECARDS
Christopher F. Haskell, 73 Kenneth Rd., Marblehead, Mass. 01945
Filed May 25, 1995, Ser. No. 450,635
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—684 **16 Claims**



1. A holder for a scorecard, the holder comprising:
a) a scorecard retaining unit comprised of a first section, a second section, and a third section; each section being generally flat and generally rectangular and having an inside face, an outside face, a first end, and a second end; the first section having its firm end free and its second end connected by a first hinge means to a first end of the second section; the second end of the second section connected by a second hinge means to a first end of the third section; and the second end of the third section being free; such that the retaining unit may be folded along the first and second hinge means so that the inside faces of the first and second sections are in a contacting relationship and the third section folds over the first end of the first section such that its inside face is in a contacting relationship with the outside face of the first section;
b) a means for slidably securing the scorecard retaining unit to the user's waist so that the user may slide the scorecard retaining unit about substantially the entire waist of the user;
c) a means for retaining a scorecard secured to the inside face of one of the sections, the scorecard retaining means is comprised of a narrow elasticized band having a first end and a second end and travelling freely across substantially the entire inside face of the section upon which a scorecard is to be retained; the elasticized band being secured at each of its ends to the section whereby the wearer's access to the scorecard is not materially interfered with and substantially the entire scorecard may be marked without being removed from the scorecard retaining unit; and
d) the sections of the retaining unit being formed of a flexible material with that material connecting the sections and thereby acting as the first and second hinge means.

5,586,708
PACKAGING MACHINE FEED MECHANISM
Bernard Lerner, Aurora; Richard W. Hess, Hudson; William M. Cronauer, Tallmadge; Rick S. Wehrmann, Hudson, and James D. Kramer, Medina, all of Ohio, assignors to Automated Packaging Systems, Inc., Streetsboro, Ohio
Division of Ser. No. 298,786, Aug. 31, 1994, Pat. No. 5,499,485, which is a division of Ser. No. 954,378, Sep. 30, 1992, Pat. No. 5,394,676. This application Jun. 8, 1995, Ser. No. 488,791
Int. Cl.[6] B65H *20/00*
U.S. Cl. 226—172 **5 Claims**



1. A feed mechanism for feeding a plastic web comprising:
a) a first pair of grooved rolls;
b) a first set of elastic belts reeved about the first pair of rolls to form a first web conveyor, the belts of the first set each having a web feed reach extending between the rolls along a path of travel and opposed return reaches each of the belts of the first set being disposed in associated grooves of each roll of the first pair of rolls;
c) a second pair of grooved rolls;
d) a second set of elastic belts reeved about the second pair of rolls to form a second web conveyor, the belts of the second set each having a web feed reach extending between the rolls along a path of travel and opposed return reaches each of the belts of the second set being disposed in associated grooves of each roll of the second pair of rolls;
e) the feed reaches of the first set being juxtaposed with the feed reaches of the second set whereby to grip opposite faces of a web of plastic film and convey such web along the path;
f) first rolls of each pair being abutting nip rolls at the downstream ends of the feed reaches;
g) second rolls of each pair being an upstream set with the second roll of the first pair being downstream from the second roll of the second pair;
h) the feed reaches of the first conveyor being located in an imaginary plane; and,
i) the second roll of the second pair including a portion on the same side of such imaginary plane as the return reaches of the first conveyor such that the feed reaches of the second conveyor are deflected over and engage surfaces of the second roll of the first pair.

5,586,709
DEVICE TO COMPENSATE THE ELONGATION OF AT LEAST TWO WIRE RODS OR ROUND BARS, WHICH IS ASSOCIATED WITH A DRAWING ASSEMBLY
Giorgio Del Fabro, Tricesimo, and Marcello Del Fabro, Udine, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy
Filed Jul. 18, 1995, Ser. No. 503,857
Claims priority, application Italy, Jul. 20, 1994, UD94A0129
Int. Cl.[6] B65H *20/00;20/02*
U.S. Cl. 226—177 **8 Claims**

1. Device to compensate the elongation of two or more wire rods or round bars on machines fed with two metallic wire rods or

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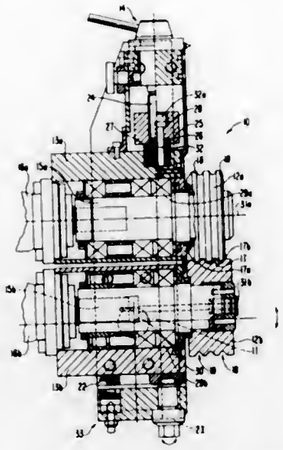
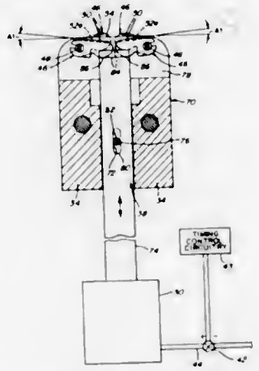


round bars of iron or alloys thereof of a type for building work, the device comprising a pair of opposed rolls comprising an upper roll and a lower roll, the pair of opposed rolls defining between them respective inner and outer passes, with which the wire rods passing through cooperate, at least one roll of the pair of opposed rolls being able to move substantially parallel to itself on a plane containing the axes of the pair of opposed rolls, the pair of opposed rolls having respective shafts fitted to respective upper and lower supports, wherein the lower roll is able to move in a controlled rocking manner on the plane containing the axes of the pair of opposed rolls, the rocking being controlled by a bottom positioning screw and a return spring.

5,586,710
POWER STAPLER

Roman M. Golicz, Clinton, Conn., assignor to Roll Systems, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 976,275, Nov. 13, 1992, abandoned. This application Jan. 12, 1994, Ser. No. 180,427
Int. Cl.[6] B25C *7/00*
U.S. Cl. 227—155 **9 Claims**



7. A clincher assembly for use in a power stapler comprising:

a clincher head defining a plane for receiving a face of a stack of sheets positioned above the plane;

a pair of clinchers having substantially linear surfaces for engaging ends of a staple that is driven through the stack of sheets in a direction downwardly toward the clinchers;

the clinchers each including a respective pivot so that the clinchers move pivotally relative to the clincher head between a position substantially below the plane and a position substantially within the plane;

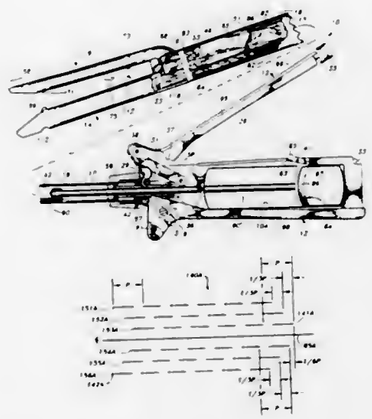
a clincher bar that is operatively connected with and that contacts the clinchers and that moves substantially linearly along a direction of linear motion to cause the clinchers to pivot between the position substantially below the plane to the position substantially within the plane to bend the ends of the staple so that the ends engage the stack; and

wherein the clincher bar includes an elongated slot having a direction of elongation aligned substantially along the direction of linear motion and a shaft located through the elongated slot and substantially fixed relative to the plane, the slot having an upper end and a lower end and the shaft being located so that the upper end is in engagement with the shaft when the clincher bar is located at a position that, thereby, pivotally locates the clinchers so that the linear surfaces each define an angle A1 of approximately 25 degrees whereby the ends of the staple are formed into curves as the ends are driven downwardly into engagement with the linear surfaces.

5,586,711
SURGICAL STAPLER WITH MECHANISMS FOR REDUCING THE FIRING FORCE

Alan K. Plyley; Claude A. Vidal; John L. Minck, Jr., all of Santa Barbara, Calif., and Alan J. Solyntjes, Richfield, Minn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 236,379, May 2, 1994. This application Jun. 1, 1995, Ser. No. 457,877
Int. Cl.[6] A61B *17/068*
U.S. Cl. 227—176.1 **7 Claims**



1. A surgical stapler for applying staples to compressed tissue comprising:

a handle portion having surfaces adapted to be manually grasped by a surgeon;

a cartridge retention portion and an anvil retention portion, means for mounting said cartridge retention portion and said anvil retention portion for relative movement between a closed position in which said cartridge retention portion and said anvil retention portion are in closely spaced relationship for clamping tissue to be stapled therebetween and an open position in which said cartridge retention portion and said anvil retention portion are spaced farther from each other than in the closed position,

an anvil having a plurality of specially shaped surfaces,

said cartridge retention portion having a staple housing for enclosing six rows of staples in substantially parallel, linear rows having proximal and distal ends,

said six rows being spaced laterally across the staple housing such that any line drawn laterally across the staple line crosses at least three staples,

staple drivers adjacent staples, and a plurality of pushers each having camming surfaces, said staple housing being elongate to define a longitudinal axis,

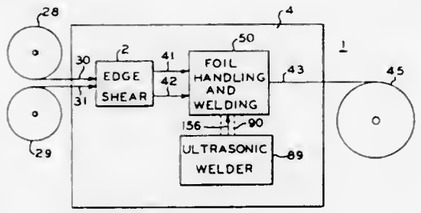
said staple housing having a plurality of longitudinally extending pusher slots adapted to receive said pushers to afford movement of said pushers in a firing direction between pre-fired and fired positions, and a plurality of driver channels for receiving said staple drivers to afford movement of said staple drivers in a staple driving direction between pre-eject and ejected positions; and

each of said staple drivers having a cam follower surface for engaging the camming surface of a pusher to move the staple driver from the pre-eject toward the ejected position to substantially sequentially eject the staples in a row from the staple housing and press the ejected staples against the specially shaped surfaces of the anvil to engage, form and close staples in tissue clamped between the staple housing and the anvil.

5,586,712
APPARATUS FOR JOINING FOILS USED IN SUPERCONDUCTING MAGNETS

Neil G. Fiddes, Columbia; Christopher G. King, Florence; Anthony Mantone, Effingham, and Frank D. Shaffer, Quimby, all of S.C., assignors to General Electric Company, Milwaukee, Wis.

Division of Ser. No. 148,303, Nov. 8, 1993. This application Jan. 9, 1995, Ser. No. 369,957
Int. Cl.[6] B23K *37/04*
U.S. Cl. 228—5.7 **20 Claims**



1. Apparatus for forming joints for foils used in superconducting magnet tape comprising:

means to provide squared end lengths of foils to be joined;

foil handling and positioning means to overlap the square ends of said foils;

means to guide a welder across the overlap;

said foil handling and positioning means including at least two independently controlled foil retainers with edge guards for said foil;

at least one positionable stop to control the sequential positioning of one of said square ends over the other of said square ends;

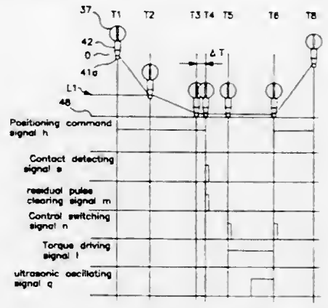
each of said foil retainers being energizable for initial placement and retention of said square ends proximate to each other, deenergizable during overlap positioning of one of said square ends against said at least one positionable stop, and reenergized to retain the positioned foil against said stop; and

means to offset said stop position a predetermined distance to control the amount of said overlap.

5,586,713
METHOD FOR WIRE BONDING

Kiyoshi Arita, and Kouichi Takahashi, both of Fukuma-machi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 30, 1994, Ser. No. 298,148
Claims priority, application Japan, Aug. 31, 1993, 5-215518; Feb. 9, 1994, 6-015179
Int. Cl.[6] B23K *20/10;31/02*
U.S. Cl. 228—102 **5 Claims**



1. A wire bonding method which bonds a wire supplied by a capillary tool supported by a bonding arm to a bonding face of one of (a) a substrate and (b) a semiconductor chip using a bonding force derived from a driving means for driving the bonding arm, said wire bonding method comprising the steps of:

(a) lowering the capillary tool supplying the wire using the driving means controlled by a positioning control.

(b) reducing a lowering speed of the capillary tool almost to zero before the wire contacts the bonding face,

(c) changing the positioning control to a torque control,

(d) instructing the driving means to generate a specified bonding force before the wire contacts the bonding face,

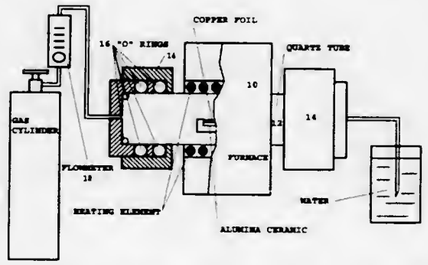
(e) pushing the bonding face with the specified force when the wire contacts the bonding face, and

(f) wire bonding the wire to the bonding face.

5,586,714
METHOD OF BONDING METAL TO A NON-METAL SUBSTRATE

Victor Curicuta; Dennis R. Alexander; Robert J. Deangelis, and Brian W. Robertson, all of Lincoln, Nebr., assignors to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 6, 1994, Ser. No. 319,014
Int. Cl.[6] B23K *26/00*
U.S. Cl. 228—122.1 **13 Claims**



1. A method of directly bonding a metal to a non-metallic substrate, comprising the steps of:

a. placing a metal in contact with a non-metallic substrate;

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b. in the presence of a reactive gas, directly heating said metal by applying energy thereto by use of a laser, such that said reactive gas and metal form a eutectic which simultaneously wets the metal and non-metallic substrate at at least one point of contact therebetween;

such that said metal and non-metallic substrate are caused to be bonded to one another

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5,586,715

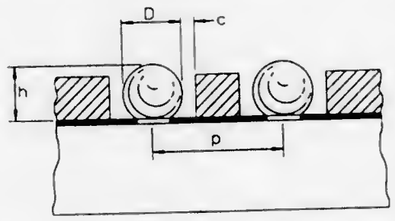
METHOD OF MAKING SOLDER BALLS BY CONTAINED PASTE DEPOSITION

Matthew K. Schwiebert, Palo Alto; Donald T. Campbell, Campbell; Matthew Heydinger, Sunnyvale; Robert E. Kraft, Santa Clara, and Hubert A. Vander Plas, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 287,453, Aug. 8, 1994, Pat. No. 5,539,153. This application Mar. 19, 1996, Ser. No. 617,585

Int. Cl.[6] H01L *21/60;* **H05K** *3/34*

U.S. Cl. 228—248.1 **9 Claims**



1. A method for producing solder balls comprising the steps of:

selecting a mask having a plurality of openings;

selecting a solder paste;

selecting a substrate non-wettable by the solder paste selected;

positioning the mask on the substrate thereby forming a substrate-mask assembly;

applying solder paste to the mask side of the substrate-mask assembly so that the mask openings load with solder paste;

heating the substrate-mask assembly at a temperature sufficient to reflow the solder paste into a solder ball;

removing the mask after formation of the solder ball; and

removing the solder ball from the substrate.

5,586,716

DESIGNER-COVER BOX

John D. Correll, 8459 Holly Dr., Canton, Mich. 48187

Continuation-in-part of Ser. No. 11,739, Aug. 13, 1993, Pat. No. Des. 356,254, Ser. No. 272,677, Jul. 8, 1994, and Ser. No. 86,318, Jul. 6, 1993. This application Jul. 21, 1994, Ser. No. 278,258

Int. Cl.[6] B65D *5/42;5/56*

U.S. Cl. 229—110 **8 Claims**

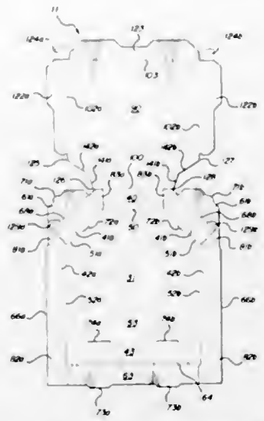
1. A one-piece blank of foldable material cut and scored to define:

a bottom panel,

a rear wall hingedly attached to said bottom panel at a rear wall fold line,

a front wall opposing said rear wall and hingedly attached to said bottom panel at a front wall fold line,

first and second diagonal walls hingedly attached to said bottom panel at first and second diagonal wall fold lines, respectively, said first and second diagonal wall fold lines each being disposed adjacent to and at an oblique angle to said rear wall fold line,



first and second side walls hingedly attached to said bottom panel at first and second side wall fold lines, respectively, said first and second side wall fold lines each being disposed perpendicularly to said front wall fold line and extending to said first and second diagonal wall fold lines, respectively,

first and second ancillary wall panels hingedly attached to a top edge of said first and second diagonal walls, respectively,

first and second corner flaps hingedly attached to a first end of said first and second side walls, respectively,

a cover hingedly attached to a top edge of said rear wall, said cover comprising a cover panel and first and second cover side flaps,

said cover panel having a rear cover edge, a front cover edge opposing said rear cover edge, and first and second side cover edges,

said first and second cover side flaps being hingedly attached to said first and second side cover edges, respectively,

said cover panel having a first section of recessed cover edge disposed between first and second edge points and a second section of recessed cover edge disposed between third and fourth edge points.

5,586,717

CARTON AND CARTON HINGE CONSTRUCTION

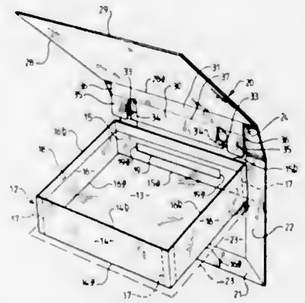
Christopher P. Hallam, Bradford, United Kingdom, assignor to Concept Packaging Limited, Bradford, United Kingdom

Filed Feb. 9, 1995, Ser. No. 385,954

Claims priority, application United Kingdom, Feb. 9, 1994, 9402512

Int. Cl.[6] B65D *5/56;5/64*

U.S. Cl. 229—116.1 **8 Claims**



1. A "book pack" type carton comprising:

a rigid rectangular inner component having four side walls and a bottom connected to the four side walls, the inner component defining an open top for receiving at least one article therein, one of the four side walls being a rear wall having a slot formed on an inner side thereof; and

an outer component assembled with the inner component, the outer component being a one-piece member including:

a generally rectangular base panel connected to the bottom of the inner component and extending beyond three of the four side walls of the inner component which do not include the rear wall;

a generally rectangular intermediate panel contiguous with the base panel and separated therefrom by a first fold line, the intermediate panel extending across the rear wall in a direction from the bottom of the inner component toward the open top of the inner component; and

a cover member for covering the open top of the inner component, the cover member extending beyond the three of the four side walls of the inner component when it covers the open top of the inner component and including:

a generally rectangular outer cover panel contiguous with the intermediate panel and separated therefrom by a second fold line so as to be hingedly connected to the intermediate panel, the cover member being adapted to pivot about the second fold line for covering the open top of the inner component and having an underside;

a generally rectangular inner cover panel contiguous with the outer cover panel and separated therefrom by a third fold line, the inner cover panel being folded upon the underside of the outer cover panel along the third fold line to be in face-to-face relation with the underside of the outer cover panel such that an outer edge of the inner cover panel registers with the second fold line, the inner cover panel further including, at the outer edge thereof, a locating flap having a tongue slidably received in the slot formed on the inner side of the rear wall for assembling the outer component with the inner component.

5,586,718

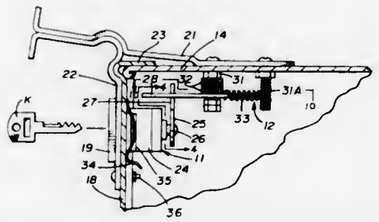
SECURITY MAIL BOX LOCK ASSEMBLY

Stephen A. Speece, Youngstown, Ohio, assignor to Steel City Corporation, Youngstown, Ohio

Filed Feb. 13, 1995, Ser. No. 387,316

Int. Cl.[6] B65D *91/00*

U.S. Cl. 232—17 **6 Claims**



1. A mail box lock assembly securing a door of a rural mail box in a closed position, said rural mail box having cooperating frictional members on said door and said mail box, said lock comprising; a catch assembly and a lock assembly, said lock assembly comprising a cylinder keyed lock having a lock element with an engagement tab portion extending in planar relation therefrom, said lock element movable from a first locked and pre-set position to a second unlocked position, said catch assembly comprising a latch pivotally secured to said mail box, said latch having a tapered portion on its free end and a locking notch inwardly thereof, spring means on said latch and means for mounting said lock assembly to the door and means for pivotally securing said catch assembly to said mail box wherein, in the pre-set position the tab portion is engageable on a side of said latch opposite said notch such that said mail box door is in said closed position.

5,586,719

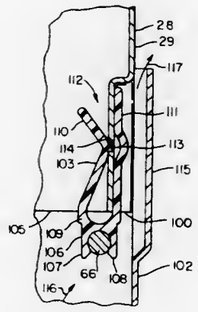
CONTROL SYSTEM FOR A HOT WATER TANK CONSTRUCTION, CONTROL DEVICE THEREFOR AND METHODS OF MAKING THE SAME

Jay R. Katchka, 10455 Hampshire Ct., Cypress, Calif. 90630

Continuation of Ser. No. 145,969, Oct. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 142,491, Oct. 22, 1995, abandoned. This application Nov. 28, 1994, Ser. No. 345,120

Int. Cl.[6] F23N *5/02;* **F22B** *37/42*

U.S. Cl. 236—21 B **20 Claims**



1. In a combination of a hot water tank construction having a combustion chamber means, a source of fuel, burner means for heating water in said tank construction and being disposed in said combustion chamber means of said tank construction, flame detecting means having means for generating an electrical current when sensing a flame at said burner means, and a control device for interconnecting said source of fuel to said burner means, said control device comprising a housing means, an electromagnetic means carried by said housing means, a movable valve means carried by said housing means and normally being disposed in a closed position thereof to prevent said source from reaching said burner means and being adapted to be held in an open position thereof by said electromagnetic means as long as said electromagnetic means remains energized so that said source of fuel can be interconnected to said burner means, said flame detecting means being operatively interconnected to said electromagnetic means to direct said electrical current thereto to energize said electromagnetic means, and a temperature responsive electrical switch means carried by said housing means and being operatively interconnected to said electromagnetic means so that said electromagnetic means is adapted to be energized by said flame detecting means when said switch means is in a first operating condition thereof by sensing a temperature below a certain temperature and is prevented from being energized by said flame detecting means when said switch means is in a second operating condition thereof by sensing a temperature above said certain temperature, the improvement wherein said switch means has a portion thereof disposed remote from said housing means and in a position to sense the temperature of an adverse heat roll out from said chamber means and thereby be in said second operating condition thereof if said sensed temperature of said heat roll out is above said certain temperature, said tank construction having wall means, said portion of said switch means being fastened to said wall means, said wall means having an opening means therethrough and defined by peripheral edge means of said wall means, said portion of said switch means having a part thereof comprising a fastening means and being fastened by said fastening means to a part of said peripheral edge means of said wall means.

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5,586,720

HOT WATER SUPPLY SYSTEM WITH A RING PIPELINE

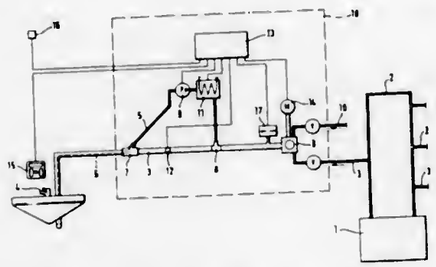
Herbert Spiegel, Marktplatz 5, D-97464 Niederwerrn, and Robert Böhm, Schonungen, both of Germany, assignors to Herbert Spiegel, Niederwerrn, Germany

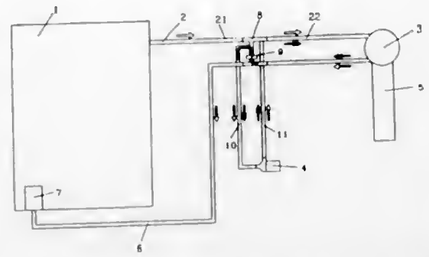
Filed Mar. 21, 1995, Ser. No. 407,914

Claims priority, application Germany, Mar. 23, 1994, 44 09 927.4

Int. Cl.[6] F24D *3/02*

U.S. Cl. 237—8 R **12 Claims**





1. A hot water supply system, comprising:

a water heater;

a circulation pipeline;

at least one tap pipeline leading to a tap, said tap pipeline having therein said circulation pipeline of a smaller cross-section than said tap pipeline, with a section of said circulation pipeline extending from an interior portion of said tap pipeline and outwardly from said tap pipeline and terminating opening in proximity to said tap, said circulation pipeline being comprised of a pressure-proof material for that portion extending outwardly from said tap pipeline;

a first pipe branch piece made of continuous pipe, said first pipe branch piece being a component of said tap pipeline and having a branch pipe which receives said circulation pipeline, with a longitudinal axis of said branch pipe forming an acute angle with a longitudinal axis of said tap pipeline, the acute angle formed being open opposite a direction of flow in said tap pipeline with the section of said circulation pipeline extending to said tap being inserted endways into said branch pipe;

a second pipe branch piece; and,

a ring pipeline extending through said water heater in which heated water circulates in said ring pipeline before proceeding therefrom to at least one of said tap pipelines then to said tap, with ends of a remaining section of said circulation pipe joining at said branch pipe and, via said second pipe branch piece, open at said ring pipeline.

5,586,721

DUAL-CIRCUIT VEHICLE HEATER

Michael Humburg, Göppingen, Germany, assignor to J. Eberspächer, Esslingen, Germany

PCT No. PCT/DE94/00735, § 371 Date Aug. 17, 1995, § 102(e) Date Aug. 17, 1995, PCT Pub. No. WO95/03187, PCT Pub. Date Feb. 2, 1995

PCT Filed Jun. 23, 1994, Ser. No. 522,298

Claims priority, application Germany, Jul. 21, 1993, 43 24 371.1

Int. Cl.[6] B60H *1/02*

U.S. Cl. 237—12.3 B **15 Claims**

1. A vehicle heating system, comprising:

a heater including means for generating heat by burning fuel for releasing heat to a fluid heat carrier;

a vehicle drive engine;

a heat exchanger for heat exchange with the interior space of the vehicle;

a heat carrier circuit with a flow pipe with an inlet, said flow pipe leading from the vehicle drive engine to said heater and leading from said heater to said heat exchanger, said flow pipe having an inlet and a return, which leads from said heat exchanger to said vehicle drive engine, as well as with a flow connection, which leads from said return to said inlet of said flow pipe, said inlet being located between said vehicle drive engine and said heater, a secondary circuit being formed, which passes through said heater and said heat exchanger bypassing said vehicle drive engine;

automatically switching two-way valve means with a freely movable switching element in combination with a check valve, said automatically switching two-way valve means being arranged in said flow pipe; and

a connection piece, said check valve being connected to said return by said connection piece.

5,586,722

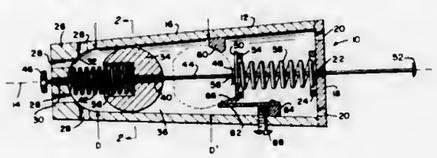
TEMPERATURE AND FLOW CONTROL VALVE

Jerome L. Murray, 12 Aldersgate Cir., Budd Lake, N.J. 07828

Filed May 5, 1995, Ser. No. 435,188

Int. Cl.[6] G05D *23/08*

U.S. Cl. 236—93 B **18 Claims**



1. A temperature and flow control valve, comprising:

a valve housing having a given axis;

first means at one axial end of said housing for admitting fluid therethrough and into said housing; and

second means at the opposite axial end of said housing for discharging fluid therethrough and from said housing; wherein

said second means has a valve seat formed therewithin;

valving means, within said housing, and movable both toward and away from said seat for (a) closing off said second means to prohibit fluid flow through said second means, and (b) accommodating fluid flow through said second means, respectively;

means within said housing, and interposed between said seat and said valving means, for urging said valving means away from said seat;

barrier means, within said housing, for barring movement of said valving means to said one axial end of said housing;

piston means interposed between said barrier means and said first means for moving said valving means onto said seat for closure of said second means to fluid flow therethrough; and wherein

said barrier means comprises means (a) for restraining said piston means from causing movement of said valving means, and (b) responsive to a given temperature of admitted fluid for releasing said piston means, to permit said piston means to move said valving means onto said seat, respectively.

5,586,723

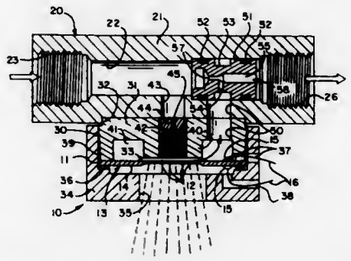
LIQUID SPRAY NOZZLE WITH LIQUID INJECTOR/EXTRACTOR

Shikul Chen, Carol Stream, and Ted Butterfield, Naperville, both of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Filed Oct. 7, 1994, Ser. No. 319,608

Int. Cl.[6] B05B *3/14*

U.S. Cl. 239—102.2 **9 Claims**



9. A liquid ejector comprising a housing defining a chamber having an open side, a vibratable member having first and second sides and at least one discharge aperture extending between said sides, said first side of said vibratable member closing said chamber, said vibratable member being made of a piezoelectric material which is vibratable when subjected to a high frequency alternating current voltage, said housing defining a liquid flow passage for supplying liquid to said chamber, said vibratable member being operable upon being vibrated for ejecting at least a portion of the liquid supplied to said chamber through said discharge aperture, said housing defining an excess liquid siphon passage communicating with said chamber for drawing excess liquid from said chamber not ejected by said vibratable member as an incident to the supply of liquid through said flow passage.

5,586,724

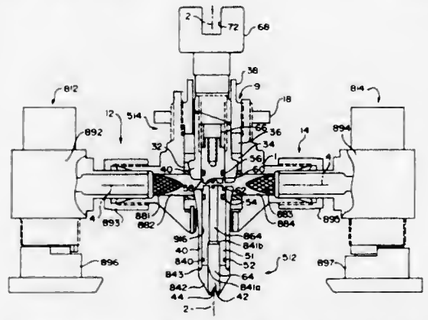
TAPERED PLUG FOAM SPRAY APPARATUS

Peter B. Allen, Slidell, La., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Mar. 9, 1995, Ser. No. 401,606

Int. Cl.[6] B05B *7/04;15/02*

U.S. Cl. 239—112 **6 Claims**



1. A foam spray device for spraying multicomponent foam in response to a flow, under pressure, of first and second reactant fluids from ratio-controlled sources of said first and second reactant fluids, and for purging in response to a flow, under pressure, of purging gas from a gas source, said device comprising:

a body with a cavity defining a principal axis of said body, and also defining first and second reactant fluid inlet ports adapted to be connected to said sources for receiving said first and second reactant fluids, respectively, said first and second reactant fluid inlet ports intersecting said cavity, and being centered on a second axis which is transverse to, and intersects, said principal axis, said body further defining at least a first purge port adapted to be connected to said gas source, said first purge port intersecting said cavity, and being centered on a third axis which is transverse to, and intersects, both said principal and second axes, said cavity extending through said body from an assembly insertion aperture at a first end thereof to a front aperture at a second end thereof, whereby said second and third axes together define a port plane in which said ports lie, said body cavity defining a first inner surface portion in the form of a right circular cylindrical surface which is centered on said principal axis of said body and traversed by said port plane;

a valve bearing of a moldable material in the general shape of a cylindrical annulus, said valve bearing having a right circular cylindrical outer surface centered about a first packing axis, and a cylindrical inner surface which tapers in a particular manner from a first diameter at a front end thereof to a second diameter, larger than said first diameter, at a second end thereof, said valve bearing also defining first and second apertures extending therethrough, coaxial with a second packing axis which is transverse to, and intersects, said first packing axis, and at least a third aperture extending therethrough, coaxial with a third packing axis which is transverse to, and intersects, both said first and second packing axes, said valve bearing being located within said cavity of said body, with said first packing axis centered on said principal axis of said body, with said second diameter portion remote from said front aperture of said cavity, and with said outer surface of said valve bearing contiguous with said first inner surface portion of said body, and with said first, second, and third apertures in said valve bearing lying in said port plane;

a valve and tip piece, said valve and tip piece being centered on a first valve and tip piece axis, said valve and tip piece including a dispensing end and a rotation drive end mutually displaced along said first valve and tip piece axis, and also including a rotational drive attachment at said rotation drive end, said valve and tip piece also defining a longitudinal mixing cavity extending along said first valve and tip piece axis, said valve and tip piece also including a conical portion with an outer surface in the shape of a portion of a cone, said conical portion being centered on said first valve and tip piece axis, said cone tapering from (a) a first diameter adjacent said dispensing end of said valve and tip piece, which first diameter is substantially equal to said first diameter of said cylindrical inner surface of said valve bearing, to (b) a second diameter adjacent said rotation drive end of said valve and tip piece, which second diameter is substantially equal to said second diameter of said cylindrical inner surface of said valve bearing, said conical portion having said particular taper, said valve and tip piece also defining first and second apertures extending therethrough, coaxial with a second valve and tip piece axis which is transverse to, and intersects, said first valve and tip piece axis, said valve and tip piece also including a second portion lying between said rotation drive end and said conical portion, said second portion being in the form of a right circular cylinder centered on said first valve and tip piece axis, with a diameter less than that of said second diameter of said cone, the transition between said first and second portions of said valve and tip piece being made by a bearing surface, said cavity in said valve and tip piece extending from said dispensing end at least to said second valve and tip piece axis, said valve and tip piece being located within said cavity of said body, with said dispensing end protruding from said front aperture of said body, with said rotation drive end accessible from the exterior of said body, and with said first and second apertures in said conical portion lying in said port plane, whereby, in a first rotational position of said valve

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and tip piece, said first and second apertures in said conical portion align with said first and second ports of said body to provide a path between said first and second ports of said body and said mixing cavity in said valve and tip piece, and in a second rotational position of said valve and tip piece, said first and second apertures in said conical portion misalign with said first and second ports of said body, and at least one of said apertures in said conical portion aligns with said purge port, to provide a path between said purge port and said mixing cavity in said valve and tip portion;

a packing washer of a moldable material, said packing washer having an inner diameter substantially equal to said diameter of said second portion of said valve and tip piece, and having an outer diameter no smaller than said second diameter of said conical portion of said valve and tip piece, said packing washer being located within said cavity in said body, and bearing on said bearing surface of said valve and tip piece; and

nonelastic washer compression means including a washer bearing surface and a valve and tip piece clearance aperture, said washer compression means being affixed to said body, with said clearance aperture surrounding said second portion of said valve and tip means, and with said washer bearing surface bearing on said packing washer, for maintaining said packing washer in position by application of pressure thereto, wherehy a seal is formed by which the pressure of said sources is prevented from causing flow of said reactant fluids around said packing washer.

5,586,725

DEVICE FOR PRODUCING AN AIR STREAM HAVING A FLATTENED SHAPE IN TRANSVERSE SECTION

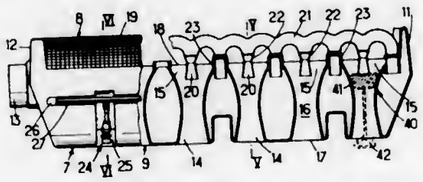
Patrick J. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Filed Nov. 9, 1994, Ser. No. 338,738

Claims priority, application France, Nov. 10, 1993, 93 13437

Int. Cl.[6] A01G *25/09*

U.S. Cl. 239—172 **14 Claims**



1. A device for producing an air stream having a flattened shape in transverse section, this device comprising:

at least two diffusers, each diffuser being formed of a convergent-divergent pipe which is open at both ends, said diffusers being placed in a plane of the longest dimension of the transverse section of the air stream which it is desired to obtain, and

an injector associated with each diffuser, generally coaxial with the pipe forming the diffuser, and situated in its convergent part, being directed toward the divergent part, said injector being connected by compressed air conveying means to a centrifugal compressor such that the compressed air produced by the compressor and sprayed by the injector sets the air located in the diffuser into motion or accelerates it, by a venturi effect,

said device further comprising a box structure which can be fed with compressed air by the centrifugal compressor and constitutes a main manifold, said diffusers being mounted in said box structure so as to be situated in said plane of the longest dimension of the transverse section of the air jet to be produced, and wherein said injectors are placed inside said diffusers and are connected to the inside of the box structure by feed pipes.

5,586,726

COLLISION TYPE FUEL INJECTION NOZZLE AND METHOD OF MANUFACTURING THE NOZZLE

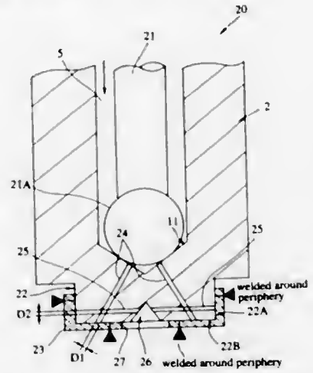
Yuji Furuya, and Kenichi Iino, both of Higashi-Matsuyama, Japan, assignors to Zexel Corporation, Japan

Filed Jul. 28, 1995, Ser. No. 508,867

Claims priority, application Japan, Jul. 29, 1994, 6-196251

Int. Cl.[6] F02M *61/18*

U.S. Cl. 239—533.12 **12 Claims**



11. A method of manufacturing a collision type fuel injection nozzle comprising a nozzle body in which are formed a fuel passage, a collision recess, fuel inlets in communication with the fuel passage, and at least one pair of injection nozzle holes that communicate with the fuel inlets and open out into the collision recess in opposition to each other, and a nozzle element that reciprocates in the nozzle body to inject atomized fuel from the collision recess the method comprising the steps of

forming fuel inlets that extend from the fuel passage and avoid the collision recess,

simultaneously forming the at least one pair of injection nozzle holes in a straight line that intersects the fuel inlets and the collision recess, and

affixing a cap over at least a peripheral portion of the injection nozzle holes.

5,586,727

FLOW REDUCER DEVICES AND DRIP IRRIGATION EMITTER INCLUDING SAME

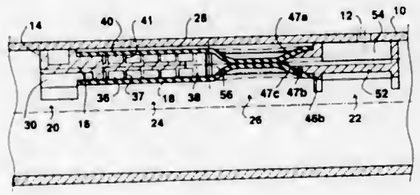
Avraham Shekalim, Nesher, Israel, assignor to Hydromatic Ltd., Migdal Haemek, Israel

Filed Nov. 28, 1994, Ser. No. 348,173

Claims priority, application Israel, Dec. 24, 1993, 108171

Int. Cl.[6] B05B *1/30*

U.S. Cl. 239—542 **16 Claims**



1. A flow reducer device attachable to a tube of pressurized fluid for reducing flow of a fluid therefrom, comprising: a body member formed with a fluid inlet, a fluid outlet, and a flow regulating region between said inlet and outlet;

said flow regulating region including a cavity extending through opposite faces of the body member closed by a side of a deformable diaphragm at each of said opposite faces;

said body member being further formed with an inlet passageway leading from said fluid inlet into the cavity, and an outlet passageway leading from said cavity to the fluid outlet;

said body member being formed with a plurality of baffles to define a labyrinth in said inlet passageway for reducing the pressure of the fluid flowing therethrough into said cavity;

said device being attachable to the tube of pressurized fluid such that an outer face of each diaphragm side is exposed to fluid pressure at said fluid inlet, and an inner face of each diaphragm side is exposed to fluid pressure within said cavity, wherehy the diaphragm sides deform towards or away from each other within said cavity in response to changes in the inlet pressure to regulate the fluid flow via said cavity to said outlet passageway.

5,586,728

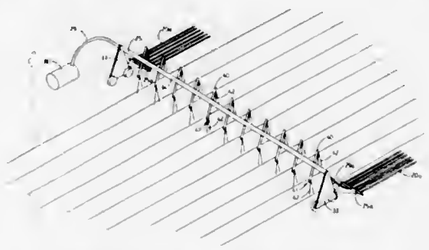
PRE-PLANT SOIL TREATMENT METHOD AND APPARATUS

Michael V. McKenry, 2793 S. Wakefield, Reedley, Calif. 93654

Division of Ser. No. 159,684, Nov. 29, 1993, Pat. No. 5,421,514. This application Mar. 6, 1995, Ser. No. 398,909

Int. Cl.[6] B05B *7/26*

U.S. Cl. 239—734 **5 Claims**



1. A portable apparatus for pre-treating soil before planting comprising:

a. a plurality of low atomizing sprinkler heads that may be removably connected to a first manifold on an existing linear irrigation system, said manifold connected to a water source;

b. a pump means at said water source;

c. a means for mixing biocidal materials with water at said water source for introduction into said apparatus; and

d. a plurality of conduit lines removably deployed behind the motorized assemblies of said irrigation system, each line having a plurality of drip irrigation emitters attached thereto at regularly spaced intervals wherein one end of each line is closed, and each line is attached to a second manifold for connection between the open ends of said deployed conduit lines and said water source.

5,586,729

FUELS BLENDING SYSTEM AND METHOD OF USING

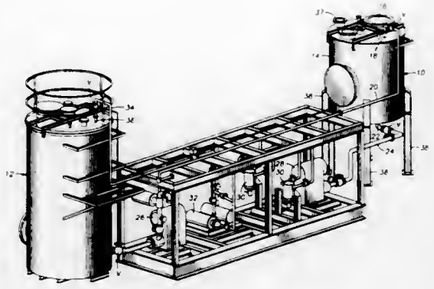
Ricky W. Davenport, 814 Omega Dr., Lafayette, La. 70506

Division of Ser. No. 368,386, Dec. 30, 1994, Pat. No. 5,495,986, which is a continuation of Ser. No. 60,753, May 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,844

Int. Cl.[6] B02C *7/04;7/14;23/02*

U.S. Cl. 241—21 **20 Claims**

1. A method for grinding and dispersing solid particles in a fluid and agitating said fluid to produce a mixture having uniform properties comprising the steps of:



a) introducing coarsely sized solid particles and fluidics material simultaneously into a vessel in which is located a rotary dispersion and agitation means said dispersing means comprising a rotary plate and a stationary plate surrounded by an accumulation ring, said rotary and stationary plate having opposing faces fitted with intermeshing shear blocks, forming an attrition zone therebetween capable of variable displacement and having an inlet and outlet, said attrition zone having a plurality of particle reduction stages;

b) producing a fluidics mixture of said coarsely sized solids and fluidics material via exposure to said rotating dispersion and agitation means, said agitation means further comprising, a plurality of vanes located externally on said rotating dispersion means;

c) agitating and circulating said fluidics mixture in said vessel via said rotating vanes constantly;

d) reducing said coarsely sized solid particles to a consistent size via the striking action of said rotating vanes against said solid particles until such particles are sufficiently sized to allow entry into said inlet of said attrition zone for further size reduction;

e) ingesting sized solid particles and fluidics material into said attrition zone while rejecting all oversized solid particles from said inlet and simultaneously preventing plugging of said inlet with oversize solid particles, due to vane action;

f) processing said ingested mixture of said solid particles and fluidics mixture from said inlet through said plurality of particle reduction stages in said attrition zone;

g) directing said ingested mixture radially through said reduction stages in said attrition zone;

h) shearing said sized solid particles in the ingested mixture to a selectable, particle size as the solid particles travel radially through said attrition zone thus producing a mixture of finely reduced solid particles of a specified size in the fluidics mixture;

i) discharging said reduced solid particle laden fluidics mixture through said outlet in said accumulation ring back into said vessel for reintroduction into the unprocessed fluidics and solid particle mixture; and

j) reprocessing of said fluidics mixture contained within said vessel by said dispersion means until all solid particles introduced into said vessel have been consistently reduced and dispersed into the fluidics component of said mixture.

5,586,730

FLUORESCENT LAMP COLLECTION AND SEPARATION METHOD AND APPARATUS

Jon P. Mortrud, Cottage Grove, Wis., assignor to Budget Lamp Reclaimers, Inc., Madison, Wis.

Filed Mar. 10, 1995, Ser. No. 402,203

Int. Cl.[6] B02C *19/12*

U.S. Cl. 241—24.22 **27 Claims**

1. Mobile lamp collection and separation apparatus comprising: a wheeled mobile vehicle transportable to a facility site where lamps to be processed are located;

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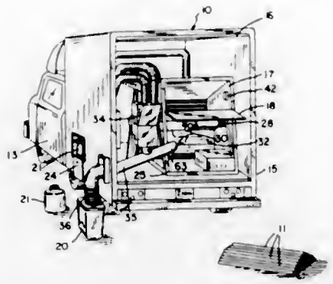


separation apparatus mounted to the mobile vehicle, the separation apparatus comprising:

(a) a collection bin having an interior and a door mounted to open to allow lamps to be placed in the interior of the collection bin and to be closed to seal the interior of the collection bin, the bin having a discharge end;

(b) crusher means, mounted to receive tubes discharged from the discharge end of the collection bin, for crushing the tubes to particulates of glass and metal and dust mixed therewith;

(c) separator means receiving mixtures of crushed glass, metal particulates and powder and separating the particulates and discharging them to a particulates discharge port and discharging the dust carried by air to a dust exhaust discharge port;

(d) conveyor means for conveying the mixtures of crushed glass, metal and dust from the crusher means to the separator means;

(e) a dust filter for filtering dust from air; and

(f) a conduit for conducting the dust carried by air from the dust exhaust port of the separator means to the dust filter, the dust filter collecting the solid dust and having a discharge port from which the collected dust may be discharged.

5,586,731

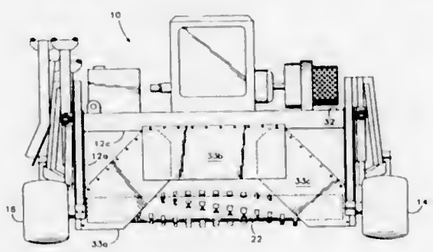
COMPOST MIXING AND AERATING APPARATUS

Bradley S. Glaze, Lyons, and Kenneth R. Warner, Gladstone, both of Oreg., assignors to Frontier Manufacturing Company, Brooks, Oreg.

Continuation-in-part of Ser. No. 918,528, Jul. 21, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,566

Int. Cl.[6] A01B *9/00;* **B02C** *21/02*

U.S. Cl. 241—56 **43 Claims**



1. A drum and paddle assembly for mixing and aerating a windrow of composting material comprising:

a. an elongate drum having a longitudinal axis, first and second end portions, and a center portion, the drum being rotatable about its longitudinal axis at a predetermined rotational speed; and

b. means extending outwardly from the drum for generating a compost entraining air stream when the drum is rotated at the predetermined speed, the compost entraining air stream having a sufficient velocity for entraining substantially all of the composting material therein for mixing and aerating the windrow of composting material when the rotating drum is engaged therewith.

5,586,732

CRUSHING AND DISPERSING BAG

Hiroshige Yamauchi, Kobe, and Shonosuke Nishi, Kawanishi, both of Japan, assignors to Shimakyu Chemical Co., Ltd., Osaka, Japan

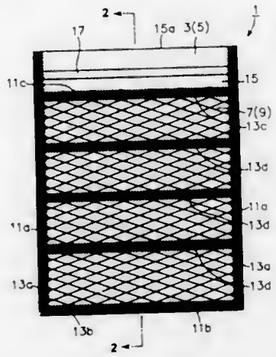
PCT No. PCT/JP93/00963, § 371 Date Dec. 23, 1994, § 102(e) Date Dec. 23, 1994, PCT Pub. No. WO95/02457, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 12, 1993, Ser. No. 360,746

Claims priority, application Japan, Jan. 16, 1992, 4-5808

Int. Cl.[6] A47J *43/04*

U.S. Cl. 241—168 **19 Claims**



1. A crushing and dispersing bag comprising:

a synthetic resin bag member open at one end thereof and being provided with at least a first plurality of parallel ridges, sized to facilitate comminution of material inserted into the synthetic resin bag member by grinding the material into smaller pieces, on an inner surface of the synthetic resin bag member; and

a sealing member for sealing the open end of the synthetic resin bag member;

wherein said synthetic resin bag member has two opposed inner surfaces and said sealing member comprises a groove provided on one of the inner surfaces and a projection provided on the other of the inner surfaces, which projection is sized to be received in the groove in an interference fit, to thereby seal the bag member.

5,586,733

TAKE-UP REEL FOR METALLIC FILAMENTS

Yoshihiro Miura, and Masami Goto, both of Tochigi-ken, Japan, assignors to Bridgestone Metalpha Corporation, Tokyo, Japan

Filed Jul. 19, 1995, Ser. No. 504,007

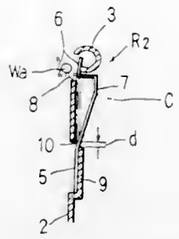
Claims priority, application Japan, Jul. 21, 1994, 6-191878

Int. Cl.[6] B65H *75/28;51/015*

U.S. Cl. 242—125.2 **5 Claims**

1. A metallic-filament take-up reel for carrying a filament, comprising:

a winding drum with first and second axial ends;



first and second flanges having inner sides respectively abutting said first and second axial ends to hold said filament therebetween;

at least one flange of said first and second flanges defining an access hole and a concavity on said inner side thereof, the concavity having a base surface and a peripheral wall descending from said inner side to said base surface;

said at least one flange further defining an aperture in a portion of said peripheral wall;

a metallic-filament retainer having a base portion fixed to said base surface of said concavity, a hook portion, and an intermediate portion connecting said hook portion to said base portion;

said intermediate portion extending from said base portion through said aperture and terminating at said hook portion to dispose said hook portion above the access hole for passage therethrough to catch said filament between said inner side and said hook portion; and

said retainer being formed of a material having a modulus of elasticity sufficient for permitting deflection of said hook portion through said access hole and for retaining said filament between said inner side and said hook portion.

5,586,734

SPINNING REEL HAVING AN ANTI-REVERSE MECHANISM

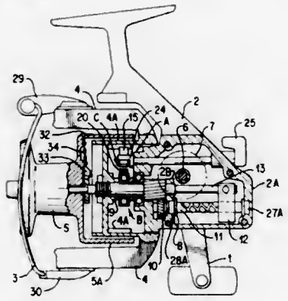
Yuzo Kawabe, Izumi, and Noboru Sakaguchi, Tondabayashi, both of Japan, assignors to Shimano Inc., Osaka, Japan

Division of Ser. No. 59,672, May 12, 1993, Pat. No. 5,547,140. This application Mar. 7, 1995, Ser. No. 400,071

Claims priority, application Japan, May 13, 1992, 4-31071 U

Int. Cl.[6] A01K *89/02;* **F16D** *55/02*

U.S. Cl. 242—247 **11 Claims**



1. A spinning reel comprising:

a reel body;

a rotor provided on said reel body, said rotor including a sleeve shaft rotatable with said rotor and a cylindrical portion surrounding said sleeve shaft;

an anti-reverse mechanism for preventing said rotor from rotating in a line unwinding direction, said anti-reverse mechanism including:

engaging teeth defined on an inner surface of the cylindrical portion of said rotor along its inner periphery;

an engaging pawl supported on said reel body, said pawl being displaceable between an operative position engageable with said engaging teeth and an inoperative position disengaged from said engaging teeth;

a brake mechanism for applying a braking force to said rotor in a line unwinding direction, said brake mechanism including a one-way clutch mechanism mounted on said sleeve shaft;

a selector mechanism for displacing said engaging pawl and operating said braking mechanism, said selector mechanism including a cam member switchable between a first mode and a second mode;

wherein said cam member places said engaging pawl in said operative position and operates said braking mechanism to apply a braking force in said first mode; and

wherein said cam member places said engaging pawl in said inoperative position and operates said braking mechanism to remove said braking force in said second mode.

5,586,735

TWO-DIMENSIONAL SUPERSONIC AND HYPERSONIC AIR INTAKE, WITH THREE MOVABLE RAMPS, FOR THE COMBUSTION AIR OF AN AIRCRAFT ENGINE

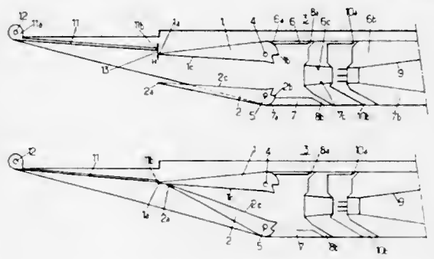
Francois Falempin, Saint Arnoult en Yvelines; Olivier Fourt, Jouy en Josas, and Jean-Louis Pastre, Sainte Genevieve des Bois, all of France, assignors to Office National d'Etudies et de Recherches Aerospatiales, Chatillon-sous-Bagneux, France

Filed Sep. 30, 1994, Ser. No. 316,347

Claims priority, application France, Oct. 1, 1993, 93 11726

Int. Cl.[6] B64D *31/00;33/02*

U.S. Cl. 244—53 B **7 Claims**



1. A two-dimensional variable-geometry supersonic and hypersonic air intake, for the combustion air of an aircraft engine, placed under the wings or the fuselage of the aircraft and comprising two main flaps arranged face to face and each movable about a pivot axis situated in the vicinity of one wall of the air intake which extends the main flap in question rearwards, in which wall is arranged a first boundary layer bleed, the pivot axes of the two main flaps being substantially parallel to the plane of the wings or of the fuselage, so that the abovementioned main flaps move perpendicularly to this plane, wherein a ramp, which is movable about a pivot axis substantially parallel to the pivot axes of the main flaps, and situated in proximity to its leading edge, is arranged upstream of the main flap closest to the wings or to the fuselage, this upstream ramp being adjacent, at its leading edge, to the wings or to the fuselage and delimiting, with said main flap, a boundary layer bleed of variable cross section and wherein the boundary layer bleed of variable cross section may be of zero cross section.

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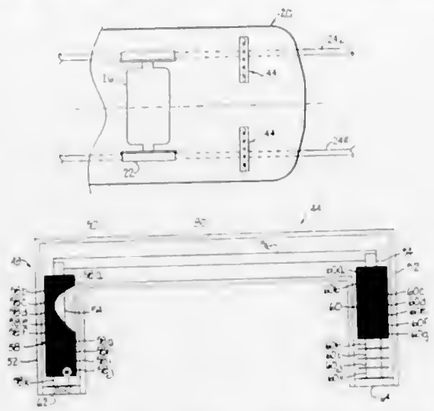
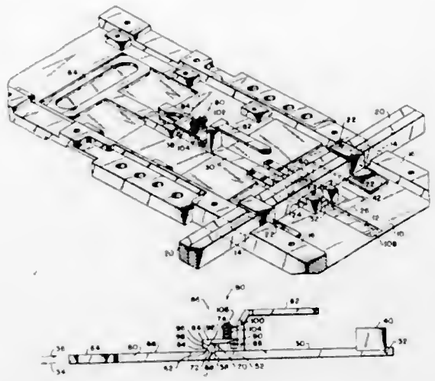
5,586,736
CAB SIGNAL SENSOR WITH NOISE SUPPRESSION
Samuel R. Mollet, Blue Springs, Mo., assignor to Harmon Industries, Inc., Blue Springs, Mo.
Filed Jun. 16, 1995, Ser. No. 491,247
Int. Cl.[6] B61L *3/00*
U.S. Cl. 246—194 **14 Claims**



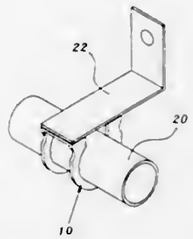
1. In a cab signal system having a receiver on board a locomotive and in which control information transmitted through the rails to the locomotive utilizes a carrier having a frequency in a predetermined range, wherein the locomotive employs an alternating current drive motor that emits high level noise by producing a magnetic field in said frequency range, the improvement comprising:
a pair of horizontally spaced pickup coils for sensing a magnetic field around one of the rails produced by said control information,
each of said coils having an upright axis and an axially extending, magnetic core component, means interconnecting said core components for establishing a flux path therebetween,
means for mounting said pickup coils on said locomotive in an environment in which said noise is present but in operative positions closely spaced from an underlying rail and with the coils spaced transversely thereof,
means interconnecting said coils in a manner to provide voltage addition in response to the magnetic field produced by said control information, and voltage subtraction in response to said noise, and
input circuit means for said receiver operably connected to said coils, whereby to suppress interfering noise from the drive motor and deliver sensed information to the receiver.

5,586,737
SWITCH MACHINE CAM BAR
Daniel W. van Alstine, Rochester, and Charles M. Eggebrecht, Churchville, both of N.Y., assignors to General Railway Signal Corporation, Rochester, N.Y.
Continuation of Ser. No. 293,127, Aug. 19, 1994, abandoned. This application Mar. 28, 1996, Ser. No. 624,186
Int. Cl.[6] E01B *7/00*
U.S. Cl. 246—448 **17 Claims**



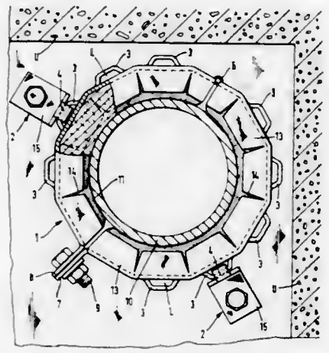
12. A switch machine for switching a position of a railroad track, comprising:
a lock bar having a particular locking position in said switch machine; and
a cam bar having a positioning section, a locking section separably attached to said positioning section for locking said lock bar at said particular locking position, and means for interlocking said locking section to said positioning section,
wherein said interlocking means allows said positioning section to separate from said locking section when said locking section is not able to lock said lock bar at said particular locking position,
wherein said positioning section has a first ridge having a linear sloping edge at one end thereof, and said interlocking means has a second ridge having a linear sloping edge that positions over said linear sloping edge said first ridge so that said locking section is capable of interlocking to said positioning section.

5,586,738
TUBING BRACKET ASSEMBLY
James C. Binelli, Grand Blanc, Mich., assignor to Lab Holding Company, W. Muskegon, Mich.
Filed May 8, 1995, Ser. No. 438,069
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—73 **15 Claims**



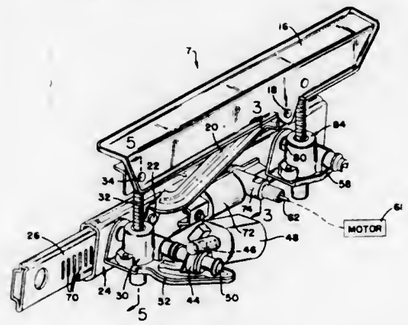
1. A clamp for clamping a tube to a support, said clamp comprising:
two opposed generally C-shaped engagement rings for engaging a tube to be clamped, each of said engagement rings having opposed ends generally facing each other;
two bridging members, one of said bridging members extending between one of said ends of each of said opposed engagement rings and the other bridging member extending between the other one of said ends of each said opposed engagement members such that said bridging members extend generally parallel to one another;
said rings being adapted to partially encircle a tube to be clamped with said bridging members extending generally longitudinally along the exterior Of said tube; and a bracket for mounting said clamp to a support, said bracket being adapted to be attached to said bridging members.

5,586,739
PIPE CLAMP
Gebhard Gantner, Nenzing, Austria; Franz Dengg, Saarbrücken, Germany; Peter Ofner, Feldkirch, Austria, and Herbert Münzenberger, Wiesbaden, Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Mar. 31, 1995, Ser. No. 415,016
Claims priority, application Germany, Mar. 31, 1994, 44 11 220.3
Int. Cl.[6] F16L *3/08*
U.S. Cl. 248—74.1 **10 Claims**



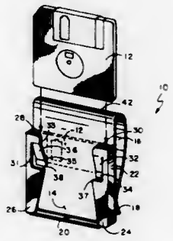
1. Pipe clamp with an annular wall part (1, 21) having a central axis and a circumferentially extending outside surface, at least one attachment part (2) extending radially outwardly from said outside surface of said wall part (1, 21), wherein the improvement comprising that said attachment part (2) having a radially inner section detachably connected to the outside surface of said wall part (1, 21) and a radially outer section, said wall part (1, 21) comprises at least one bracket (3, 22, 23) projecting radially outwardly from the outside surface thereof, and said attachment part being detachably connected to said bracket, and wherein said bracket forms an opening extending parallel to said central axis and arranged to receive said radially inner section of said attachment part.

5,586,740
CHUCKLESS POWER SEAT ADJUSTER SLIDE
Hans J. Borlinghaus, Mt. Clemens; James P. Nini, and Thomas B. Blake, both of Clinton Township, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 19, 1994, Ser. No. 359,305
Int. Cl.[6] F16M *11/00*
U.S. Cl. 248—157 **7 Claims**



1. A four-way powered seat adjuster slide unit comprising:
a top rail for mounting a vehicle seat;
a bottom rail for supporting the top rail;
a guide rail pivotally joined to the top rail and to the bottom rail along generally opposite ends to stabilize the top rail;
a first forward jack screw unit with a powered extendable jack screw, the jack screw unit having fixed pivotal axes in positions fixed with respect to the top and bottom rails; and
a second rearward jack screw unit with a powered extendable jack screw, the jack screw unit having fixed pivotal axes in positions fixed with respect to the top and bottom rails.

5,586,741
CLIP-ON COMPUTER DISC HOLDER
Gregory S. Cuneo, 49 Balcom St., Mansfield, Mass. 02048
Filed May 11, 1995, Ser. No. 439,252
Int. Cl.[6] A47B *96/06*
U.S. Cl. 248—229.26 **3 Claims**



1. A device for removably retaining on a planar member at least one planar computer disc having side edges, comprising:
a one-piece structure having a substantially planar rear wall, said rear wall having a left side, a right side, a top, a bottom, a front surface and a back surface;
a curved spring clip member having a top bend connected to said top of said rear wall, said spring clip member disposed extending downward, from said top bend's connection to said top of said rear wall, adjacent to said back surface of said rear wall and defining a planar member receipt area therebetween, said spring clip member urging toward said back surface of said rear wall for quick and easy installation and removal of said device from said planar member;
a left side wall and a right side wall, each extending a distance, respectively, from said left side and right side of said rear wall, said left side wall and right side wall being perpendicular to said rear wall;
a base extending forwardly and perpendicular from said bottom of said rear wall;
a left front wall and a right front wall extending, respectively, inwardly a distance and perpendicularly from said left side wall and said right side wall, said left front wall and said right front wall each having, respectively, an inside edge, and an unobstructed central opening defined between said inside edges of said left front wall, right front wall, and said base, said side walls and said front walls defining a storage area therebetween;
disc retention means formed from a portion of each front wall, said disc retention means biased to press against and releasably hold said computer disc placed within said storage area to allow for the quick and easy removal and reinsertion of said computer disc out of and into said storage area; and
wherein said disc retention means comprise an L-shaped left cut having a lower portion thereof defined in said left front wall and an L-shaped right cut having a lower portion thereof defined in said right front wall, said lower portions each directed toward one another, said L-shaped left cut and said L-shaped right cut disposed in proximity to said inside edges, respectively, of said left front wall and said right front wall forming, respectively, a left retention member bounded by said L-shaped left cut and said central opening and a right retention member bounded by said L-shaped right cut and

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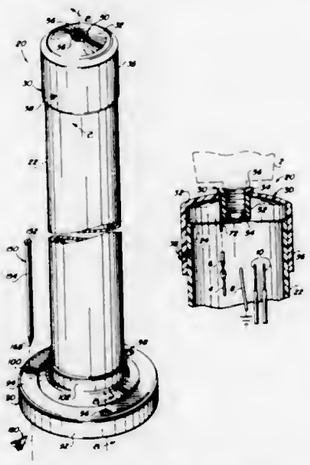
said central opening, each of said retention members bent toward said rear wall to contact, maintain pressure on and releasably hold said computer disc in said storage area.

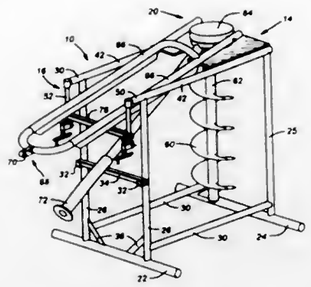
5,586,742
LIGHT STANDARD APPARATUS
E. Ray Carter, 2515 N. 7th St., Phoenix, Ariz. 85006
Continuation of Ser. No. 238,001, May 3, 1994. This application Apr. 22, 1996, Ser. No. 595,099
Int. Cl.[6] F21V *7/00*
U.S. Cl. 248—545 **12 Claims**



1. Light standard apparatus for supporting an electrical fixture to be connected to electrical conductors within the light standard apparatus, including a ground conductor, comprising in combination:
a nonconductive post for receiving electrical conductors, said nonconductive post including a ground conductor therein:
a nonconductive cap secured to the post;
means for securing the electrical fixture to the cap, including a nonconductive bushing; and
means for grounding the electrical fixture, including
a first ground portion in the bushing for providing electrical connection with the fixture, and
a second ground portion connected to the first ground portion to be connected to the ground conductor in the post.

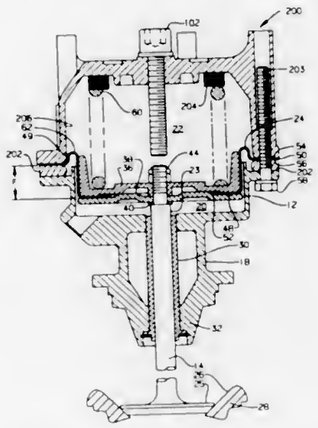
5,586,743
AUGER STAND
Eddie A. Sodolak, 144 Chew Rd., Sealy, Tex. 77474
Filed Jan. 6, 1995, Ser. No. 369,705
Int. Cl.[6] F16M *1/00*
U.S. Cl. 248—671 **26 Claims**

1. An auger stand for an auger assembly, said auger assembly having a hub, an auger extending beneath the hub, a boom extending outwardly from the hub, and a drive shaft, said auger stand comprising:
(a) a rack comprised of a set of front and rear posts connected by support rods and forming a support frame having an opening for receiving the auger;
(b) a support plate member mounted on said support rods proximate the top of said rear posts of said rack and extending laterally across said opening and adapted to fit beneath said auger hub;



(c) said support plate member having an upper surface extending across said opening adapted to receive said auger hub to rest thereon;
(d) said support plate member having a slot extending downwardly therethrough for said auger to extend downwardly from said auger hub through said support plate member; and
(e) coupling assembly connected to said rack forward of said front posts and said support plate member, said coupling assembly comprising a transverse support beam extending across said opening in said support frame for receiving said auger boom thereon and supporting said boom during mounting and dismounting of said auger assembly from a vehicle.

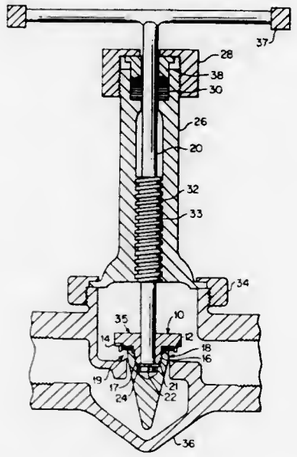
5,586,744
BOOST DEVICE BYPASS VALVE
James C. Smith, Washington, Ill., and Dennis R. Walling, Lafayette, Ind., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 11, 1995, Ser. No. 439,049
Int. Cl.[6] F16K *31/145*
U.S. Cl. 251—61.5 **7 Claims**



1. A bypass valve, comprising:
a housing;
a manifold adapted for containing pressurized gas therein;
a piston movably disposed in said housing, said piston defining first and second chambers in said housing and being actuable between first and second positions;
a first sealing member connected to said piston, said first sealing member being adapted for sealing against an opening of said manifold;

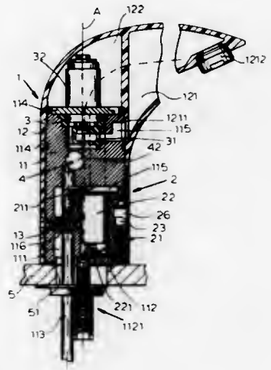
an annular diaphragm connected between said piston and said housing to seal between said first and second chambers, said annular diaphragm flexing as said piston is actuated between said first and second positions;
said annular diaphragm being pre-formed to define an outer annular portion adapted for connecting to said housing, an inner annular portion adapted for connecting to said piston and a middle portion generally U-shaped in cross-section arranged between said outer annular portion and said inner annular portion;
said annular diaphragm flexing uniformly between a first position in which said middle portion is in compression and a second position in which said middle portion is in tension.

5,586,745
VALUE FOR CONTROLLING FLOW OF CRYOGENIC FLUID
Philip A. Knapp, Moore, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jun. 5, 1995, Ser. No. 462,338
Int. Cl.[6] F16K *47/00*
U.S. Cl. 251—121 **25 Claims**



1. A cryogenic valve comprising:
a body having an internal valve chamber with an inlet and an outlet communicating through said body into said valve chamber;
a valve stem, said valve stem disposed at least partially in said body and in communication with said valve chamber;
a needle valve disposed within said valve chamber and affixed to a distal end of said valve stem;
a disk valve in communication with said needle valve and disposed within said valve chamber;
means for sealing and seating said disk valve to said needle valve, and thereby forming a needle valve assembly; and
rotating means for allowing said valve stem to rotate with respect to said needle valve assembly.

5,586,746
FAUCET WITH MOTION-DETECTOR ON/OFF CONTROL
Jörgen Humpert, Hemer; Bruno Heimann, Fröndenberg, and Christian Frankholz, Schwerte, all of Germany, assignors to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Jun. 8, 1995, Ser. No. 488,479
Claims priority, application Germany, Jun. 10, 1994, 44 20 330.6
Int. Cl.[6] F16K *31/06;* **E03C** *1/05*
U.S. Cl. 251—129.04 **8 Claims**



1. A plumbing fixture comprising:
a housing provided with a water inlet and formed with a water outlet and with a circuit pocket;
means for securing the housing to a support surface;
an electrically operated valve in the body between the inlet and outlet and having an electrical feed wire energizable for movement of the valve between a closed position blocking flow between the inlet and outlet and an open position permitting such flow;
an insert fittable in the pocket, provided with a window, and formed with a battery compartment;
means for fixing the insert in the pocket with the window facing forward out of the pocket;
a battery in the compartment; and
electrical circuit means in the insert connected to the feed wire and to the battery and including a proximity detector behind the window for opening the valve on detection of a solid object in front of the housing.

5,586,747
ADJUSTABLE SOLENOID VALVE WITH IMPROVED STABILITY
Gilbert Bennardo, Nice, and Aimé Goubely, La Trinité, both of France, assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 13, 1994, Ser. No. 355,386
Int. Cl.[6] F16K *31/06*
U.S. Cl. 251—129.18 **16 Claims**

1. A solenoid valve having preset manual adjustability of a first (5) armature part relative to the valve body and a second armature part (6) driven by the solenoid relative to the valve body, the parts being separated by a gap (7), characterized by a self-cutting or self-tapping thread (8) moving with the first armature part (5) and adapted to engage a valve body portion (1), thereby presetting said gap (7); wherein said first armature part is characterized by a self tapping threaded portion and a portion of reduced transverse dimension that is free from contact with said valve body portion.

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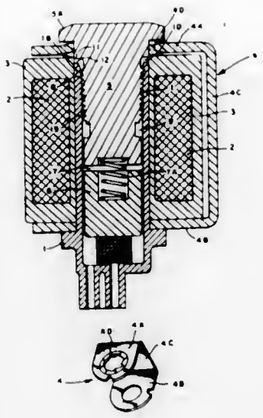
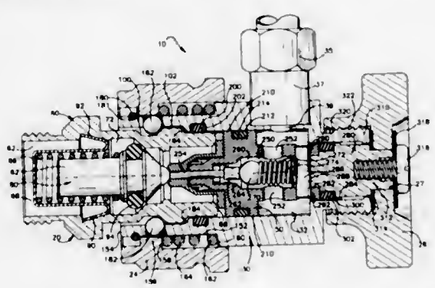


5,586,748
DISCONNECT VALVE ASSEMBLY FOR CONNECTING A SOURCE OF FLUID WITH A CONTAINER TO BE FILLED

Arthur S. Kish, Sarasota, Fla., assignor to JEM Industries, Inc., Willoughby, Ohio

Filed Mar. 29, 1995, Ser. No. 413,097
Int. Cl.[6] F16L *37/28*
U.S. Cl. 251—149.8 **14 Claims**



1. A disconnect valve assembly for connecting a source of fluid with a container to be filled with fluid and comprising:

a tubular body having a fluid passageway extending therethrough from an inlet to an outlet so that fluid may enter said inlet and exit from said outlet;

a depressor located in said passageway intermediate said inlet and said outlet;

a ball-valve check assembly located within said passageway between said inlet and said depressor, said assembly including a stem body slidably mounted within said fluid passageway and having a stem passageway extending therethrough between a stem inlet and a stem outlet, said stem passageway having a first passageway portion and a second passageway portion with said second passageway portion being located downstream from said first passageway portion and being of smaller diameter than said first passageway portion, a radially extending valve seat interconnecting said first passageway portion and said second passageway portion, a ball member having a diameter greater than said second passageway portion but less than said first passageway portion located within said first passageway portion, and spring means located in said first passageway portion for normally resiliently biasing said ball member against said valve seat for preventing passage of fluid through said stem passageway from said first passageway portion to said second passageway portion;

said depressor being carried by said stem body and mounted thereon for relative movement with respect thereto downstream from said second passageway portion, said depressor having an actuator means extending therefrom toward said ball-valve check assembly and extending into said second passageway portion for engaging said ball member upon relative movement of said depressor and said stem body toward each other for displacing said ball member against the resilient bias of said spring means to thereby open said ball valve assembly permitting fluid to flow from said inlet to said outlet;

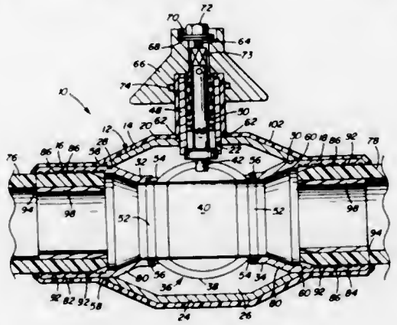
means for imparting slidable movement of said stem body in a first direction and in an opposing second direction; and

means for limiting movement of said depressor in said first direction whereupon further movement of said stem body in said first direction causes relative movement of said depressor and said stem body toward each other for displacing said ball member toward said ball valve assembly.

5,586,749
COMPOSITE POLYETHYLENE AND TRANSITION VALVE

Richard W. Conley, Oakmont; Robert G. Visalli, Murrysville, and James R. Daniels, McDonald, all of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Jun. 17, 1994, Ser. No. 261,719
Int. Cl.[6] F16K *5/06*
U.S. Cl. 251—315.05 **11 Claims**



1. A valve assembly comprising,

a metal valve body having a pair of end fittings with at least one of said end fittings being fabricated of polyethylene to form a composite valve structure combining metal and polyethylene,

said metal valve body including an annular portion, a pair of conduit portions, and a stem housing,

means for connecting said conduit portions and said stem housing to said annular portion to form a unitary valve body free of fastening elements,

said annular portion forming a valve chamber,

said conduit portions including passageways positioned in spaced relation in said annular portion to provide a flow path between said conduit portions through said valve chamber,

a valve closure member positioned in said valve chamber and sealingly connected to said conduit portions for rotation between an open position for directing flow between said conduit portions and a closed position sealing said conduit portions against flow,

a valve stem extending from said closure member through said annular portion and rotatably positioned within said stem housing,

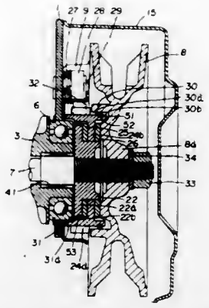
an actuator connected to said valve stem above said stem housing for turning said valve stem to move said closure member between said open and closed positions,

means for connecting said end fittings to said conduit portions to form a unitary valve assembly having a metal valve body and at least one polyethylene end fitting for direct connection to polyethylene conduit,

a second end fitting of said pair of end fittings fabricated of metal,

said polyethylene end fitting extending into gripping engagement with one of said metal conduit portions, and

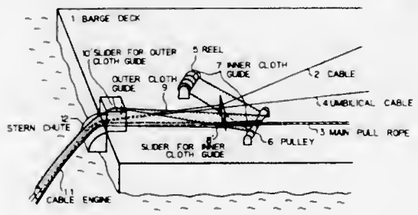
said metal end fitting formed integral with the other of said metal conduit portions.



5,586,750
GUIDE TYPE CABLE ENGINE

Takuji Ezoe, 2-7-14, Tsukushino, Machida-shi, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 378,373
Claims priority, application Japan, Mar. 30, 1994, 5-082716
Int. Cl.[6] B63B *35/03*
U.S. Cl. 254—134.3 SC **4 Claims**



1. A guide type cable engine comprising:

a main pull rope;

a cable to be paid out;

an inner guide tightly enclosing said main pull rope, said inner guide made of a resilient sheet fastened in an elongated cylindrical shape; and

an outer guide enclosing said inner guide, and said cable, said outer guide made of a resilient sheet fastened in an elongated shape,

wherein said inner guide is located at a predetermined position in said outer guide.

5,586,751
MANUAL CHAIN BLOCK

Yoshio Ueno; Yasuo Wada, and Munenobu Honda, all of Sayama, Japan, assignors to Elephant Chain Block Company, Ltd., Osaka, Japan

Filed Sep. 8, 1994, Ser. No. 303,199
Claims priority, application Japan, Sep. 14, 1993, 5-229281; Sep. 14, 1993, 5-229282
Int. Cl.[6] B66D *3/26*
U.S. Cl. 254—352 **3 Claims**

1. A manual chain block comprising:

first and second side plates, spaced apart from each other;

a load sheave rotatably supported between the first and second side plates;

a drive shaft for driving the load sheave;

a driven member coupled to the drive shaft and non-rotatable relative to the drive shaft;

a hand wheel threadedly mounted on the drive shaft;

a ratchet wheel rotatably interposed between the hand wheel and the driven member, the ratchet wheel comprising a boss and an outer peripheral portion having teeth;

a brake pawl supported to the first side plate and engageable with the teeth of the ratchet wheel;

lining plates interposed between the ratchet wheel and the hand wheel and between the ratchet wheel and the driven member, respectively;

a cover portion provided at one of the hand wheel and the ratchet wheel, the cover portion having a peripheral surface and extending toward the other of the hand wheel and the ratchet wheel to cover an outer peripheral portion of the lining plate interposed between the ratchet wheel and the hand wheel;

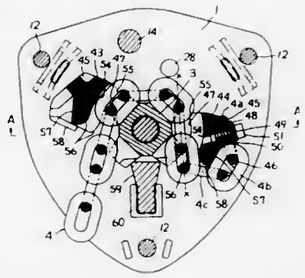
an opposite peripheral surface provided at the other of the hand wheel and the ratchet wheel, the opposite peripheral surface being in opposition to and in close vicinity to the peripheral surface of the cover portion; and

a sealing member interposed between the peripheral surface of the cover portion and the opposite peripheral surface opposed thereto.

5,586,752
LOAD CHAIN RETAINMENT FOR A CHAIN BLOCK

Yasuo Wada, and Yoshio Ueno, both of Sayama, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan

Filed Jul. 5, 1994, Ser. No. 270,659
Claims priority, application Japan, Jul. 2, 1993, 5-164894
Int. Cl.[6] B66D *1/30*
U.S. Cl. 254—372 **6 Claims**



1. A load chain fixing structure in a manual chain block comprising:

a pair of side plates, spaced from each other;

a load sheave, rotatively interposed between said pair of side plates, for supporting a load chain comprising horizontal links and vertical links;

a manual driving means for driving said load sheave to wind said load chain up and down; and

a pair of load chain guides, formed of block-like members and fixed between said side plates at two radial sides of said load sheave, for guiding said load chain when approaching said load sheave and for forcing the chain toward said load sheave, said load chain guides having a chain pushing surface facing said load sheave and a rear surface which opposes said chain pushing surface; wherein a retaining portion is formed on said

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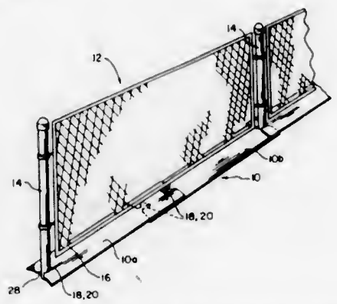
rear surface of one load chain guide, at a non-load side of said pair of load chain guides, so as to retain a horizontal link at an end of a non-load side portion of the load chain, said retaining portion comprising a recessed portion to receive said horizontal link and being provided at its lower part with a load receiving portion, comprising a stepped portion protruding from said chain guide having a corresponding shape to that of a lower end portion of said horizontal link, such that a load acting on said horizontal link at the end of the load chain on the non-load side is transferred to said chain guide by said stepped portion in contact with the lower end portion of said horizontal link received in said recessed portion, said retaining portion being also provided with fixing means for fixing said horizontal link which is received in said recessed portion, to said retaining portion.

5,586,753

FENCE VEGETATION BARRIER

William E. Michiaels, 204 Harrison Blvd., Valparaiso, Ind. 46383

Filed Oct. 27, 1995, Ser. No. 549,266
Int. Cl.[6] E04H *17/02*
U.S. Cl. 256—32 **20 Claims**



1. A fence vegetation barrier for use with a fence having a pair of spaced-apart posts and a lower edge extending therebetween, the fence vegetation barrier comprising:

barrier means receivable beneath the lower edge of the fence, the barrier means having a length in a longitudinal direction, a width in a transverse direction to the longitudinal direction, two oppositely-disposed ends in the longitudinal direction, oppositely-disposed edges in the transverse direction and running along the length of the barrier means, and a center disposed along the longitudinal direction and equidistant from the edges;

first attachment means disposed near a first end of the two oppositely-disposed ends of the barrier means, the first attachment means comprising a first aperture in communication with the first end, the first aperture having a first aperture width in the transverse direction; and

second attachment means disposed near a second end of the two oppositely-disposed ends of the barrier means, the second attachment means comprising a second aperture in communication with the second end, the second aperture having a second aperture width in the transverse direction that is less than the first aperture width;

wherein the first and second apertures are each entirely disposed between the edges of the barrier means and substantially at the center of the barrier means at the first and second ends, respectively.

5,586,754

GRID BLOCK WORKPIECE CLAMPING APPARATUS

Willis R. Williams, 767 S. Fielder, Arlington, Tex. 76013

Filed Aug. 11, 1995, Ser. No. 514,358
Int. Cl.[6] B23Q *3/02*
U.S. Cl. 269—99 **5 Claims**

1. A workpiece clamping apparatus for securing a workpiece relative to a planar support surface provided with a plurality of spaced apertures and a plurality of elongated channels, wherein the workpiece clamping apparatus comprises:

a pair of generally rectangular contoured block members each provided with a plurality of vertically and horizontally aligned slots and apertures; wherein each block member has a contoured base dimensioned to be slidably received in the plurality of elongated channels in the planar support surface;

means for selectively engaging the contoured base of each block member with the spaced apertures and the elongated channels of said planar support surface; and,

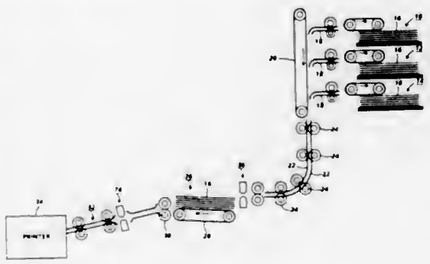
a plurality of threaded securing elements operatively associated with said plurality of vertically and horizontally aligned slots.

5,586,755

MISFEED DETECTOR FOR A STACK OF DIFFERENT WEIGHT SHEETS

Paul Hansen, Westminster, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1995, Ser. No. 387,678
Int. Cl.[6] B65H *7/00*
U.S. Cl. 271—9.06 **20 Claims**



1. In a sheet transport system comprising:

a. a support tray for supporting a stack of sheets,

b. an inlet operably connected to said support tray through which each sheet passes prior to entering into the stack of sheets on said tray,

c. an outlet operably connected to said support tray through which each sheet passes upon being discharged from the stack of sheets on said tray,

d. an inlet sensor at said inlet for sensing the thickness of a sheet passing through said inlet,

e. an outlet sensor at said outlet for sensing the thickness of a sheet passing through said outlet, and

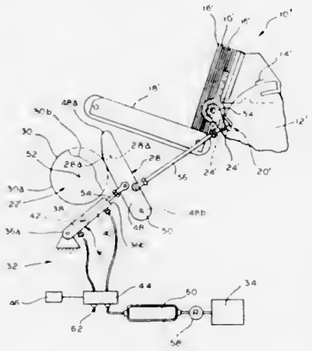
f. means for comparing the thickness value sensed at the inlet sensor with the thickness value sensed at the outlet sensor of the same sheet and generating a signal indicating a misfeed if the values differ by a predetermined amount.

5,586,756

DUAL MODE PNEUMATIC SIGNATURE FEEDING SPRING AND DISABLING APPARATUS

Bobby Chang, 3100 W. Sierra Dr., Westlake Village, Calif. 91362

Filed Nov. 2, 1994, Ser. No. 333,286
Int. Cl.[6] B65H *5/08*
U.S. Cl. 271—11 **12 Claims**



1. In a cyclically operable signature feeding apparatus including a driven rotary drum having a plurality of signature grippers disposed about the periphery thereof, said signature grippers being adapted to grip signatures seriatim from a signature supply means, suction means driven by cam means for shifting signatures seriatim from said signature supply means to said rotary drum for gripping by said signature grippers, said suction means including oscillating suction grippers in communication with a source of vacuum, the improvement comprising:

a cam follower assembly operatively associated with said suction means to control movement of said oscillating suction grippers toward and away from said signature supply means; and

pneumatic means having dual modes of operation including a cam follower spring mode of operation for selectively biasing said cam follower assembly toward said cam means to maintain engagement therewith and a cam follower disabling mode of operation for selectively supporting said cam follower assembly in a position out of the full path of movement of said cam means to thereby disable said oscillating suction grippers;

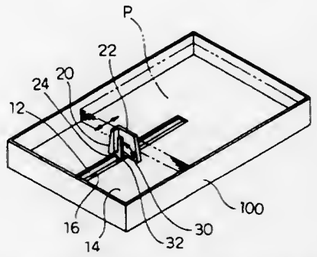
said pneumatic means including a source of pressurized air in communication with a pneumatic cylinder having both a spring chamber and a disabling chamber, valve means intermediate said source of pressurized air and both said spring chamber and said disabling chamber, and control means associated with said valve means for selectively pressurizing one of said chambers and purging the other of said chambers.

5,586,757

PAPER REGULATING MECHANISM AND PAPER CASSETTE

Yasuhiro Nakamatsu; Masao Otsuka; Fumio Hatanaka, and Arihiro Tsunoda, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 12, 1995, Ser. No. 372,048
Claims priority, application Japan, Jan. 14, 1994, 6-002813; Jan. 14, 1994, 6-002814
Int. Cl.[6] B65H *1/04*
U.S. Cl. 271—145 **5 Claims**



1. A paper cassette comprising: a paper cassette body for accommodating stacked paper sheets; a paper stopper for abutting against the end portions of the paper sheets stacked in said paper cassette body; and a support shaft horizontally extending in a through groove formed in the bottom portion of said paper cassette body,

wherein said paper stopper includes a paper abutment portion erected upright, and a sliding sleeve fitted on said support shaft at the lower end of said paper abutment portion,

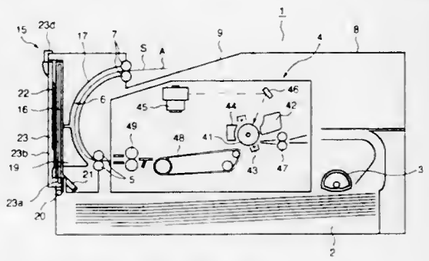
wherein said sliding sleeve has clamping members separated by axial slits from a cylindrical fitting portion thereof, wherein a control lever has said cylindrical fitting portion fitted rotatably on the outer circumferences of said clamping members, and wherein said cylindrical fitting portion is formed with push projections raised radially inward from the inner face of said cylindrical fitting portion.

5,586,758

SHEET DISCHARGE APPARATUS AND IMAGE FORMING APPARATUS HAVING SUCH SHEET DISCHARGE APPARATUS

Shoji Kimura, Kawasaki, and Nobukazu Adachi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1995, Ser. No. 396,643
Claims priority, application Japan, Mar. 3, 1994, 6-060356
Int. Cl.[6] B65H *39/10*
U.S. Cl. 271—303 **22 Claims**



1. A sheet discharge apparatus comprising:

a first sheet discharge path for discharging a sheet;

a second sheet discharge path for discharging the sheet;

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a sheet stacking tray on which the sheets discharged through said second sheet discharge path are stacked and which is pivotally mounted on a body of the apparatus;

a guide rockably supported by said sheet stacking tray so as to protrude from or to drop below said sheet stacking tray, and forming a part of said first sheet discharge path; and

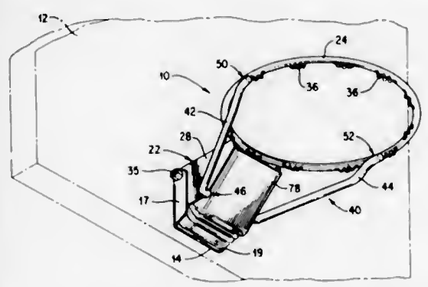
a holding means for holding said guide in a position where said guide forms a part of said first sheet discharge path in a condition that said sheet stacking tray is closed with respect to a body of the apparatus, and for releasing said guide to drop to a position below a stacking surface of said sheet stacking tray so as not to prevent a sheet from being directed to said sheet stacking tray.

5,586,759

BASKETBALL GOAL UNIT

James N. Fitzsimmons, Waukesha, and Randy R. Schickert, Kewaskum, both of Wis., assignors to Huffy Corporation, Miamisburg, Ohio

Filed Jul. 28, 1994, Ser. No. 282,521
Int. Cl.[6] A63B *63/08*
U.S. Cl. 273—1.5 R **63 Claims**



1. A method of assembling a basketball goal unit to a backboard, comprising the following steps:

(a) inserting a first bolt through a hole in a first mounting plate and retaining said first bolt with an elongated coupling nut;

(b) attaching said first mounting plate to said backboard;

(c) pivotably connecting a second mounting plate to said first mounting plate, said second mounting plate supporting a rim therefrom; and

(d) inserting a second bolt through a hole in said second mounting plate and retaining said second bolt in said elongated coupling nut.

5,586,760

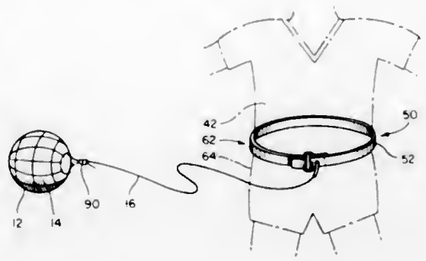
SOCCER TRAINING BELT FOR USE WITH A CORD SUSPENDED SOCCER BALL

Bradley D. Hauter, 433 Harvest Gate, Lake In The Hills, Ill. 60102

Continuation-in-part of Ser. No. 273,761, Jul. 22, 1994, Pat. No. 5,443,576. This application Aug. 2, 1995, Ser. No. 510,357
Int. Cl.[6] A63B *67/10*
U.S. Cl. 273—58 C **12 Claims**

1. A soccer training apparatus, comprising:

(a) a mesh soccer net sized and configured for encapsulating a soccer ball and loosely holding the soccer ball within the mesh soccer net enabling the encapsulated soccer ball to freely rotate within;



(b) a waist belt having first and second belt ends adjustably connectable to one another for securement around a waist of a user;

(c) a cord formed of a non-elastic material, the cord having a first portion attached to the mesh soccer net in a drawstring type fashion by gathering the mesh soccer net, the cord having a second portion operatively connected to the waist belt leaving the mesh soccer net carrying the soccer ball suspended from the waist belt; and

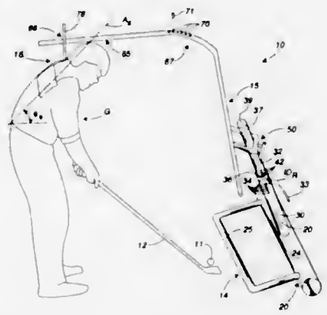
(d) cord adjustment means connected to the cord for manually adjusting the length of the cord between the mesh soccer net and waist belt.

5,586,761

GOLF SWING TRAINING DEVICE

James H. Brock, 2055 Federal Rd., Roswell, Ga. 30075, and Robert P. Foster, 1170 Harrowgrove Ct., Marietta, Ga. 30064

Filed Aug. 26, 1994, Ser. No. 296,969
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—207 **6 Claims**



1. A golf swing training device, comprising:

an indicator;

means for securing said indicator to a golfer so as to reflect the shoulder rotation of said golfer while making a golf swing, said indicator adapted to extend from said golfer in a direction substantially parallel to an axis passing through said golfer's shoulders and substantially perpendicular to an axis passing through said golfer's spine; and

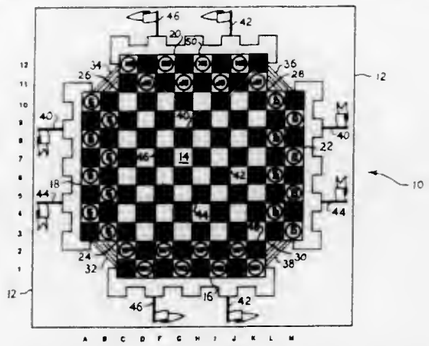
an adjustable guide adapted to be positioned adjacent said golfer for engagement with said indicator, said guide defining a path that reflects a proper shoulder turn to be made by said golfer such that, when said golfer makes a golf swing, said indicator traverses said guide.

5,586,762

METHOD OF PLAYING A QUADRILATERAL CHESS GAME

Jon P. Wearley, Box 248, Augusta, Mont. 59410

Division of Ser. No. 178,380, Dec. 22, 1993, abandoned. This application Nov. 17, 1994, Ser. No. 345,804
Int. Cl.[6] A63F *3/02*
U.S. Cl. 273—261 **5 Claims**



1. A method of playing a chess-like board game providing for simultaneous play by from two to four players or plural teams formed thereof, the method comprising the following steps:

providing first, second, third and fourth groups of chess pieces, with each of said groups of chess pieces including means distinguishing said chess pieces of said each of said groups from said chess pieces of other said groups;

further providing a game board having a central matrix of sixty-four playing positions comprising eight ranks and eight files in a substantially square array, and four sides with each of said sides including an extension having two ranks and eight files of sixteen playing positions extending therefrom, thereby providing a total of twelve ranks across said board in each of four directions starting from each said extension, said central matrix including four corners each having means excluding play thereacross extending between each adjacent said extensions of playing positions, said game board further including means thereon designating and distinguishing from all other ranks of playing positions at an eight rank across said game board in each direction starting from each said extension;

alternatingly moving one of said chess pieces from each of said groups in turn according to the rules of chess;

attempting to advance pawns of each of said groups to reach said rank designation mean at said eighth rank, thereby promoting said pawns to chess pieces of higher value in accordance with the standard rules of chess;

attempting to reach a checkmate position against each of the kings of each of said group of chess pieces; and

continuing in the above manner until a king of only one of said groups of chess piece remains free of checkmate, thereby establishing a winner of said game.

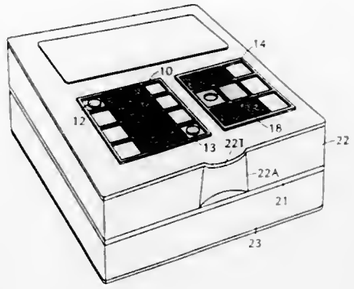
5,586,763

SIAMESE CASE FOR STORING AND PLAYING TWO GAMES

Edward De Bono, L2 Albany Piccadilly, London, W1V 9RR, England, and Maurice S. Kanbar, 2140 Pacific Ave. Apt. #5, San Francisco, Calif. 94115

Filed Sep. 18, 1995, Ser. No. 529,720
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—285 **7 Claims**

1. A Siamese case and two games stored in the case, each game having a play board and playing pieces movable on the board, said case comprising:



A. a central section formed by a pair of open boxes in back-to-back relation, each box being adapted to nest the board of a respective game and to accommodate its play pieces; and

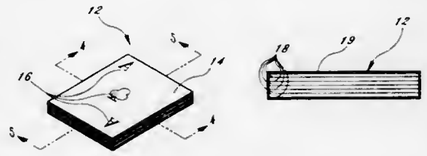
B. a complementary pair of wing sections, each formed by a cover hinged to a respective side of the central section whereby when the cover is folded over its related box, the closed box is then in a storage mode, and when the cover is folded out to expose the open box and its contents, the box is then in a playing mode.

5,586,764

CARD GAME SET HAVING BLOCK SHAPED TILES

Daniel B. Katz, 9979 Nob Hill La., Sunrise, Fla. 33351

Filed Mar. 27, 1995, Ser. No. 409,848
Int. Cl.[6] A63F *1/10;1/00*
U.S. Cl. 273—293 **7 Claims**



1. A novel game set, said set comprising:

(a) a plurality of rigid game pieces for playing a combination of games, each of said plurality of rigid game pieces each comprising a plurality of individually laminated wood layers permanently pressed together to form a high grade plywood piece, having a predetermined thickness sufficient for convenient handling by young, unskilled and arthritic persons, each said plywood piece being of sufficient weight to resist the force of wind and sudden drafts for facilitating the playing of games outdoors, each of said plurality of game pieces bearing an individual traditional playing card indicia to facilitate the playing of traditional western and novel card games;

(b) a waterproof enamel coating completely insulating each of said plurality of rigid game pieces to protect said game pieces from moisture and marring and to protect said game pieces from the defacing of the playing card indicia;

(c) a gripping means, defined by said waterproof coating, for producing a semi-rough surface for easy handling of each of said plurality of game pieces; and

(d) each of said plurality of rigid game pieces being rectangular in shape and having flat side edges and ends for balancing said game pieces vertically and planar continuous surfaces for constructing traditional playing card houses and block structures and for enabling uninhibited slidable removal of said game pieces from said structure.

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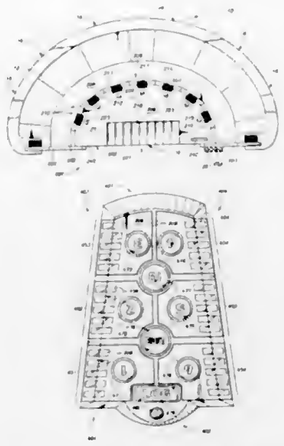
5,586,765
METHOD OF PLAYING A WORD SCRAMBLE GAME
Glenn D. Lackey, 9014 Carlotta Ct., Houston, Tex. 77074
Filed Nov. 18, 1994, Ser. No. 342,148
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—299 **4 Claims**

1	TAFFETA	-	AAFEFTT
2	HARMFUL	-	HULMRAF
3	NECKTIE	-	EECNITK
4	LANTERN	-	NENTRAL
5	WORLDLY	-	RWYLDLO
6	FASCIST	-	ACSSIFT

1. A method of playing a word scramble game for two or more players comprising the steps of:
a) providing a plurality of cards forming a card set wherein each card has printed thereon a plurality of correctly spelled words opposite a scramble version of each such word;
b) providing each player with paper and a writing instrument;
c) providing a timing means;
d) a die;
e) starting a round by each player drawing a card from the card set and positioning the card such that the words on the card are not in clear view of the other players;
f) providing a means for determining which player should be selected to choose and verbally present the scrambled letters to the other player or players;
g) providing a means for presenting the scrambled letters to the other player or players;
h) activating the timing means;
i) each player as quickly as possible, writing on their own paper attempts to unscramble the given letters and form the correct word within the time period;
j) a means for player recognition when the player has formed a word from the given scrambled letters;
k) providing point values to the player who provides the correct word from the scramble letters within the time period;
l) providing point values to the player who first provides a word formed from the given scrambled letters and such word is not the same word provided from the given card selection;
m) providing point values to the player who presented the scramble letters to the other player or players and which no player provided a correct unscramble version of the word;
n) repeating steps g through l until a player wins by reaching a predetermined number of total points.

5,586,766
BLACKJACK GAME SYSTEM AND METHODS
Steven L. Forte, Henderson, Nev., and Randy D. Sines, Spokane, Wash., assignors to Casinovations, Inc., Spokane, Wash.
Continuation-in-part of Ser. No. 242,229, May 13, 1994, abandoned. This application May 12, 1995, Ser. No. 439,687
Int. Cl.[6] A63F *9/00*
U.S. Cl. 273—309 **9 Claims**

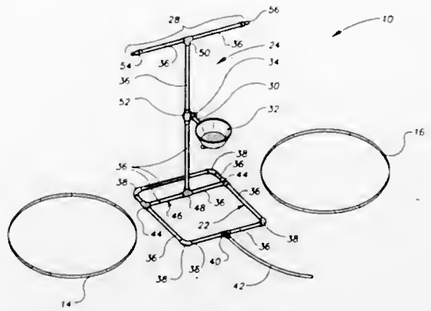
1. An electronic retrofit tabletop game system for mounting upon a blackjack table to allow playing an enhanced blackjack or casino twenty-one card gambling game, comprising:
a central module which rests upon an upper surface of said blackjack table;
a plurality of electronic player counters for registering multiple player count values including at least one player count value for each player, the player count values indicating a number of player jackpot tally events experienced by a particular player; said player jackpot tally events being an event defined



by rules of a particular blackjack game and are countable for purposes of awarding one or more player jackpot bonuses;
a plurality of player keys mounted upon the central module for selectively incrementing the player counters to change player count values for players who have experienced a player jackpot tally event;
means for zeroing the player count values of players who have not experienced a player jackpot tally event;
an electronic dealer counter for registering a dealer count value indicating the number of dealer jackpot tally events experienced by the dealer; said dealer jackpot tally events being an event defined by rules of a particular blackjack game and are countable for purposes of awarding one or more bonuses;
means for selectively incrementing the dealer counter to change the dealer count value if the dealer has experienced a dealer jackpot tally event;
means for zeroing the dealer counter to a zero dealer count value if the dealer has not experienced a dealer jackpot tally event;
a plurality of player status displays which are connected to receive information from the plurality of electronic player counters to display the player count values;
at least one dealer status display which is connected to receive information from the electronic dealer counter to display the dealer count value;
wherein the game system includes a table-top unit having an array of display lights along side edges thereof.

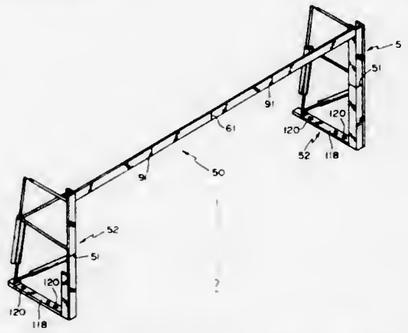
5,586,767
LAWN GAME APPARATUS FOR USE WITH A WATER HOSE
William Bohland, 101 N. 72nd Ave., Pensecola, Fla. 32506
Filed Mar. 21, 1996, Ser. No. 619,006
Int. Cl.[6] A63B *67/00*
U.S. Cl. 273—349 **13 Claims**

1. Game apparatus for use in combination with a water hose and intended to be played by at least two teams, said game apparatus comprising:
a) a framework having a base portion and a water emitting portion extending vertically upward from said base portion, said base portion adapted to operatively receive said hose, said base and water emitting portions being in fluid communication with one another;
b) valve means disposed at an intermediate position within said water emitting portion;
c) an elongated valve actuating member pivotally attached to said water emitting portion, and including a proximal end operatively attached to said valve means and a distal end spaced from said water emitting portion; and



d) projectile receiving means operatively attached to said distal end of said valve actuating member.

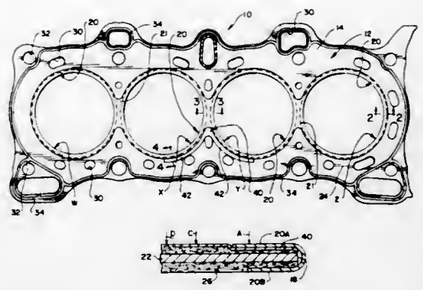
5,586,768
COLLAPSIBLE/PORTABLE SOCCER GOAL
Onofrio F. Pavonetti, 78 Dunwoodie St., Scarsdale, N.Y. 10583
Filed Dec. 12, 1994, Ser. No. 354,477
Int. Cl.[6] A63B *63/00*
U.S. Cl. 273—411 **31 Claims**



1. A collapsible soccer goal for an athletic field comprising: a matched pair of vertical side supporting frame sections, and a crossbar beam having a plurality of horizontal sections; each of said vertical and horizontal sections comprising a locking hinge enabling each said section to be folded in half; said plurality of horizontal sections being detachably connected together by clamping means to form said crossbar beam; and said vertical frame sections each having an overhead elongated hinge removably connectable to a horizontal section for supporting said crossbar beam in a hanging manner from said vertical side supporting frame sections.

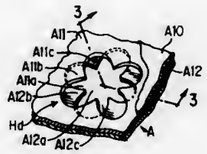
5,586,769
HEAD GASKET WITH PRE-EMBEDDED METAL SHIM AND METHOD OF USING SAME
Martin Novil, Bristol, Wis., and Michael O'Brien, Addison, Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.
Filed May 1, 1995, Ser. No. 432,947
Int. Cl.[6] F16J *15/08*
U.S. Cl. 277—1 **5 Claims**

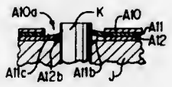
5. A method of reducing the susceptibility of a head gasket to the effects of excessively high local stress comprising the steps of
providing a head gasket comprising a laminate, said gasket defining a plurality of adjacent combustion openings, oil and



water holes and bolt holes, said laminate comprising a metallic core having a pair of main surfaces and fiber-elastomer facing layers on each main surface of said core,
disposing a thin metallic shim on at least one of the facing layers, said shim having elongated arcuate elements lying adjacent to each of a pair of adjacent combustion openings, said shim having a thickness less than that of the facing layer and precompressing the thin metallic shim into the facing layer,
then disposing U-shaped armors in each combustion opening with legs thereof overlapping the edges of the facing layers as well as portions of said arcuate elements adjacent to the edges of the combustion openings, both of said arcuate elements extending beyond the zone of adjacency of adjacent combustion openings, and extending radially outwardly beyond said armor legs, and
prior to installation of the gasket in a service environment, compressing said facing layer under said armor and shim, whereby the facing layer is reduced in thickness under said armor at the locations of said shim, is reduced in thickness by approximately the thickness of the shim where the arcuate elements extend radially outwardly beyond the legs, and is substantially unreduced in thickness radially beyond that.

5,586,770
METAL LAMINATE GASKET WITH ENGAGING DEVICE
Tsunekazu Udagawa, Ichikawa, and Kenji Yamada, Tokyo, both of Japan, assignors to Ishikawa Gasket Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1994, Ser. No. 270,652
Int. Cl.[6] F16J *15/08*
U.S. Cl. 277—11 **7 Claims**





1. A metal laminate gasket adapted to be engaged with an engaging projection of an engine part for immovably locating the gasket on the engine part, comprising,
a first plate including at least one first hole having a size generally corresponding to the engaging projection of the engine part, a plurality of first engaging portions with pointing ends having a size smaller than that of the engaging projec-

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tion, and a plurality of first non-engaging portions, each first non-engaging portion being situated between two adjacent first engaging portions, the width of each first engaging portion sandwiched between two adjacent first non-engaging portions decreasing in a direction toward the pointing end, said first engaging portions and first non-engaging portions defining the first hole, and

a second plate situated above and engaging the first plate, said second plate including at least one second hole having a size generally corresponding to the first hole and located above the first hole, a plurality of second engaging portions with pointing ends having a size smaller than that of the engaging projection and a plurality of second non-engaging portions, each second non-engaging portion being situated between two adjacent second engaging portions, the width of each second engaging portion sandwiched between two adjacent second non-engaging portions decreasing in a direction toward the pointing end thereof, said second engaging portions and second non-engaging portions defining the second hole, said second engaging portions being located above the first non-engaging portions and said second non-engaging portions being located above the first engaging portions so that when the first and second plates are urged against the engine part, the first and second engaging portions deform to allow the engaging projection to enter into the first and second holes and engage the engaging projection to thereby prevent the gasket from easily disengaging from the engaging projection.

5,586,771

SLIDING SEAL WITH HOLE AND GROOVE FOR DISTRIBUTION OF PRESSURIZED FRICTION REDUCING MEDIUM

Pertti Koskinen, Paasikiventie 8 B 9, FIN-33230 Tampere, Finland

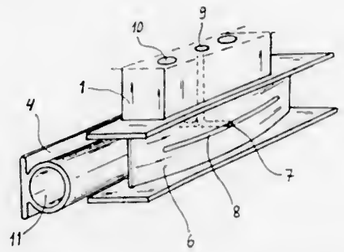
PCT No. PCT/FI94/00397, § 371 Date May 4, 1995, § 102(e) Date May 4, 1995, PCT Pub. No. WO95/07423, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 12, 1994, Ser. No. 433,349

Claims priority, application Finland, Sep. 10, 1993, U930453

Int. Cl.[6] F16J *15/46*

U.S. Cl. 277—34 **8 Claims**



1. An arrangement for sealing an element which is relatively moveable with respect to an elongate slit, and for reducing friction at a sliding interface between said element and a seal for said slit, said seal comprising at least one pressurized tubular sealing member and said element including a tapering part tapering down towards the ends thereof, one side of said tapering part including a hole for feeding a pressurized medium to the sliding interface between the seal and said part, and at least a portion of said part of said element including an elongate groove in communication with said hole and along which said pressurized medium supplied through said hole is fed.

5,586,772

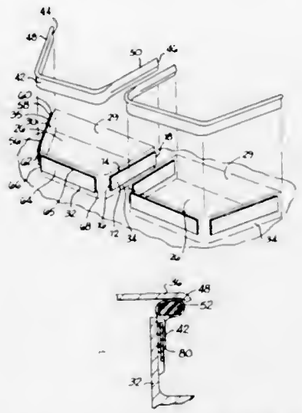
RETROFIT GASKET ASSEMBLY FOR RAILROAD HOPPER HAVING REINFORCING PORTIONS

Ralph Deaver, Waverly, Tenn., assignor to Central Sales & Service, Inc., Waverly, Tenn.

Filed Oct. 20, 1995, Ser. No. 546,278

Int. Cl.[6] F16J *15/10*

U.S. Cl. 277—166 **7 Claims**



1. A gasket assembly for sealing the flanged opening in the bottom of a railroad car, the assembly comprising:

an elongate flexible seal, the seal having a top sealing portion, the seal further including a bottom channel;

a plurality of elongate rigid support members, the support members attach to the flexible seal at the channel; and

the top sealing portion presenting a bulbous shape over a portion of its length corresponding to one of the support members, and the top sealing portion presenting a planar shape over a portion of its length corresponding to another of the support members.

5,586,773

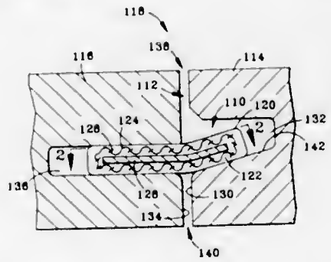
GAS-PATH LEAKAGE SEAL FOR A GAS TURBINE MADE FROM METALLIC MESH

Bharat S. Bagepalli, Schenectady, and Osman S. Dinc, Troy, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1995, Ser. No. 491,758

Int. Cl.[6] F16J *15/12*

U.S. Cl. 277—167.5 **10 Claims**



1. A gas-path leakage seal for generally sealing a gas-path leakage-gap between spaced-apart first and second members of a gas turbine, said seal comprising a cloth-layer assemblage disposed in said gas-path leakage-gap and including a metallic, woven cloth layer having a first group of generally equal-diameter wires which are warp wires and a second group of generally equal-diameter wires which are weft wires, wherein adjacent wires of one of said first and second groups of wires are spaced apart by a center-to-center distance equal to generally between four and ten times the diameter of the wires of the other of said first and second groups of wires.

5,586,774

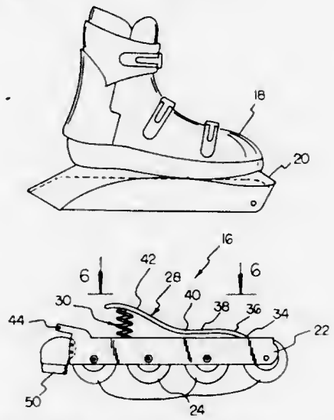
SPRING SUPPORTED IN-LINE SKATE

Patsy Dentale, 2314 E. Third St., Brooklyn, N.Y. 11223

Filed Sep. 15, 1995, Ser. No. 528,930

Int. Cl.[6] A63C *17/06*

U.S. Cl. 280—11.22 **7 Claims**



1. A spring supported in-line skate comprising:

a foot engaging means comprising a boot adapted to receive and engage a human foot therewithin and an inverted, U-shaped outer receiver secured directly to a lower portion of the boot

a rolling support means secured to said outer receiver and movable relative to the foot engaging means for rollingly engaging a ground surface therebeneath, said rolling support means comprising an inner wheel rack of elongated configuration; a plurality of wheels rotatably supported in an in-line configuration within the inner wheel rack; the inner wheel rack being pivotally mounted to a forward end of the outer receiver by a pivot pin directed therethrough wherein the pivot pin comprises an axle rotatably supporting a forward-most one of the wheels;

and,

a spring means interposed between the foot engaging means and the rolling support means for resiliently supporting the foot engaging means relative to the rolling support means.

5,586,775

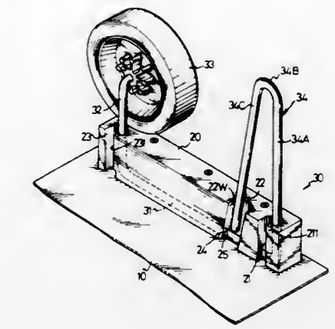
FOLDABLE APPARATUS OF A BAGGAGE CART

Chin-chang Cheng, No. 20, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei Hsien, Taiwan

Filed Jul. 14, 1995, Ser. No. 502,577

Int. Cl.[6] B62B *1/12*

U.S. Cl. 280—38 **4 Claims**



1. A foldable apparatus of a baggage cart comprising

a base plate (**10**),

two elongate sockets (**20**) formed on the base plate (**10**) substantially along two sides thereof;

a first cutout (**21**), a second cutout (**22**), and a third cutout (**23**) being defined in the elongate socket (**20**) and substantially in alignment with each other;

a first flange (**211**) being projected from a wall of the first cutout (**21**);

a channel (**25**) is defined in the socket (**20**) and in communication with the first cutout (**21**), the second cutout (**22**) and the third cutout (**23**);

a pivot (**31**) being pivotally received in the channel (**25**) and having a first end and a second end of said pivot extended outward from the channel (**25**), the first end of the pivot (**31**) being integrally formed as a substantially U-shaped bracket (**34**) which has an upright branch (**34A**) integrally formed with a curved portion (**34B**) connected to a inclined branch (**34C**) which abuts against a wall (**22W**) of the second cutout (**22**) by a resilience of said inclined branch, while a second end of the pivot (**31**) is formed as an upright rod (**32**) which has a wheel (**33**) rotatably connected to said upright rod;

a recess (**24**) being defined in a low portion of the wall (**22W**) of the second cutout (**22**), and being sized to be capable of receiving an end portion of the inclined branch (**34C**) of the U-shaped bracket (**34**);

whereby the foldable apparatus is operable to be in an extended mode in which the upright branch (**34A**) and the upright rod (**32**) are substantially perpendicular to the base plate (**10**) and are respectively retained in the first cutout (**21**) and the third cutout (**23**) by the resilience of the inclined branch (**34C**) and the first flange (**211**), or to a retracted mode in which the upright branch (**34A**) and the upright rod (**32**) are substantially in contact with the base plate (**10**) and an end portion of the inclined branch (**34C**) is received in the recess (**24**).

5,586,776

LAMINATED METAL GASKET HAVING A VARYING BEAD STRUCTURE, THICKNESS, AND OVERLAP WIDTH

Kenji Kubouchi, Hirakatashi; Yuji Fukui, and Kunitoshi Inoue, both of Higashi-Osakashi, all of Japan, assignors to Nippon Gasket Co., Ltd., Osaka, Japan

Filed Jul. 31, 1995, Ser. No. 509,457

Claims priority, application Japan, Aug. 19, 1994, 6-195269

Int. Cl.[6] F16J *15/08*

U.S. Cl. 277—235 B **4 Claims**

1. A metal gasket for a cylinder head comprising:

an elastic metal base plate having a plurality of beads, each of said beads being formed around a respective one of a plurality of juxtaposed holes for combustion chambers;

an elastic metal adjusting plate having a plurality of beads, each of said beads being formed around a respective one of a plurality of juxtaposed holes for combustion chambers; and

a grommet having a plurality of juxtaposed holes for combustion chambers which are smaller in diameter than said holes in said base plates and in said adjusting plates, said grommet being folded about the edges of said holes in said adjusting plate, said adjusting plate lying between said base plate and said grommet in intimate contact therewith to form a plurality

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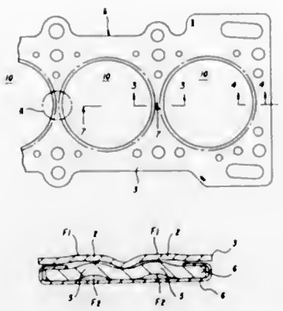
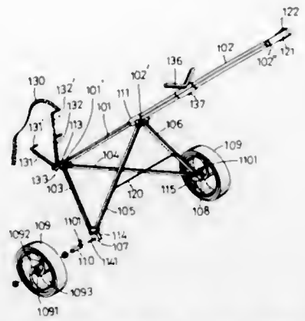




of bores formed by aligning said holes in said base plate, in said adjusting plate and in said grommet;

said bead on said base plate being formed as a full bead between every adjoining two of said holes in said base plate and as a half bead around the remaining edges of each of said holes in said base plate, while said bead on said adjusting plate is a full bead around the entire edge of each of said holes in said adjusting plate, so that each said bead on said base plate extends over each said bead on said adjusting plate between every adjoining two of said bores.

5,586,777

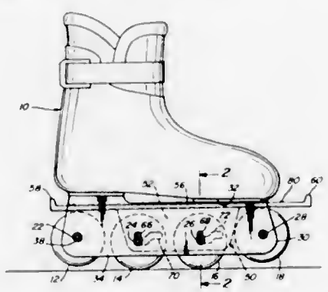
IN LINE SKATE WITH DYNAMICALLY ADJUSTABLE WHEELS

David Wolf, 67 Brackett Rd., Newton, Mass. 02158

Filed Jun. 5, 1995, Ser. No. 462,829

Int. Cl.[6] A63C *17/04*

U.S. Cl. 280—11.22 **9 Claims**



1. A first in-line skate having a plurality of aligned wheels and axles therefor, means for selectively shifting and securing the axle of at least one of the plurality of wheels to and from a secured position below the others of said axles of said plurality of wheels, said shifting means including means engageable by a second in-line skate for effecting the shift dynamically as said first skate is in use and moving.

5,586,778

COLLAPSIBLE GOLF CART

Leif Lindh, Danderyd, and Kjell Lindh, Lidingo, both of Sweden, assignors to Eurogreen International Inc., Chang-Hua Hsien, Taiwan

Filed Aug. 11, 1995, Ser. No. 514,136

Int. Cl.[6] B62B *1/12*

U.S. Cl. 280—40 **7 Claims**

1. A collapsible golf cart comprising:

elongated upper and lower frame parts, said lower frame part being slidably received within said upper frame part in a longitudinal direction thereof, said upper frame part having an upper end which has a handle connected thereto, and a lower end into which said lower frame part is inserted, said lower frame part having a lower end;

means for supporting a golf bag on said upper and lower frame parts;

two legs, each of which has an upper end that is connected pivotally to said lower end of said upper frame part so that said legs can be brought into a collapsed position, wherein said legs are pivoted inwardly and substantially parallel with each other and with said upper and lower frame parts, when said lower frame part is slidably received within said upper frame part and an outwardly extended opened position, wherein said legs and said upper and lower frame parts are moved away from one another when said lower frame part is extended outwardly of said upper frame part, each of said legs further having a lower end which has a wheel suspension means for supporting a removable wheel, and link arms pivotally connected between said lower ends of said legs and said lower end of said lower frame part; and

holding means for maintaining distance between said wheels constant and for maintaining a distance between said wheels and said lower end of said lower frame part constant when said legs are in said opened position.

5,586,779

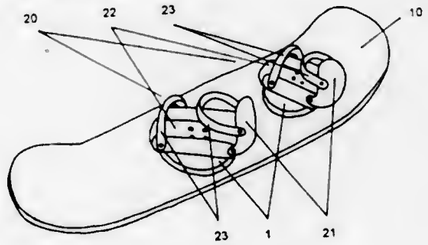
ADJUSTABLE SNOWBOARD BOOT BINDING APPARATUS

Paul J. Dawes, 12422 Skyline Blvd., Woodside, Calif. 94062; Thomas A. Krulevitch, 2833 Kensington Rd., Redwood City, Calif. 94061, and Peter A. Krulevitch, 4319 Railroad Ave. #19, Pleasanton, Calif. 94566

Filed Jun. 6, 1995, Ser. No. 466,989

Int. Cl.[6] A63C *5/00;9/00*

U.S. Cl. 280—14.2 **4 Claims**



1. A snowboard boot binding device comprising:

a binding mount plate for fixedly mounting a snowboard binding thereto, said binding mount plate having a cavity centrally defined therein;

a ring fixedly attached to said binding mount plate, said ring having a bore centrally defined therethrough;

a hub for mounting said boot binding device to a snowboard, said hub being centrally disposed in said cavity and extending through said bore, wherein said binding mount plate and said ring rotate about said hub, thereby allowing for adjustment of an angular position of said binding mount plate, said ring dimensioned to hold said binding mount plate to said hub; and

said binding mount plate to be adjusted.

5,586,780

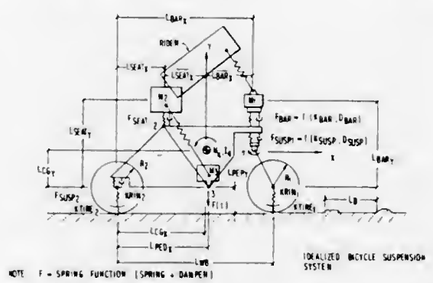
HIGH EFFICIENCY BICYCLE SUSPENSION

Gary G. Klein; Darrell W. Voss, both of Chehalis, Wash., and Lonney Pauls, Estacada, Oreg., assignors to Klein Bicycle Corporation, Chehalis, Wash.

Division of Ser. No. 268,883, Jun. 30, 1994, Pat. No. 5,405,159, which is a continuation of Ser. No. 946,060, Sep. 18, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 313,928

Int. Cl.[6] B62K *25/04*

U.S. Cl. 280—275 **8 Claims**



1. A bicycle having a frame and handlebar-steering and seat assemblies attached to said frame, front and rear ground engaging wheel assemblies attached to said frame, a suspension unit comprising a linkage of pivots and lever arms including as a part of said linkage at least one spring element and at least one rotary shock absorber having a fluid filled cavity and a rotary blade element in said fluid-filled cavity for causing fluid in said fluid-filled cavity to be displaced from one side of said rotary blade element to the other side of said rotary blade element in a substantially friction-free manner, means mounting said suspension unit between said frame and at least one of said handlebar-steering, seat, front and rear ground engaging wheel assemblies and wherein said rotary shock absorber has dynamic resistance, walls and a fluid metering gap between said walls and said rotary blade element, the fluid metering gap between the walls of said fluid-filled cavity and the rotating blade of said rotary shock absorber changes cross-sectional area at different angles of rotation of said vane, in order to change said dynamic resistance of said rotary shock absorber.

5,586,781

VARIABLE RIDE HEIGHT VEHICLE SUSPENSION SYSTEM

Colin J. Anderson, Reservoir Cottage, Gargate Hill Aldershot, Hants GU11 3AA, Great Britain

PCT No. PCT/GB93/02216, § 371 Date May 5, 1995, § 102(e) Date May 5, 1995, PCT Pub. No. WO94/11211, PCT Pub. Date May 26, 1994

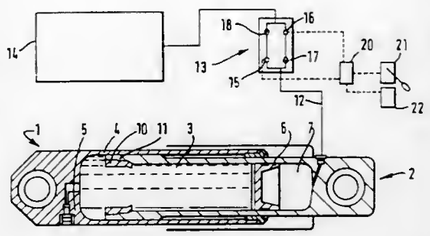
PCT Filed Oct. 27, 1993, Ser. No. 432,150

Claims priority, application United Kingdom, Nov. 7, 1992, 9223414

Int. Cl.[6] B60G *11/26*

U.S. Cl. 280—708 **4 Claims**

1. A hydropneumatic system comprising:



(I) a telescopic strut including

(A) a first chamber including first and second mutually telescopically movable wall parts, said first chamber containing hydraulic fluid;

(B) a second chamber containing pneumatic fluid; and

(C) a free piston means dividing said first chamber from said second chamber;

(II) an auxiliary chamber containing pneumatic fluid; and

(III) selectively operable valve means connecting said auxiliary chamber and said second chamber, said valve means comprising first valve means for allowing unidirectional flow of pneumatic fluid from said auxiliary chamber to said second chamber and second valve means for allowing unidirectional flow of pneumatic fluid from said second chamber to said auxiliary chamber.

5,586,782

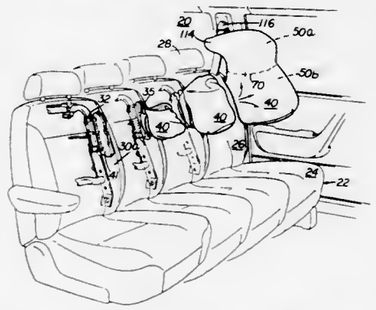
DUAL PRESSURE SIDE IMPACT AIR BAG

Ronald A. Zimmerman, II, Rochester; John C. Hofer, Novi; Douglas E. Medvedik, Lake Orion; Eric D. Veggian, Troy, and Michael J. Lachat, Macomb Township, all of Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Jun. 26, 1995, Ser. No. 494,657

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.2 **12 Claims**



1. A side impact air bag for protecting the side and head of an occupant during a crash or vehicular impact comprising:

a first side joined to a second side,

separating means, a portion of which is located proximate a neck portion of the air bag, consisting of a sew pattern (**46**) joining the first and second sides and dividing the bag into upper and lower chambers and for diverting a predetermined quantity of inflation gas, received from an inflation gas source directly into the upper and lower chambers.

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5,586,783

HYBRID GAS GENERATOR FOR FILLING A GAS BAG

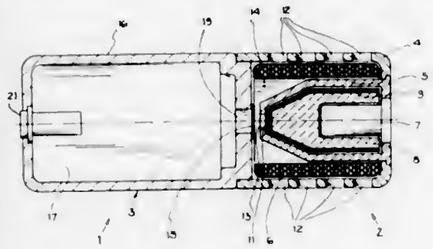
Paul Adam, Munich; Heinz Tillmann, deceased, late of Riemerling; Michael Werner, Höhenkirchen-Siegertsbrunn; Peter Renn, Taufkirchen; Joachim Reif, Sauerlach, and Uwe Döllling, Heldensteln, all of Germany, assignors to TEMIC Bayern-Chemie Airbag GmbH, Aschau/Inn, Germany

Filed Feb. 23, 1995, Ser. No. 393,361

Claims priority, application Germany, Feb. 24, 1994, 44 05 997.3

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 16 Claims



1. A hybrid gas generator, comprising:

a. a pyrotechnic gas generator which is comprised of:

a enveloping housing which is provided with a plurality of outlet openings;

an igniter which is positioned within the enveloping housing;

a mixing chamber which is provided within the enveloping housing and which is in communication with the plurality of outlet openings; and

a combustion chamber which is provided within the enveloping housing in communication with the igniter, which has defined therein a blow-out opening in communication with the mixing chamber, and which contains a propellant composition comprised of a propellant which is oxidizable and an amount in excess of a stoichiometric amount of at least one oxidant for oxidizing the propellant in use to generate a propellant gas which is chemically reactive by igniting the propellant composition with the igniter; and

b. a high-pressure vessel which is comprised of:

a housing which contains gas under pressure;

an outflow opening which is defined in the high-pressure vessel and at which the high-pressure vessel is joined to the pyrotechnic gas generator; and

a sealing disk which is sealingly joined to the housing and positioned between the outflow opening of the high-pressure vessel and the mixing chamber of the pyrotechnic gas generator opposite the blow-out opening of the combustion chamber so that the propellant gas produced in the combustion chamber in use impinges against the sealing disk, and which is comprised of a substance which chemically reacts with the propellant gas so that the propellant gas attacks the sealing disk chemically and thermally, and continuously burns through the sealing disk as in a welding process in use whereby the sealing disk opens with a substantially reduced acoustic pressure and without a bang, the gas from the high-pressure vessel flows into the mixing chamber, mixes with the propellant gas to provide a gas mixture, and the gas mixture flows through the plurality of outlet openings provided in the enveloping housing of the pyrotechnic gas generator into a gas bag.

5,586,784

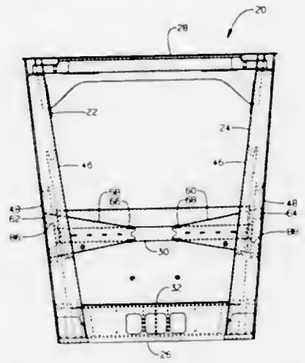
ROLLOVER PROTECTIVE STRUCTURE AND METHOD

Donald R. Mast, Argenta; Robert L. McNabb, Monticello, and Joseph A. Rapp, Morris, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 439,048, May 11, 1995, Pat. No. 5,529,342. This application Mar. 11, 1996, Ser. No. 613,300

Int. Cl.[6] B60R *21/13*

U.S. Cl. 280—756 10 Claims



1. A rollover protective structure for use with construction machinery, comprising:

a base member;

a first post attached to and extending upwardly from said base member, said first post including a first angled post member defining a first interior corner between adjacent first sides thereof;

a second post attached to and extending upwardly from said base member, said second post including a second angled post member defining a second interior corner between adjacent second sides thereof;

a cross member extending between said first angled post member and said second angled post member above said base member;

a first reinforcing member attached between said first sides across said first interior corner and adjacent to said cross member;

a second reinforcing member attached between said second sides across said second interior corner and adjacent to said cross member;

a third reinforcing member attached between said cross member and said first angled post member adjacent to said first reinforcing member; and

a fourth reinforcing member attached between said cross member and said second angled post member adjacent to said second reinforcing member.

5,586,785

VEHICLE WIRE CUTTER

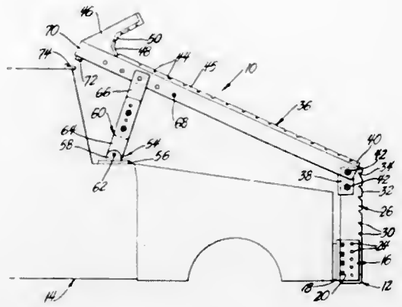
Joseph G. Warner, Sterling Heights, and Christopher J. Bensch, Livonia, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1995, Ser. No. 540,362

Int. Cl.[6] B60R *19/00;21/00*

U.S. Cl. 280—762 1 Claim

1. A wire cutter adapted for installation on a vehicle to sever and protect it from a wire disposed transversely to the direction of vehicle travel, comprising a first bracket adapted to be mounted to the front of the vehicle to be protected, the first bracket having a channel formed therein; a first vertically extending cutting bar having a first end adapted to be attached to and mounted within the channel formed in the first bracket the first cutting bar having a



plurality of serrations on a front face of the first cutting bar, the first cutting bar has a second mounting bracket located on a second end of the bar opposite the first bracket; a second cutting bar having a first end rotatably mounted to the first vertical cutting bar; a cutting hook mounted on a second end of the second cutting bar, the hook being disposed at an acute angle to the second cutting bar and having a beveled edge adapted to engage and sever the wire; a boss mounted on the vehicle juxtaposed a passenger compartment to be protected; an adjustable length support arm having one end attached to the boss and another end attached to the second cutting bar at a location between the ends of the second cutting bar, the support arm length being chosen so as to hold the second cutting bar at an adjustable acute angle to a longitudinal axis of the vehicle; whereby the second cutting bar will make contact with a wire to be severed at an angle which provides a reduced normal stress on the second cutting bar as the wire traverses a cutting edge of the second cutting bar to weaken the wire, and wire hitting the hook will be subjected to a large normal force severing the wire.

5,586,786

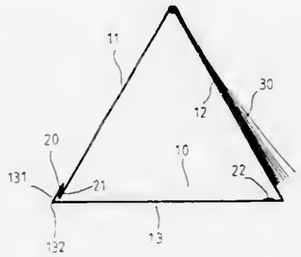
EASEL SHOW FILE DISPLAY BOOKS

Liang-Feng Su, 58, Ma Yuan West St., Taichung, Taiwan

Filed Aug. 21, 1995, Ser. No. 517,057

Int. Cl.[6] A47B *23/00*

U.S. Cl. 281—33 1 Claim



1. A foldable cover is made of recyclable polypropylene, said cover comprising:

an outer movable plate;

a positioning plate;

an inner movable plate;

said outer movable plate extending from one side of said positioning plate, and said inner movable plate extending from the other side of said positioning plate;

a crease line disposed at an outer edge of said inner movable plate defining a foldable outer end edge;

a plurality of transparent envelopes positioned by said positioning plate;

two reinforced ribs which are made of steel wire imbeded in two longer side edge portions of said foldable cover;

said reinforced ribs enwrapped by soft plastic cloth with woven designs;

wherein foldable outer end edge is turned upward to fasten an outer end edge of said outer movable plate, and wherein said outer movable plate and said positioning plate are inclined.

5,586,787

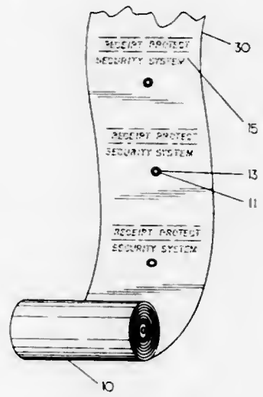
METHOD AND APPARATUS FOR PREVENTION OF REGISTER RECEIPT FALSIFICATION

Jerry W. Brown, and Stewart Brubaker, both of 4303 Victory Dr., St. 303, Austin, Tex. 78704

Filed Dec. 20, 1994, Ser. No. 360,984

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—67 12 Claims



1. A method of printing tamper-resistant records comprising:

providing paper having a first side and a second side, and a marking agent having a predetermined and identifiable photoluminescent characteristic;

printing fixed indicia on the paper using the marking agent;

installing the paper in apparatus equipped with piercing means to pierce said paper;

piercing the paper with the piercing means to form a plurality of apertures therethrough;

installing the paper in apparatus equipped with print means to print variable alphanumeric indicia thereon; and

supplying the marking agent having a predetermined and identifiable photoluminescent characteristic to the print means, and printing variable alphanumeric indicia on the paper.

5,586,788

LABEL FOR OPERATION CONTROL SYSTEM

David F. Laurash, Bellbrook, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Continuation of Ser. No. 276,262, Jul. 18, 1994, Pat. No. 5,486,021, which is a continuation of Ser. No. 961,377, Oct. 15, 1992, Pat. No. 5,383,686. This application Dec. 21, 1995, Ser. No. 575,212

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—81 5 Claims

1. A label form comprising:

a first sheet having a first portion on a first surface thereof with an adhesive associated therewith;

a second sheet located adjacent to said first sheet and having a second portion on a second surface thereof which is positioned adjacent to said first portion, said second portion being substantially coextensive with said first portion and having a

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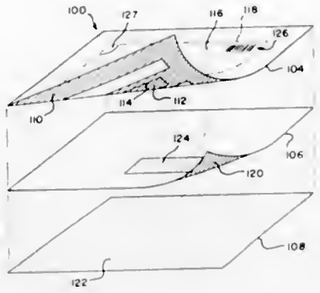


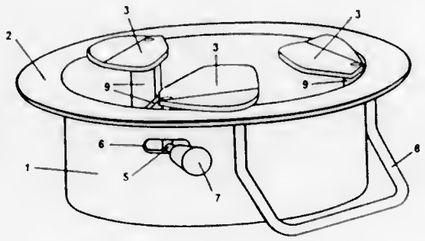
first section coated with release material and a second section without release material.

5,586,789

QUICK CONNECTOR FOR JOINING LARGE DIAMETER VACUUM HOSE TO DUCTWORK

John F. Bently, 11153 S. Wilton River Rd., New Richland, Minn. 56072

Filed Jun. 29, 1995, Ser. No. 496,602
Int. Cl.[6] F16L 35/00
U.S. Cl. 285—38 2 Claims



1. Apparatus for cleaning ductwork comprising:

a hose attachment tube body for receiving a hose at one end and including a flat flange attached at the other end, said flat flange adapted to abut against the surface of the ductwork around a hole in the ductwork,

means for temporarily and removably connecting said hose attachment tube body flange to said surface over the hole therein including;

at least one pivoting rod assembly attached to the interior of said hose attachment tube body, said pivoting rod assembly comprising support ear means, a rod, rod bushings, a compression spring and means extending to the exterior of said hose attachment tube body for manipulating said pivoting rod assembly; said rod being supported by said rod bushings for movement relative thereto, said support ear means connected to one end of said rod and said compression spring arranged to resist axial movement of said rod in a direction toward said other end;

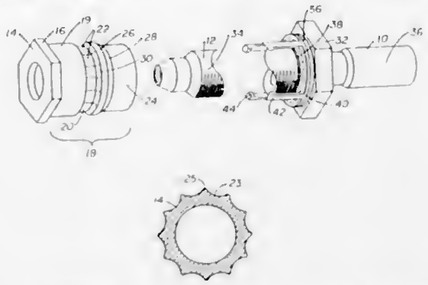
said support ear means engaging the interior of the ductwork adjacent the hole therein when said flat flange is in abutting engagement with said surface over the hole therein and said pivoting rod assembly is manipulated by said means extending to the exterior to move said support ear means through the hole and into engagement with the interior wall adjacent the hole with the wall of the ductwork being thereby clamped between said flat flange and said support ear means by the pressure exerted by said compression spring.

5,586,790

FLUID COUPLING AND FASTENER CAPTURE DEVICE

Kurt K. Bynum, Saline, Mich., assignor to Moeller Manufacturing Co., Inc., Wixom, Mich.

Continuation-in-part of Ser. No. 826,005, Jan. 27, 1992, Pat. No. 5,362,110, and Ser. No. 660,645, Feb. 25, 1991, Pat. No. 5,083,819. This application Nov. 8, 1994, Ser. No. 335,638
Int. Cl.[6] F16L 55/00
U.S. Cl. 285—89 8 Claims



1. A capture device comprising a plurality of tangs extending substantially in parallel longitudinally and axially and attached together at one end of each tang to form a single integral tang portion, said tang portion adapted to non-rotatably engage a first fitting, and said tangs radially spaced from the axis of the first fitting and separated by slots lying in planes containing said axis;

a detent portion comprising a plurality of detents separated by peaks in a substantially cylindrical configuration, said detent portion non-rotatable with respect to a second fitting, said first and second fittings rotationally engageable;

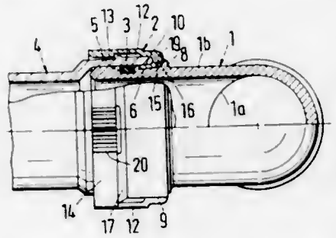
said plurality of tangs flexing longitudinally in engagement with the detent portion as the first and second fittings are rotationally engaged and as the tangs ratchet over the peaks between the detents.

5,586,791

PUSH-FIT CONNECTOR FOR JOINING A FLUID LINE TO A PIPE

Hary Kirchner, Hanau; Ralf Hohmann, and Ralf Spors, both of Bruchköbel, all of Germany, assignors to Rasmussen GmbH, Maintal, Germany

Filed Aug. 14, 1995, Ser. No. 514,694
Claims priority, application Germany, Aug. 19, 1994, 44 29 498.0
Int. Cl.[6] F16L 43/02
U.S. Cl. 285—179 6 Claims



1. A connector for joining a fluid line to a pipe, said connector comprising:

a pipe having an outwardly projecting retaining rib, said pipe having a first end;

an angled pipe section having a first end section which is configured to be connected to the fluid line and a second end section which is configured to be connected to the first end of said pipe, said second end section having at least one outwardly projecting tooth; and

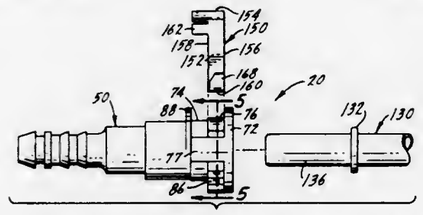
a coupling ring being fixedly connected to said angled pipe section at any one of a predetermined number of relative rotational positions, said coupling ring having a at least two inwardly projecting teeth and a pair of outwardly projecting retaining arms, said at least two inwardly projecting teeth engaging with said at least one outwardly projecting tooth to prevent said coupling ring and said angled pipe section from rotating with respect to each other, said retaining arms being engaged with said retaining rib, said first end of said pipe having an anti-rotation means for preventing rotation of said coupling ring with respect to said pipe.

5,586,792

QUICK CONNECTOR WITH INTEGRAL RELEASE MECHANISM

Gopichand Kalahasthy, Clinton Township, and James R. Zinke, II, Sterling Heights, both of Mich., assignors to Bundy Corporation, Warren, Mich.

Filed Feb. 21, 1995, Ser. No. 391,138
Int. Cl.[6] F16L 37/14
U.S. Cl. 285—319 11 Claims



1. A quick connector coupling for forming a joint in a fluid line system comprising:

a female connector body having a generally cylindrical exterior wall a through bore extending from an end of said connector body, an outer annular rim adjacent said end of said connector body joined to an inner annular rim by spaced support members, the spacing between said support members defining slots, and a raised semi-annular shield formed on said exterior wall adjacent said inner annular rim;

a male member extending through said end of said connector body and into said bore, said male member having a tubular surface and an annular upset, said upset having a greater diameter than said tubular surface;

a retainer demountably coupled to said connector body, said retainer including two spaced beams extending from a cross member spaced from said exterior wall through said slots and being positioned between said male member upset and said connector body end, said beams having a relaxed spacing less than a diameter of said upset such that said male member is secured in said connector body; and

release means associated with said retainer, said release means being cooperable with said exterior wall of said connector body to spread said beams apart a distance greater than said diameter of said upset such that said male member may be withdrawn from said connector body.

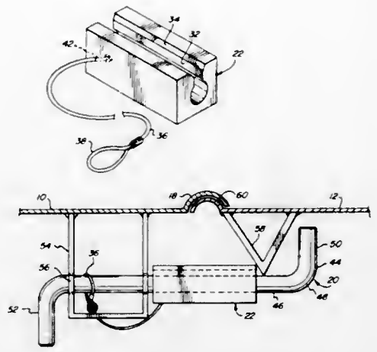
5,586,793

LOCK FOR SLIDE BOLT LATCHES

Charles L. Davenport, 34 Sherry Dr., Southington, Conn. 06489

Filed Dec. 22, 1995, Ser. No. 577,497
Int. Cl.[6] E05C 5/00
U.S. Cl. 292—67 12 Claims

1. A door latch assembly having open and closed positions comprising:



(a) a door latch having

(i) a bracket adapted to be mounted on a door; and

(ii) an elongated bolt having a shank with a handle portion at one end thereof and a locking arm at the other end thereof extending substantially perpendicularly to said shank, said shank adjacent said one end being slidably and rotatably seated in said bracket, said bolt being rotatable at least 90° about its axis to move said arm between a first position to a second position and said bolt being reciprocable axially in said bracket to move said arm portion from a first axial position spaced from said bracket to a second axial position adjacent thereto; and,

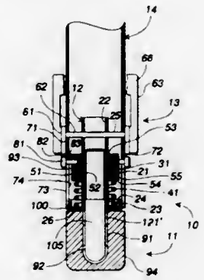
(b) a locking clip removably mounted upon said shank of said bolt between said locking arm of said bolt and said bracket in said first axial position of said bolt, whereby, when said clip is mounted upon said bolt, said clip restricts the axial movement of said bolt from said first axial position by its abutment against said bracket.

5,586,794

RESEALABLE FASTENING DEVICE

Woodrow C. Stillwagon, 7610 Ball Mill Rd., Atlanta, Ga. 30350

Filed Dec. 21, 1994, Ser. No. 361,429
Int. Cl.[6] E05C 19/00
U.S. Cl. 292—252 5 Claims



1. A latching assembly comprising

a rigid stud member (121, 121') having a free end,

a retention surface (102, 102') adjacent to the other end of the stud member,

a tubular support housing (14, 14') enclosing at least partially a fastening device (10) including a cylindrical shell (12) having an axial passage (22) for receiving said stud member through one end thereof, and a plurality of radial openings (21) provided in said cylindrical shell and arranged in circumferentially spaced relationship,

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a plurality of hardened balls (31) disposed in said radial openings of said shell and movable under the influence of said cylindrical shell,

a spring retention shoulder (24) associated with said cylindrical shell at said one end of said cylindrical shell,

a compression spring (41) positioned about said cylindrical shell and supported on said retention shoulder (24),

a pressure ring (51) slidingly disposed about said cylindrical shell and having a pressure application surface (54) in contact with said compression spring,

means for moving said pressure ring from a first to a second position with respect to said cylindrical shell and maintaining said ring in either position,

said pressure ring having an interior cam surface comprising a portion adjacent said pressure surface which is parallel to said cylindrical shell and a portion which is outwardly tapered,

whereby said pressure ring, when in said first position, forces said hardened balls to impinge on said stud member, and, when in said second position, releases said balls so that the stud member may be removed from said cylindrical shell or inserted therein.

5,586,795

EMBEDDED-TYPE HANDLE ASSEMBLY

Shunji Sasaki, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan

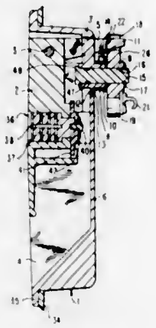
Continuation of Ser. No. 191,811, Feb. 3, 1994, abandoned.

This application Aug. 30, 1995, Ser. No. 521,015

Claims priority, application Japan, Mar. 1, 1993, 5-013637 U

Int. Cl.[6] E05B *3/00*

U.S. Cl. 292—336.3 **6 Claims**



1. An embedded-type handle assembly, comprising:

a casing (1) having side walls (4) and a bottom wall (6);

a handle (2) having a base-end portion which is pivoted to the side walls (4) of said casing (1) through a cross pivot (3) so as to be received in said casing (1), said handle (2) being provided with an operating-foot plate (5) in a rear surface of said handle base-end portion, which plate (5) projects from said rear surface to pass through a through-hole (7) of the bottom wall (6) of said casing (1), said bottom wall (6) having a cylindrical bearing portion (8) projected outwardly from a rear surface of the bottom wall (6);

a shaft (9) rotatably inserted in said cylindrical bearing portion (8) of said casing (1);

a spring (14) encircling said cylindrical bearing portion (8) and arranged for biasing said handle (2) toward its embedded position within said casing (1);

a link plate (18) provided with a circular hole (16) through which said link plate (18) is mounted on a front-end portion of said shaft (9) in an insertion manner, said link plate (18) being prevented from dropping off of said shaft (9);

a first lock bar (20) having its base-end portion connected with one end portion (19) of said link plate (18) through a pivot (27);

a second lock bar (23) having its base-end portion connected with the other end portion (22) of said link plate (18) through a pivot (28); and

said link plate (18) being provided with a follower surface (25) in a side surface of the other end portion (22), so that said follower surface (25) can be pushed by said operating-foot plate (5) of said handle (2) to rotate said link plate (18) and move said first and second lock bars (20, 23).

5,586,796

REINFORCING DEVICES FOR DOORS AND DOOR FRAMES

Paul E. Fraser, 501, Valcartier, Loretteville, Quebec, Canada

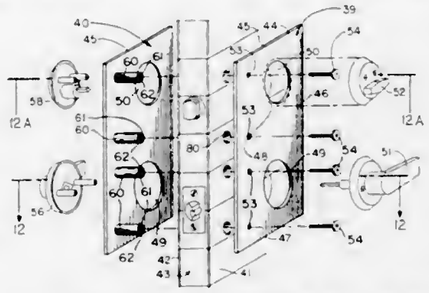
Continuation of Ser. No. 998,461, Dec. 30, 1992, abandoned.

This application Feb. 21, 1995, Ser. No. 393,924

Claims priority, application Canada, Dec. 30, 1991, 2058615

Int. Cl.[6] E05B *17/00*

U.S. Cl. 292—346 **20 Claims**



1. A reinforcement device for a door, the door comprising interior and exterior parallel surfaces and also comprising at least one door control device of at least one bolt, dead or live, the bolt extending through a side of the door joining the two previous parallel surfaces thereof, said reinforcement device comprising a pair of distinct inner and outer reinforcing plates having inner flat sides adapted to be positioned substantially opposite one to the other respectively on the interior and exterior surfaces of the door and close to the side of the door carrying the bolt, each one of said plates defining at least a first opening intended to receive the control device of the bolt, mounting means being provided for connecting said plates together, said mounting means for extending through the door substantially along the thickness thereof, said reinforcement device thus reinforcing the door at least around the bolt; wherein said mounting means comprise at least one element mounted to said outer plate, said element extending towards said inner plate and adjacent thereto, and attachment means adapted to connect said inner plate to said element with said element and said attachment means for being at least partly received in at least a second opening defined substantially transversely in the door in such a way that said attachment means urge said inner plate towards said element, thermal break means being provided between said inner plate and said outer plate.

5,586,797

AUTOMOTIVE DOOR ASSEMBLY

Shinichi Hirahara, and Hiroki Morimoto, both of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 508,207

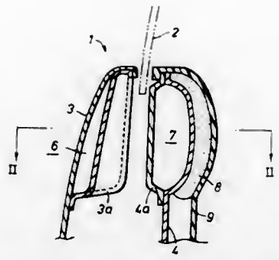
Claims priority, application Japan, Jul. 29, 1994, 6-197320

Int. Cl.[6] B60J *5/04*

U.S. Cl. 296—146.6 **7 Claims**

1. An automotive door assembly, comprising:

an outer panel;



an inner panel opposing said outer panel, said inner panel presenting a concave surface toward said outer panel as seen in vertical cross section; and

an inner reinforcement means, made of a plate member attached to an internal surface of said inner panel, for presenting a mutually concave surface toward said inner panel as seen in vertical cross section so as to jointly define a closed vertical cross section with said inner panel, said inner panel being more readily deformable than said inner reinforcement means so that upon receiving impact force from said vehicle occupant in a side collision, lateral deceleration or lateral acceleration situation, said inner panel extends in a direction parallel to a longitudinal direction of said inner panel to apply a tensile force to said inner reinforcement means to stretch said inner reinforcement means into a more straightened condition.

5,586,798

CURVED WINDOW GLASS PANEL AND METHOD OF INSTALLING CURVED WINDOW GLASS PANEL ON AUTOMOBILE BODY

Hiroyuki Saegusa, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

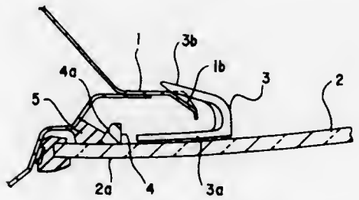
Continuation of Ser. No. 188,413, Jan. 24, 1994, abandoned.

This application Dec. 12, 1995, Ser. No. 571,019

Claims priority, application Japan, Jan. 25, 1993, 5-028681

Int. Cl.[6] B60J *1/18*

U.S. Cl. 296—146.15 **4 Claims**



1. A curved window glass panel for installation on an attachment frame on an automobile body, said automobile body having a window glass attachment frame fixed to said body and having a guide surface fixed to each of opposite ends of said frame, each guide surface having a slant surface, comprising:

a glass panel having a curved center portion; and

a pair of bent end glass portions extending from opposite ends of said center glass panel portion, said attachment frame having a portion extending substantially parallel to each of the bent end portions and one of the slant surfaces extending from each substantially parallel attachment frame portion toward the bent end portion, each of said bent end glass portions having a holder on an inner surface of each of said bent end glass portions for, respectively, engaging said slant guide surface on each said guide surface fixed to a respective opposite end of said attachment frame for guiding each holder on said inner surface of said bent glass portion and said curved window glass panel inwardly into a predetermined position with respect to said attachment frame when said curved window glass panel is pressed against said attachment frame.

5,586,799

UPPER BODY STRUCTURE OF A VEHICLE

Norihiko Kanemitsu; Manabu Tamura, both of Hiroshima; Koh Nakao, Hiroshima-ken; Yukari Kato, Hiroshima; Katsumi Ejima, Hiroshima-ken, and Noboru Yoshii, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

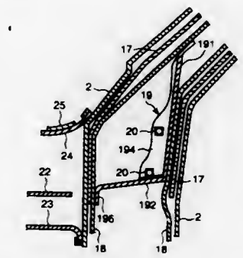
Continuation of Ser. No. 151,392, Nov. 12, 1993, abandoned.

This application Sep. 8, 1995, Ser. No. 524,958

Claims priority, application Japan, Nov. 11, 1992, 4-083576 U

Int. Cl.[6] B62D *25/04*

U.S. Cl. 296—203 **7 Claims**



1. An upper body structure for a car body comprising:

inner and outer front pillar panels forming a hollow front pillar having a vertical lower section and an inclined upper section which is bent rearward from a top of said vertical lower section;

a reinforcement extending inside of the hollow front pillar from the vertical lower section to the inclined upper section for structurally reinforcing a part of the hollow front pillar, said reinforcement including a front inner surface portion, a side wall inner surface portion and a rear inner surface portion; and

a gusset, disposed entirely inside of a space defined by said front inner surface portion, said side wall inner surface portion, said rear inner surface portion and an outer surface of the inner front pilar panel, having a wall extending in said space approximately vertically so that said wall abuts with said rear inner surface portion in said vertical lower section and said front inner surface portion in said inclined upper section so as to divide the space into front and rear sections.

5,586,800

HIGH CHAIR TRAY

Kelvin N. Triplett, 11304 E. 16th Ave., Spokane, Wash. 99206

Filed Oct. 3, 1995, Ser. No. 535,776

Int. Cl.[6] A47B *83/02*

U.S. Cl. 297—148 **9 Claims**

1. A high chair tray, comprising:

a tray assembly having an top surface and a bottom surface, said tray assembly including a forward tray component and a rearward tray component divided by a lateral separation line, said forward tray component and said rearward tray component disposed in coplanar relationship;

a left and a right track member extending forwardly from said rearward tray component, said left track member and said right track member permanently and slidably secured to said forward tray component, said left track member and said right

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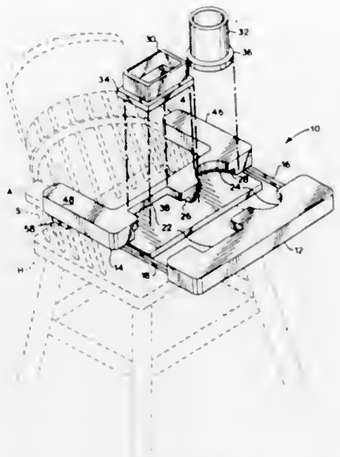


track member slidably connecting said forward tray component and said rearward tray component together;

at least one container receptacle included in said tray assembly and divided substantially equally said lateral separation line, said at least one receptacle including a rim protruding from said top surface of said tray assembly around said at least one container receptacle;

a plate underlying said bottom surface of said tray assembly, said plate extending from said rearward tray component forwardly under said at least one container receptacle, said plate and said rim defining a peripheral channel surrounding said at least one container receptacle, whereby;

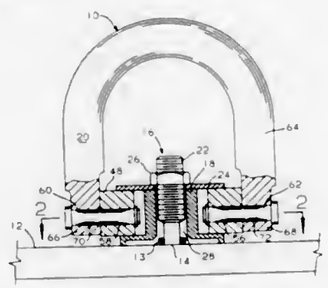
at least one container including flanges adapted to be positively secured within said at least one container receptacle placed on said plate is securable to said tray assembly by slidably closing said forward and rearward tray components together along said left and right track members to secure the container positively within said tray assembly by said peripheral channel surrounding said at least one container receptacle.

5,586,801

STUD MOUNTED HOIST RING

David R. Sawyer, Smithfield, and Douglas M. Wheeler, Newport News, both of Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Oct. 27, 1994, Ser. No. 329,929
Int. Cl.[6] B66C *1/66;* **F16G** *15/08*
U.S. Cl. 294—1.1 **6 Claims**



1. A hoist ring assembly for attachment to a load lifting point comprising:

a welding stud having a free end, a threaded shank, and a second end for welding to a load lifting point;

a bushing concentric with said welding stud;

a ring assembly in rotating and swivel engagement with said bushing;

a locking nut threadably engaged on said stud for holding said bushing against said lifting point;

a flat washer disposed on said welding stud between said bushing and said locking nut;

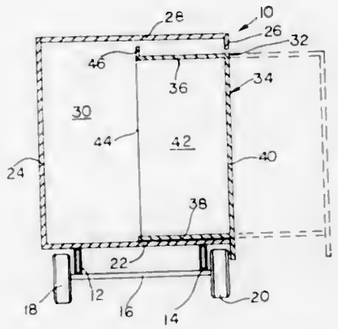
said bushing further comprising a bearing flange at one end for bearing engagement with the load lifting point and a sleeve at the other end, said bearing flange having an outer cylindrical surface and a plurality of inner cylindrical surfaces, said inner cylindrical surfaces being in stepped relationship with each other, said steps being formed by the diameter of one of said inner cylindrical surfaces being larger at an end of said flange in bearing engagement with said load lifting point and the diameter of the other of said inner cylindrical surfaces being smaller at an end of said flange adjacent said sleeve end, and at least said smaller diameter inner cylindrical surface having a chamfer.

5,586,802

LINKAGE FOR GUIDING A RETRACTABLE ROOM

James E. Dewald, Jr.; Martin P. McManus, and Patrick W. McManus, all of 1023 W. Eighth St., P.O. Box 703, Mishawaka, Ind. 46544

Filed May 11, 1995, Ser. No. 438,765
Int. Cl.[6] B60R *27/00*
U.S. Cl. 296—26 **12 Claims**



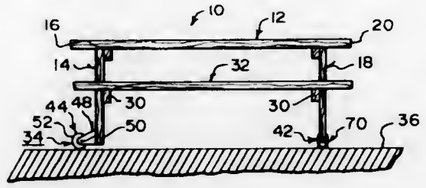
1. Mobile living quarters comprising a main frame including a pair of main frame members, an axle mounted on said main frame members, a pair of wheels mounted on said axle, main living area defining means including a main floor mounted on said main frame members and walls extending from said floor for defining a main living area, a retractable room mounted for movement in a direction substantially parallel to said main floor from a retracted position retracted into said main living quarters to an extended position extended from said main living area to provide an auxiliary living area, said retractable room including a subframe member facing one of said main frame members and extending substantially parallel thereto, a linkage connected between said one main frame member and said subframe member for guiding said retractable room during extension and retraction thereof, said linkage having a pair of arms, each of said arms having opposite ends, first pivot means securing one end of one of said arms to said main frame and one end of the other arm to said retractable room, second pivot means securing one end of said one arm to said retractable room and the other end of said other arm to said main frame, and actuating means for moving said retractable room between said retracted and extended positions.

5,586,803

PORTABLE PICNIC TABLE

Willard T. Overpeck, 171 Bellwood Ave., Wellsboro, Pa. 16901

Filed Oct. 14, 1994, Ser. No. 324,402
Int. Cl.[6] A47B *83/02*
U.S. Cl. 297—158.3 **1 Claim**



1. A portable picnic table comprising:

a) a tabletop having first and second ends and a pair of connecting side;

b) a first pair of legs extending downwardly from said first end of said tabletop at an angle, so as to diverge toward the opposite connecting sides of said tabletop;

c) a second pair of legs extending downwardly from said second end of said tabletop at the same angle as said first pair of legs;

d) each said leg of each said pair of legs having a front face facing one connecting side of said tabletop, a back face facing the opposite connecting side of said tabletop, an outer side face facing the adjacent end of said tabletop, an inner side face opposite said outer side face, said faces defining a rectangular cross sectional configuration, in which said side faces are wider than said front and back faces;

e) means comprising a pair of crossbars for maintaining said first and second pair of legs in spaced relationships;

f) a pair of bench boards, each extending between the ends of said crossbars below the opposite sides of said tabletop;

g) means on said outer side faces near bottom ends of said first pair of legs for rolling said first pair of legs along the ground when the second end of said tabletop is lifted up by the hands of a person and then pushed by the hands of the person, said rolling means including a pair of wheel assemblies and means for securing said wheel assemblies to said outer side faces near the bottom ends of said first pair of legs such that said wheels extend a distance below said first pair of legs whereby the first end of said tabletop is supported directly by said rolling means, each wheel assembly including a wheel bracket, an axle carried in said wheel bracket, and a wheel rotatively mounted on said axle, each wheel bracket including a central portion having a plurality of apertures therethrough and a pair of arm portions integral with and extending at a right angle from said central portion, each said arm portion having a hole therethrough at a distal end to receive said axle, each said securing means including a backing plate on each of the inner faces of said first pair of legs, each said backing plate having a plurality of apertures therethrough which align with said apertures in said central portion of one said wheel bracket and apertures formed in each said first leg, and a plurality of bolts extending through the aligned apertures in said bracket, first leg, and said bracket, with a nut engaging each of said bolts to hold said wheel bracket on said first leg;

h) means on the bottom ends of said second pair of legs for raising said second pair of legs off the ground when at rest to compensate for said rolling means on said first pair of legs to maintain said tabletop in a true horizontal level position, said raising means including a pair of foot brackets and means for attaching said foot brackets to the bottom ends of said second pair of legs, each foot bracket comprising a base portion for resting on the ground surface and spaced from a bottom end of each of said second pair of legs and a pair of side portions each integral with and extending at a right angle from said base portion, each fixed and said side portion having a plurality of openings therethrough to accommodate fasteners passing through said openings into said second pair of legs.

5,586,804

BEVERAGE CONTAINER HOLDER FOR A FOLDING CHAIR

Richard H. Burroughs, Green Bay, Wis., assignor to Krueger International, Inc., Green Bay, Wis.

Filed Jun. 19, 1995, Ser. No. 492,236
Int. Cl.[6] A47C *7/62*
U.S. Cl. 297—188.08 **18 Claims**

16. A folding chair, comprising:

a seat assembly including a frame member and a seat mounted to the frame member, the seat defining a peripheral edge;

a hack assembly;

wherein the seat assembly and the back assembly are collapsibly interconnected with each other for providing movement of the seat and the back assemblies between a collapsed, storage position and an open, use position;

a beverage container holder assembly, comprising a mounting member mounted to the seat assembly, and a container holder member including an outer container holding portion and an inner mounting portion movably secured to the mounting member for providing pivoting movement of the container holder member between a storage position in which a majority of the outer container holding portion is located inwardly of the seat peripheral edge, and an operative position in which the container holding portion is located outwardly of the seat peripheral edge; and

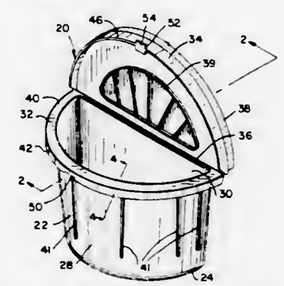
wherein the frame member and the seat cooperate to define a downwardly facing recess within which the mounting member is located.

5,586,805

PORTABLE COMBINATION SEAT AND CONTAINER

John R. Rinehart, Milton, Wis., assignor to American Institute of Taxidermy, Inc., Janesville, Wis.

Filed Jul. 26, 1994, Ser. No. 280,497
Int. Cl.[6] A47C *9/00*
U.S. Cl. 297—188.09 **13 Claims**



1. A seat-container capable of use with a generally cylindrical bucket having a circular bucket rim bounding the interior of the bucket surface, comprising:

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a receptacle having a bottom, a flat sidewall joined to the bottom, a curved sidewall joined to the bottom and the flat sidewall, a rim having a straight portion at the top of the flat sidewall and a semicircular portion at the top of the curved sidewall, the rim including a receptacle flange extending outwardly from the curved sidewall which is capable of supporting the receptacle on the bucket rim when the receptacle rests within a portion of the interior of the bucket, and further including a ridge which extends downwardly from an outer edge of the receptacle flange, the bottom, sidewalls and rim integrally formed of plastic;

a lid seat having a semicircular shape with a straight edge, and an integral hinge connecting the straight edge of the lid seat to the straight portion of the receptacle rim, the lid seat sized so that when the lid seat is in a closed position on the receptacle it extends over the rim flange of the receptacle to be firmly supported about the periphery of the lid seat by the rim of the receptacle such that the lid seat will support an individual seated on the lid seat wherein the lid seat includes a ridge which extends downwardly from a curved outer edge of the lid seat such when the lid seat is in the closed position, the ridge the lid seat extends downwardly closely adjacent to the ridge on the receptacle flange; and

wherein the receptacle, the hinge, and the lid seat are integrally formed of plastic such that the hinge is defined by a region of plastic which is thinner than the plastic forming the receptacle and lid seat.

5,586,806

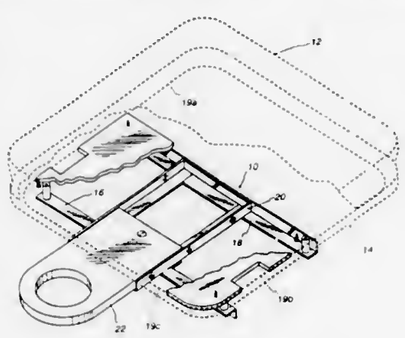
UNDERSEAT ARTICLE HOLDER APPARATUS

Arthur Hergott, Deerfield, Ill., assignor to Greenwich Industries, L.P., Lake Bluff, Ill.

Filed Nov. 21, 1995, Ser. No. 561,437

Int. Cl.[6] A47C *7/62*

U.S. Cl. 297—188.11 **22 Claims**



12. A seating apparatus comprising:

a seat having laterally spaced sides;

a guide mounted to the seat;

a carriage supported by the guide for movement in a first path between the laterally spaced sides; and

a receptacle holder supported by the carriage for movement in a second path transverse to the first path;

the seat includes a substantially flat bottom surface and the guide includes a pair of longitudinally spaced rails extending between the laterally spaced sides and spaced from the bottom surface with the carriage mounted between the rails and the bottom surface for movement in the first path;

the carriage comprising a frame having a pair of spaced legs and a base, the receptacle holder comprises a substantially planar elongate member located between the spaced legs of the carriage and the substantially planar elongate member moves along the spaced legs in the second path; and

the substantially planar elongate member comprising a forward end and a rearward end, the forward end adapted to hold an article, the substantially planar elongate member further being movable between a retracted position with the receptacle holder generally beneath the bottom surface of the seat and the rearward end being adjacent to the frame of the carriage, and an extended position with the forward end extending outwardly from beneath the bottom surface of the seat to expose the receptacle holder forward end to hold an article, and the rearward end being spaced from the frame of the carriage.

5,586,807

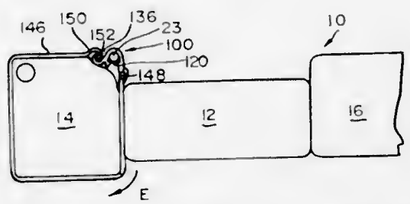
VEHICLE SEAT TRIM COVER RETAINER

Russell C. Taggart, White Lake, Mich., assignor to Atoma International Of America, Inc., Livonia, Mich.

Filed Feb. 10, 1995, Ser. No. 386,417

Int. Cl.[6] A47C *31/02*

U.S. Cl. 297—218.5 **8 Claims**



1. A trim cover of a vehicle seat in combination with a retainer for securing first and second ends of the trim cover to a portion of a frame of the seat such that said first and second trim cover ends are in generally adjacent relation when the retainer is fixed to the frame portion, the retainer comprising:

a first elongate body having a base portion and first and second arms extending in spaced relation from said base portion defining a first, open-ended channel therebetween;

a second elongate body having a base portion and first and second arms extending in spaced relation from said base portion of said second body defining a second, open-ended channel therebetween, said second arm of said second body being coupled to said first body in such a manner that (1) a longitudinal axis of said first body is in parallel relation with a longitudinal axis of said second body and (2) an open end of said first channel is oriented at an angle of at least 180° with respect to an open end of said second channel; and

a planar portion extending from said first arm of said first body in parallel relation with said second arm of said first body, said first end of said trim cover being attached to said planar portion.

said first channel being constructed and arranged to receive said frame portion so as to be in secured relation therewith, said second channel being constructed and arranged to receive said second end of said trim cover.

5,586,808

CHAIR WITH LATERAL FRAME PARTS CONNECTED BY TRANSVERSE RODS SUPPORTING SEAT AND BACKREST

Frank Oelke, Eichgrabenstr. 14a, D-82340 Feldafing, Germany

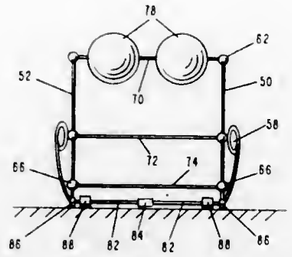
Filed Apr. 21, 1995, Ser. No. 426,040

Claims priority, application Germany, Apr. 22, 1994, 44 14 120.3; Dec. 10, 1994, 44 44 047.2

Int. Cl.[6] A47C *5/10*

U.S. Cl. 297—287 **12 Claims**

1. A chair comprising:



two lateral frame parts, each one of said frame parts comprised of a single, continuous member of an elastically yielding material;

transverse rods connected between said lateral frame parts;

a seat connected to at least one of said transverse rods; and

a backrest connected to at least one of said transverse rods; and

wherein each one of said single members of said lateral frame parts has an upper rearward end, a lower rearward end, and a floor-contacting portion, wherein each one of said single members is curved continuously at a first radius of curvature from said upper rearward end forward and downward, then rearward and downward to said floor-contacting portion, from said floor-contacting portion upward and rearward, and then with an arc of a second radius of curvature, substantially smaller than said first radius of curvature, downward and rearward to said lower rearward end, wherein an end portion of said single member, positioned between said lower rearward end and said arc, extends straight downward and rearward at a slant.

5,586,809

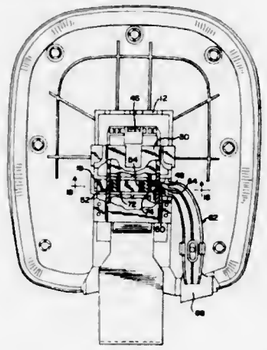
HEIGHT ADJUSTMENT MECHANISM FOR A CHAIR BACKREST

John A. Szmadzinski, Muskegon, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Aug. 4, 1995, Ser. No. 511,612

Int. Cl.[6] B60N *2/02*

U.S. Cl. 297—353 **25 Claims**



8. An adjustment mechanism for releasably retaining a backrest in a plurality of selected positions relative to a seat, the adjustment mechanism comprising:

a channel member adapted to be rigidly secured to the backrest;

a support member slidably received by said channel member and adapted to be rigidly secured to the seat;

a first plurality of vertically aligned rack teeth extending in a generally lateral direction from the support member;

a second plurality of vertically aligned rack teeth extending from the support member in the same direction as the first plurality of rack teeth, said second plurality of rack teeth being spaced apart from and generally parallel to said first plurality of rack teeth;

a catch having spaced apart, horizontally aligned, first and second pawls extending in the opposite direction as the first and second plurality of rack teeth, said catch being slidably mounted to one of the channel member and the support member, wherein actuation of the catch causes movement thereof in a linear, horizontal direction to simultaneously selectively engage the first and second pawls with the respective first and second plurality of rack teeth; and

a spring acting against the catch for biasing the first and second pawls into engagement with the first and second plurality of rack teeth;

whereby the backrest is retained from falling downwardly from a desired vertical position by the engagement of the first and second pawls with the first and second plurality of rack teeth.

5,586,810

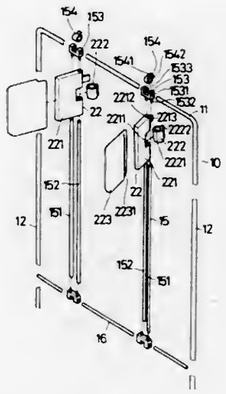
ADJUSTABLE HEADREST

Yang-Ting Liu, P.O. Box 82-144, Taipei, Taiwan

Filed Feb. 12, 1996, Ser. No. 599,847

Int. Cl.[6] H47C *7/36*

U.S. Cl. 297—406 **2 Claims**



1. A headrest comprising:

two vertical rods;

an upper horizontal rod connected between upper ends of said two vertical rods;

a lower horizontal rod connected between lower ends of said two vertical rods;

a pair of vertical supporting means arranged between said upper and lower horizontal rods and including a positioning rod and a guiding rod;

a first pair of sliders slidably mounted on said upper horizontal rod and having a recess at an intermediate portion and two pins at a bottom thereof adapted to engage with upper ends of said positioning rod and guiding rod;

a second pair of sliders slidably mounted on said lower horizontal rod and having a recess at an intermediate portion and two pins at a bottom thereof adapted to engage with lower ends of said positioning rod and guiding rod;

a first pair of cylindrical members each fitted in said recess of said first pair of sliders and having a lug and an eccentric hole receiving said upper horizontal rod;

a second pair of cylindrical members each fitted in said recess of said second pair of sliders and having a lug and an eccentric hole receiving said lower horizontal rod;

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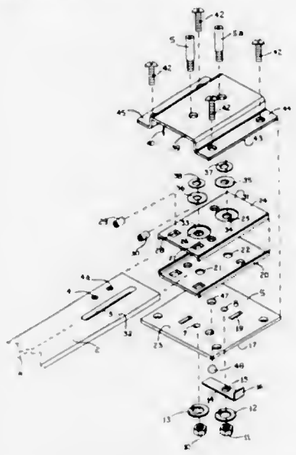
a pair of panels each slidably mounted on said guiding rod and having a cavity and a projection plate; and

a pair of cylinders each fitted in said cavity and having an eccentric hole receiving said guiding rod.

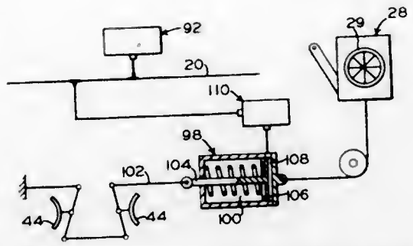
5,586,811
ADJUSTMENT DEVICE FOR CHAIR ARMS
Lino E. Tornero, 809 Quailmeadow La., Colfax, N.C. 27235
Filed Aug. 15, 1994, Ser. No. 289,578
Int. Cl.[6] A47C *7/54*
U.S. Cl. 297—411.36 **8 Claims**



1. An adjustment device comprising: a structural member, said structural member defining a slot, a support member, said support member in contact with said structural member, a retaining member, said support member and said retaining member encasing said structural member therebetween, a detente element, said detente element contacting said structural member for selective adjustable movement of said structural member along said support member, bushing means, said bushing means defining a guide post aperture, a guide post, said guide post passing through said guide post aperture, a friction element, said friction element contacting said bushing means and said structural member to slightly retard the movement of said structural element, said bushing means defining a receiving cavity, said receiving cavity for reception of said frictional element.

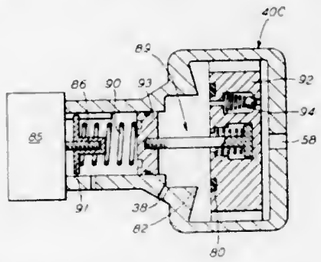
5,586,812
RAILWAY BRAKING APPARATUS
Wajih Kanjo, Lockport, Ill.; Eric Smith, Burlington, Canada; Thomas J. Demoise, Export, Pa.; Michael Girotti, Thorold; Thomas McCabe, Dorval, both of Canada; Charles B. Fessler, Lancaster, Pa., and Scott Natschke, Kankakee, Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Division of Ser. No. 278,937, Jul. 22, 1994. This application Jun. 7, 1995, Ser. No. 477,470
Int. Cl.[6] B60T *13/00*
U.S. Cl. 303—7 **4 Claims**

1. A parking brake release system for a railway vehicle having a first conduit for fluid pressure, service brakes actuated by fluid pressure in such first conduit such that an increase in said fluid pressure causes release of such service brakes, and a reduction of said fluid pressure causes application of such service brakes, an auxiliary parking brake apparatus, means for manually actuating



such auxiliary parking brake apparatus to a braking condition, said parking brake release system comprising a parking brake cylinder biased to a braking position by mechanical means when such auxiliary parking brake apparatus has been manually actuated, said parking brake cylinder responsive to such increase in said fluid pressure in such first conduit to configure said parking brake cylinder to a brake release position and wherein said reduction of said fluid pressure causes application of such auxiliary parking brake appraratus.

5,586,813
ELECTRO-PNEUMATIC FREIGHT BRAKE CONTROL SYSTEM
Albert A. McKay, Stoney Creek, and Eric G. Smith, Burlington, both of Canada, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Apr. 27, 1995, Ser. No. 429,450
Int. Cl.[6] B60T *8/18*
U.S. Cl. 303—22.4 **3 Claims**



1. A railroad car brake control system comprising:

a) a source of fluid under pressure;

b) a brake cylinder device;

c) application and release control valve means interposed between said brake cylinder device and respective ones of said source of fluid under pressure and atmosphere;

d) electric communication means for conducting a brake command signal;

e) processor means for establishing and interrupting electrical communication between a source of electric power and said application and release control valve means in accordance with said brake command signal, said application and release control valve means in a deenergized condition establishing communication between said source of fluid under pressure and said brake cylinder device;

f) electric load sensing means for providing a car load signal corresponding to the load weight of said car; and

g) pressure limiting valve means interposed between said application and release control valve means and said brake cylinder device, and subject to said car load weight signal for setting a maximum pressure limit above which the fluid pressure at said brake cylinder device is cut-off from said source of fluid under pressure, and for retaining the setting of

said maximum pressure limit following a loss of said car load weight signal, wherein said limiting valve means includes:

(i) an inlet connected to said application and release valve means;

(ii) an outlet;

(iii) a proportioning valve assembly including:

(a) a differential area piston abutment;

(b) a supply valve carried on said differential area piston abutment via which fluid under pressure effective at said input is connected to said outlet;

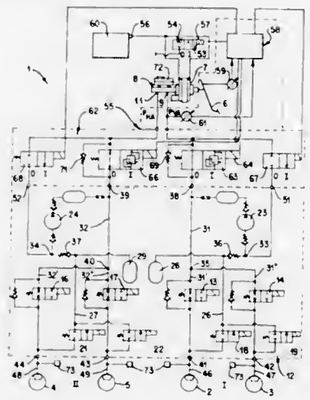
(c) a load responsive piston connected to said differential area piston abutment and subject on one side to the fluid under pressure supplied to said inlet; and

(iv) a non-rotatable spring seat spaced from the other side of said load responsive piston;

(v) a proportioning spring in the space between said other side of said load responsive piston and said spring seat;

(vi) electric motor means subject to said car load weight signal and having a screw-threaded output shaft threadedly engaged with said spring seat for adjusting the degree of compression of said spring in accordance with the degree of rotation of said output shaft, the degree of rotation of said output shaft being dependent on said car load weight signal, the fluid pressure effective at said outlet when said car load weight signal is absent in consequence of a loss of said source of electric power corresponding to said maximum pressure limit.

5,586,814
BRAKING PRESSURE CONTROL DEVICE WITH MAXIMUM VEHICLE DECELERATION DURING AUTOMATIC BRAKING
Manfred Steiner, Winnenden, Germany, assignor to Mercedes-Benz AG, Germany
Filed Aug. 30, 1994, Ser. No. 299,009
Claims priority, application Germany, Aug. 30, 1993, 43 29 140.6
Int. Cl.[6] B60T *8/60;8/40;8/48*
U.S. Cl. 303—116.2 **7 Claims**



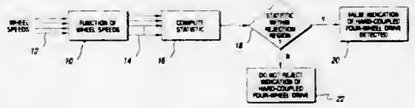
1. Braking pressure control device for a motor vehicle with hydraulic multi-circuit brake systems with static brake circuits, comprising a master cylinder constituting a braking device with separate pressure outlets associated with each of said brake circuits; a pneumatic braking force amplifier coupled to said master cylinder and a brake pedal coupled to said pneumatic braking force amplifier, the brake pedal actuating the master cylinder through said amplifier; said amplifier having a drive chamber movably delimited by a piston between a permanent low-pressure chamber maintained at a low pressure, whose charging with a pressure monotonically correlated with pressure on the brake pedal is controllable by which a deliberate brake application occurs; an auxiliary force valve coupled to the amplifier and which switchably causes exposure of the low-pressure chamber to a pressure equal to or greater than atmospheric pressure, this exposure causing a high actuating force sufficient for a full brake application to be deployed; an electronic control unit having an output signal coupled to the auxiliary force control valve to control the triggering of the switching of the auxiliary force control valve, the electronic control unit generating said output signal when the speed or the rate of change of the force with which the driver actuates the brake pedal exceeds a threshold value; an electronically controllable antilock brake system (ABS) coupled to and acting on the individual brake circuits by feedback, and having inlet and outlet valves associated individually with the wheel brakes; electrically drivable feedback pumps individually associated with the brake circuits and having a high output pressure level, wherein said pumps, in a pressure-reduction phase of antilock brake regulation resulting from the antilock brake system, recycle into a main brake line of the respective brake circuit the brake fluid released into a return line of the respective brake circuit;

a separate electrically controllable switching valve for each of the brake circuits, said valve being switchable from a functional position connecting the main brake line of the respective brake circuit with the respective pressure outlet of the braking device, into a functional position shutting off the respective pressure outlet from the respective main brake line; and

electrically controllable precharging control valves associated with the respective brake circuits and operatively arranged between the braking device and the ABS such that an outlet of each precharging control valve is connected solely with a line leading to the low pressure inlet of the respective return pump switchable from a functional position shutting off the respective pressure outlet of the braking device from a low-pressure inlet of a return pump of the respective brake circuit, into a functional position connecting the respective pressure outlet with the low-pressure inlet of the respective return pump whereby the braking device-precharges the return pumps and is employable to provide slip regulation as a function of wheel speed;

wherein the electronic control unit includes sensor inputs configured to receive sensor output signals representing at least one of the actuation of the brake pedal and the dynamic behavior of the motor vehicle, the electronic control unit generating signals required for automatic operation of the brake system at a high braking pressure level, for controlling the switching valves, the precharging control valves, the return pumps and the inlet and outlet valves of the antilock brake system and the auxiliary force control valve.

5,586,815
METHOD AND SYSTEM FOR DETECTING FALSE FOUR-WHEEL DRIVE INDICATION IN ANTILOCK BRAKE SYSTEMS
Dan Negrin, Wiesbaden, Germany, assignor to Kelsey-Hayes Company, Livonia, Mich.
Filed Sep. 9, 1994, Ser. No. 303,389
Int. Cl.[6] B60J *8/00*
U.S. Cl. 303—143 **27 Claims**



1. A method for detecting an incorrect indication of four-wheel drive operation of a vehicle, the vehicle having a front axle with two front wheels and a rear axle with two rear wheels, the vehicle capable of both four-wheel drive operation where the front and rear axles are locked together and operation where the front and rear

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axles are unlocked, the vehicle further having an antilock brake system and means coupled to the antilock brake system for indicating four-wheel drive operation, the method comprising the steps of:

(a) generating a first speed signal representative of a speed of at least one wheel on the front axle;

(b) generating a second speed signal representative of a speed of at least one wheel on the rear axle;

(c) calculating a decision value based upon the first and second speed signals; and

(d) detecting an incorrect indication that the vehicle is in four-wheel drive operation when the decision value is within a rejection region.

5,586,816

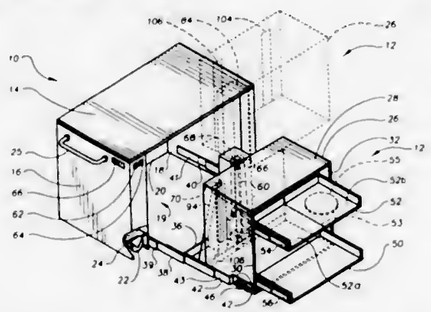
MULTI-PURPOSE, MOBILE STORAGE CABINET WITH HORIZONTALLY AND VERTICALLY ADJUSTABLE SHELF STRUCTURE

Michael J. Geiss, II, 531 Oak St., Syracuse, N.Y. 13203

Continuation-in-part of Ser. No. 119,485, Sep. 13, 1993, abandoned, and Ser. No. 911,090, Jul. 9, 1992, abandoned. This application Jun. 19, 1995, Ser. No. 492,240

Int. Cl.[6] A47B *83/00*

U.S. Cl. 312—301 **27 Claims**



1. A combination cabinet and shelf structure comprising:

a) an outer cabinet having a top, planar surface and at least one support leg extending therefrom adapted to position and support said top surface a predetermined distance above a substantially planar floor surface;

b) a shelf structure comprising:

i) a platen;

ii) an inner cabinet of generally rectangular configuration having a top, bottom and opposite side walls extending between said top and bottom walls to define an open front, said bottom wall mounted in covering relation to said platen; and

iii) at least one shelf slidably mounted to said inner cabinet within said open front between said side walls, said shelf being slidingly movable between a stored position beneath said top wall in said open front, and an extended position spaced forwardly of and adjacent said open front, said shelf lying in a plane spaced and parallel to said top and bottom walls;

c) horizontal adjusting means connected to and between said outer cabinet and said platen, said horizontal adjusting means operable to horizontally move said platen and said inner cabinet between a stored position with said platen and inner cabinet positioned beneath said outer cabinet top surface, and an extended position with said platen and inner cabinet positioned forwardly of and adjacent to said outer cabinet; and

d) vertical adjusting means connected to and between said platen and said inner cabinet, said vertical adjusting means operable to vertically move said inner cabinet and said at least one shelf between a fully lowered position with said inner cabinet bottom wall lying in covering relation to said platen, and a fully raised position with said inner cabinet bottom wall positioned a predetermined distance above said platen.

5,586,817

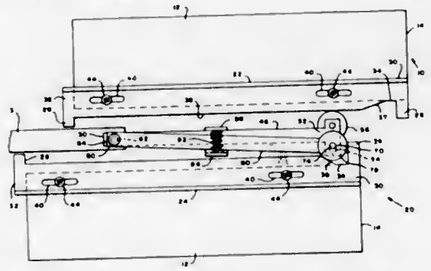
DRAWER INTERLOCK APPARATUS

David Hubbard, Stamford, and Walter Wolog, Orange, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 5, 1995, Ser. No. 523,728

Int. Cl.[6] A47B *88/00*

U.S. Cl. 312—334.44 **5 Claims**



1. A pair of drawers having a drawer interlock apparatus, each of the drawers including opposite side walls, a rear wall, and a front panel, the interlock apparatus comprising:

a frame;

a pair of longitudinal rails, each rail mounted to a side wall of each drawer, each rail including a front end and a rear end, a pair of substantially L-shaped stop means, one of the pair of stop means being situated at the front end of the rail, the other of the pair of stop means being situated at the rear end of the rail, and a locating notch having an angled surface positioned between the stop means; and,

locking means pivotally mounted to the frame, the locking means further being slideably engaged with the rail of each drawer for preventing the simultaneous extension of the pair of drawers wherein the locking means comprises:

a pair of link mechanisms having a first end pivotally mounted to the frame, one of the pair of link mechanisms having a substantially T-shaped opposite end including an elongated slot, the other of the pair of link mechanisms having a pin fixedly mounted at an opposite end for engaging the elongated slot;

a spring interposed between the pair of link mechanisms; and roller means rotatably mounted to the opposite end of each link mechanism and fitting into the locating notch, the roller means being engaged with the rail of each drawer so that as the roller means move toward the rear end of one of the pair of drawers, the spring compresses and the pin engages the elongated slot thereby prohibiting movement of the roller means engaged with the other of the pair of drawers.

5,586,818

THREE DIMENSIONAL PROJECTION SYSTEM

Dong-Hee Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 14, 1996, Ser. No. 601,437

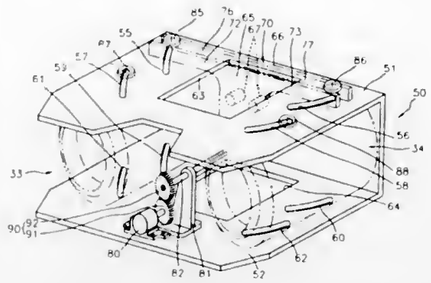
Claims priority, application Rep. of Korea, Feb. 15, 1995, 95-2741

Int. Cl.[6] G03B *21/00;* **G02B** *7/04*

U.S. Cl. 353—101 **11 Claims**

1. A three dimensional projection system comprising:

a holder housing having an upper plate and a lower plate, a plurality of longitudinally inclined guiding holes symmetrically formed at both sides of said upper and lower plates and



inclined at predetermined angles about central axes of said upper and lower plates, and first and second opening portions, said first and second opening portions being formed in rear central portions of said upper and lower plates, respectively;

first and second projecting lens holders having cylindrical shapes and being provided with projecting lenses formed in front sides thereof, said holders being arranged in parallel in said holder housing;

movable pins protrusively formed on upper and lower portions of said first and second projecting lens holders, said movable pins being respectively inserted into corresponding longitudinally inclined guiding holes;

a holder supporting plate having a pair of front and rear plates and a spacer for maintaining a distance between said front and rear plates, said front and rear plates being provided with a first and a second leg portions formed at both sides thereof and extended through said first opening portion onto an upper portion of said upper plate, and a third and fourth leg portions extended through said second opening portion onto a lower portion of said lower plate, guiding grooves being formed at said leg portions for said movable pins being inserted therein-into;

driving means for supplying driving power for transporting said projecting lens holders forward and backward; and

transporting means for transporting the driving power supplied from said driving means to said projecting lens holders.

5,586,819

FLASHLIGHT

David J. Bamber, Wichita, Kans.; Benson Leung, and Vincent Leung, both of Kowloon, Hong Kong, assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Nov. 8, 1994, Ser. No. 334,429

Int. Cl.[6] F21L *7/00*

U.S. Cl. 362—158 **4 Claims**

1. A flashlight comprising:

a battery housing having a generally cylindrical side wall having an open top end, an inner surface, an outer surface, and a bottom wall, the outer surface of the side wall having male threads adjacent the top end of the battery housing,

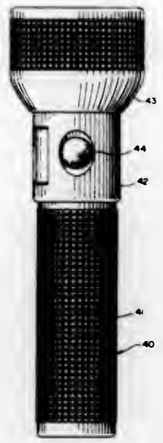
a generally cylindrical switch housing having a generally cylindrical side wall having open top and bottom ends and inner and outer surfaces, the inner surface of the side wall of the switch housing having female threads adjacent the bottom end of the switch housing, the outer surface of the side wall of the switch housing having male threads adjacent the top end of the switch housing, the female threads of the switch housing being engaged with the male threads on the battery housing,

a switch mounted in the switch housing,

a bulb holder mounted in the switch housing adjacent the open top end of the switch housing,

a light bulb mounted in the bulb holder,

a head having an outer wall having open top and bottom ends and a generally cylindrical inner wall extending upwardly



from the open bottom end, the inner wall having female threads which are engaged with the male threads on the switch housing,

an O-ring mounted on the outer surface of the battery housing adjacent the male threads on the battery housing, the O-ring on the battery housing providing sliding contact and sealingly engaging the inner surface of the side wall of the switch housing over a range of axial motion of the switch housing relative to the battery housing,

an O-ring mounted on the outer surface of the side wall of the switch housing adjacent the male threads on the switch housing providing sliding contact and sealingly engaging the inner wall of the head over a range of axial motion of the head relative to the switch housing,

a reflector having an open top end which is mounted in the open top end of the head and a reflecting wall which extends downwardly from the open top end of the head toward the inner wall of the bead, the reflecting wall having a central opening through which the light bulb extends, and

a transparent lens mounted in the open top end of the head.

5,586,820

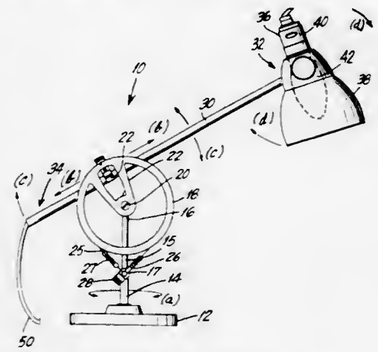
MULTIDIRECTIONAL TASK LAMP

Andrew K. Klink, 865 First Ave., New York, N.Y. 10017

Filed Aug. 22, 1995, Ser. No. 518,049

Int. Cl.[6] F21V *21/18*

U.S. Cl. 362—402 **7 Claims**



1. A multidirectional task lamp comprising:

a base;

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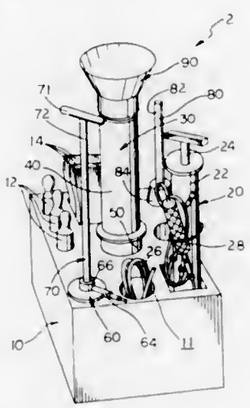
a mounting socket;
a rod;
a tension wheel having an axial opening and a peripheral cleat;
a tubular extension arm including a socket end and a mounting end;
a shaded socket portion;
said mounting socket is disposed on said base;
said rod rotatably extends between said mounting socket and said axial opening;
said cleat includes an opening configured for slidably accepting said tubular extension arm;
said tension wheel is rotatably connected to the rod via a cross bar associated with said rod;
tension means associated with said tension wheel and another cross bar associated with said rod for controlling the rotatability of the tension wheel;
said shaded socket portion is rotatably disposed on said socket end on said tubular extension arm;
an electrical connection is guided through said tubular extension arm to provide an electrical connection to said socket end.

5,586,821

BONE CEMENT PREPARATION KIT

John A. Bonitati; Kirt L. Case, both of Warsaw; Michael E. Hawkins, Columbia City, and Stephen H. Hoag, Warsaw, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Oct. 10, 1995, Ser. No. 541,360
Int. Cl.[6] B01F *13/06*
U.S. Cl. 366—139 **16 Claims**



1. An apparatus for manufacturing bone cement by mixing a plurality of constituent components comprising:

a telecsoping cartridge including a tubular outer cylinder having an open proximal end and a distal end, and a tubular inner cylinder having an open proximal end and a distal end shiftably received within said outer cylinder distal end, said inner cylinder being axially extensible between an extended position, an intermediate position, and a retracted position,

a cap connectable to said outer cylinder proximal end, said cap part including means for connecting said cartridge to a vacuum pump to draw a vacuum within said cartridge when said inner cylinder is in its said extended position,

an end plug, shiftably disposed within said inner cylinder for axial movement within said inner cylinder towards said cap to expel said cement from said cartridge,

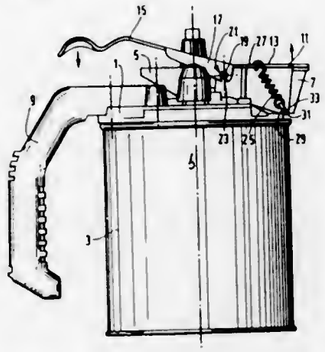
and means for releasing vacuum pressure within said cartridge when said inner cylinder is in its said intermediate position.

5,586,822

STIRRER LID FOR COLOR CANS OF STIRRING MACHINES

Alain Krzywdziak, Orleans, France, assignor to F.A.S., Orleans Cedex, France

Filed Jul. 5, 1995, Ser. No. 498,198
Claims priority, application France, Jul. 5, 1994, 94 08283
Int. Cl.[6] B01F *7/20*
U.S. Cl. 366—247 **8 Claims**



1. A stirrer lid for a color can which is positionable on paint stirring machines, said stirrer lid comprising a raised pouring lip; a sealing element for said pouring lip including shutter means (13, 13') for selectively opening and closing the pouring lip (7); an operating lever (15, 15') mounted on said lid for placing said sealing element into an open position for pouring the contents of the can; a pair of helical springs (25) for biasing said sealing element of the pouring lip into a closed position, said springs being two identical helical springs (25) for returning the sealing element (13, 13') into the closed position, said springs being arranged symmetrically relative to a vertical mid-plane (P) of the stirrer lid, each said spring having an upper end connected to the sealing element (13, 13') and a bottom end connected to a front base of the pouring lip (7) laterally relative to the pouring lip and being oriented downwardly toward the outer edge of the stirrer lid, each spring being connected at the ends thereof to a fastening element (27) on the sealing element and to a lower part of the pouring lip, said springs (25) being each connected at their lower ends to a rod (31) which is engaged and retained in a groove (33) in the front base of the pouring lip (7).

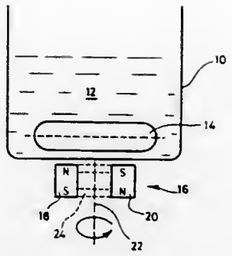
5,586,823

MAGNETIC STIRRING SYSTEM

Anthony H. Carr, Bedfordshire, Great Britain, assignor to Unipath Limited, Basingstoke, England

PCT No. PCT/GB93/01479, § 371 Date Mar. 9, 1995, § 102(e) Date Mar. 9, 1995, PCT Pub. No. WO94/02238, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 14, 1993, Ser. No. 373,254
Claims priority, application United Kingdom, Feb. 17, 1993, 93301171
Int. Cl.[6] B01F *13/08*
U.S. Cl. 366—274 **9 Claims**

1. A magnetic stirrer comprising a bottle unit constituted by a closed culture bottle containing liquid and a gaseous headspace above the liquid, the bottle having a base and a stirrer bar of relatively low power magnetisation establishing opposite poles at opposite ends of the bar and extending parallel to the bottle base within the bottle, and a permanent magnet means of relatively high power providing spaced opposite poles in a plane parallel to the length of the stirrer bar located beneath the bottle base in close proximity thereto, and driving means for continuously rotating the permanent magnet means about an axis substantially normal to the



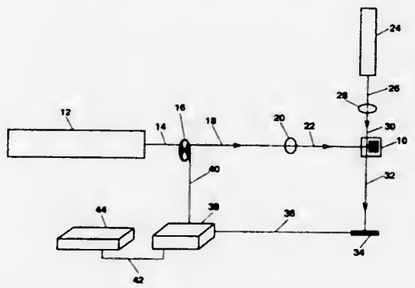
bottle base so that its rotating strong magnetic field aligns with that of the stirrer bar and entrains the stirrer bar in continuous rotation in a plane parallel to and above the bottle base within the liquid in the container, thereby to disturb the liquid surface in order to promote gas exchange with the bottle headspace.

5,586,824

METHOD OF MEASURING THE THERMAL CONDUCTIVITY OF MICROSCOPIC GRAPHITE FIBERS

John Barkyoumb, Beltsville; Lawrence T. Kabacoff, Columbia, and David J. Land, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1994, Ser. No. 260,273
Int. Cl.[6] G01N *25/18*
U.S. Cl. 374—44 **18 Claims**



1. A method of determining the thermal conductivity of a fiber comprising the steps of:

A. suspending a cylindrical sample fiber selected from the group consisting of metal fibers and graphite fibers in a working fluid having a high refractive index change with temperature;

B. heating the sample fiber at a first point by means of a pump laser beam that is modulated at a frequency of less than 200 hertz;

C. passing a weak continuous intensity probe laser beam through the working fluid close to a second point on the sample fiber so that a deflection of the probe beam occurs that is a measure of the amplitude and phase shift of a synchronous thermal wave passing through the second point as a result of the heating of the sample fiber by the modulated pump laser beam;

D. converting the probe laser beam deflection into an electrical signal whose amplitude and phase shift correspond to the amplitude and phase shift of the synchronous thermal wave as it passes through the second point on the sample fiber;

E. recording either the maximum or the RMS amplitude of the electrical signal and the corresponding distance between the first point and the second point on the sample fiber;

F. changing the distance between the first point and the second point on the sample fiber and repeating steps B through E and continuing this procedure until the amplitude of the electrical signal has been measured at a desired number of different distances between the first point and the second point on the sample fiber;

G. determining the straight line slope of a plot of the logarithm of the amplitude of the electrical signal versus the distance between the first point and the second point on the sample fiber;

H. using a mathematical model for the synchronous thermal wave produced in a theoretical uniform cylindrical fiber by a modulated pump laser beam heat source at a first point to calculate the maximum theoretical amplitude of the thermal wave for each of a series of second points along the theoretical uniform cylindrical fiber from inputs which include the modulation frequency of the real pump laser beam used to heat the sample fiber in step B, the actual density, specific heat, and diameter of the sample fiber, the distance of each second point from the first point, on the theoretical fiber, and an initial estimate of the thermal conductivity of the sample fiber which is to be determined;

I. finding the straight line slope of a plot of the logarithm of the maximum theoretical amplitude of the mathematical model thermal wave at each second point on the theoretical fiber versus the distance of the second point from the first point on the theoretical fiber;

J. comparing the straight line slope of the logarithm of the calculated maximum theoretical amplitude of the mathematical model thermal wave versus the distance between the first point and the second point on the theoretical fiber (step I) with the straight line slope of the logarithm of the amplitude of the electrical signal versus the distance between the first point and the second point on the sample fiber (step G) and then adjusting the value of the estimated thermal conductivity to bring the slopes closer together; and

K. repeating steps H through J until the straight line slope of the logarithm of the calculated maximum theoretical amplitude of the mathematical model thermal wave versus the distance between the first point and the second point on the theoretical fiber is the same as the straight line slope of the logarithm of the amplitude of the electrical signal versus the distance between the first point and the second point on the sample fiber, and the value of thermal conductivity last used is the correct one.

5,586,825

Patent Not Issued For This Number

5,586,826

ROLLER BEARING PROVIDED WITH ROLLER SKEW CONTROL AND LONG LIFE CHARACTERISTICS

Magnus Kellström, Partille; Joacim Fogelström, Billdal, both of Sweden, and Henning Wittmeyer, Hilversum, Netherlands, assignors to SKF Sverige AB, Gothenburg, Sweden

Filed Dec. 19, 1994, Ser. No. 358,314
Int. Cl.[6] F16C *19/28*
U.S. Cl. 384—450 **8 Claims**

1. A roller bearing having an axis and comprising an inner member having at least one inner raceway and an outer member having at least one outer raceway, said at least one inner raceway and said at least one outer raceway being spaced apart to define an annular space in which is located a row of rolling elements, said rolling elements being adapted to engage the at least one inner raceway and the at least one outer raceway at respective contact zones, each rolling element having an axis and being positioned at

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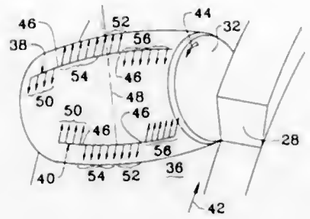


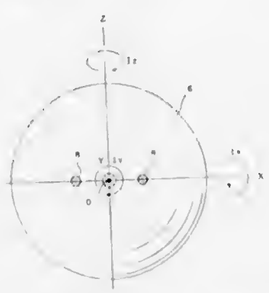
a skew angle when the rolling element axis and the axis of the roller bearing are other than coplanar, said skew angle being positive when axial components of the friction forces acting on the rolling element and arising between the rolling element and either raceway in the respective contact zone are co-directional to an axial component of a normal force carried by the rolling element, and friction producing means for producing frictional coefficients at two spaced apart and separate first locations across a width of at least one of the outer raceway and the inner raceway which is different from a frictional coefficient at a second location disposed between the two first locations, said means for producing said first frictional coefficients at said two first locations being located at positions in which the friction forces acting on the rolling elements contribute to creation of a positive skew moment.

5,586,827

BALL BEARING WITH CONTROLLED DYNAMIC IMBALANCE

Tetsuo Unno; Yoshio Shoda, and Tatsunohu Momono, all of Fujisawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jan. 5, 1996, Ser. No. 583,398
Claims priority, application Japan, Jan. 6, 1995, 7-000463
Int. Cl.[6] F16C *19/00*
U.S. Cl. 384—450 **1 Claim**



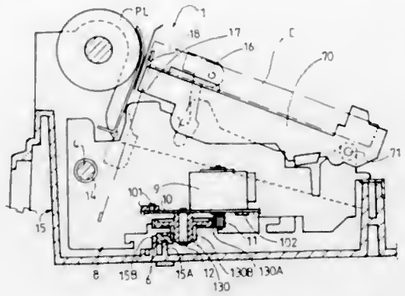
1. A ball bearing comprising a first race ring having a first surface formed with a first race surface thereon, a second race ring having a second surface formed with a second race surface thereon, and a plurality of balls provided so as to be freely rotatable between the first race surface and the second race surface, each of the plurality of balls satisfying the numerical limitations that a ratio $\Delta I/I$ of a dynamic imbalance amount to a moment of inertia I, is less than $(3.1\times10^{7}/(d_m\cdot N)^2)+2.7\times10^{-5}$, when the ball bearing is used under conditions wherein a product $d_m\cdot N$ of a pitch circle diameter d_m mm of the plurality of balls, and a rotational speed N rpm of the second race ring relative to the first race ring is greater than 1,000,000 mm·rpm.

5,586,828

PRINTER WITH PRINTING HAMMER

Takashi Nakata, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 27, 1994, Ser. No. 364,317
Claims priority, application Japan, Dec. 28, 1993, 5-350872
Int. Cl.[6] B41J *23/34*
U.S. Cl. 400—185 **20 Claims**



1. A print mechanism using a type wheel, having a plurality of type elements, the type wheel mounted on a carriage movement mechanism which moves a carriage in a first direction or a second direction opposite to the first direction along a platen, comprising:

a pivotal mechanism having a pair of stopping portions, a first stopping portion and a second stopping portion, which are turned to a first position when the carriage is moved in the first direction and turned to a second position when the carriage is moved in the second direction by the carriage movement mechanism;

an operation mechanism comprising a rotating body which is rotated by a driving motor having a first supporting portion and a second supporting portion, a first cylindrical member which is engaged with a first supporting portion with play being provided with a first stopping projection in the circumference, a second cylindrical member which is engaged with a second supporting portion with play being provided with a second stopping projection in the circumference, a first clutch mechanism which connects or disconnects the transmission of the rotating force from the rotating body disposed between the first supporting portion and the first cylindrical member, a second clutch mechanism which connects or disconnects the transmission of the rotating force from the rotating body being disposed between the second supporting portion and the second cylindrical member, a hammer cam member which is rotated following the rotation of the first cylindrical member, and a lift cam member which is rotated following the rotation of the second cylindrical member;

a printing hammer driving mechanism which strikes type elements on the type wheel with the printing hammer responsive to the rotation of the above-mentioned hammer cam member;

a ribbon lift mechanism which shifts a correction ribbon up or down corresponding to the rotation of the lift cam member;

a selecting mechanism comprising a first selecting member in which a first engagement portion is provided which can be selectively engaged with the first stopping portion of the above-mentioned pivotal mechanism and which has a first stopping claw to be engaged with the first stopping projection of the first cylindrical member and selects the printing hammer driving mechanism, and a second selecting member in which a second engagement portion is provided which can be selectively engaged with the second stopping portion of the pivotal mechanism and which has a second stopping claw to be engaged with the second stopping projection of the second cylindrical member and selects the ribbon lift mechanism; and

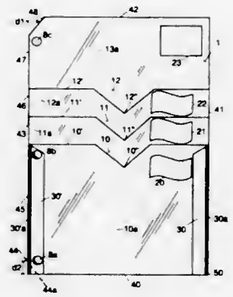
a solenoid mechanism which releases the engagement of the first stopping claw with the first stopping projection of the first cylindrical member in a state where the first stopping portion of the above-mentioned pivotal mechanism is being engaged with the first engagement portion of the first selecting member and also releases the engagement of the second stopping claw with the second stopping projection of the second cylindrical member in a state where the second stopping portion of the pivotal mechanism is being engaged with the second engagement portion of the second selecting member.

5,586,829

SINGLE FOOTPRINT SAME FACE TRI-POCKET ARRAY

David C. Schwartz, Southboro, Mass., assignor to Productive Environments, Inc., Framingham, Mass.

Filed Feb. 16, 1994, Ser. No. 197,500
Int. Cl.[6] B42F *21/02;7/02*
U.S. Cl. 402—79 **13 Claims**



1. A section of foldable material for forming a tri-pocket array, said section of material comprising at least an interconnected set of panels including a backing panel of predetermined height having perimeter features including adjoining first and second backing panel edges, a first pocket panel, a second pocket panel, and a third pocket panel, said interconnected set of pocket panels being attached off at least one of said first and said second of said adjoining first and second backing panel edges, each of said pocket panels having an entry lip edge of predetermined height, said pocket panels forming a first pocket, a second pocket, and a third pocket of a tri-pocket array, wherein a first pocket panel of said first, second, and third pocket panels is disposed along a first of said first and second adjoining backing panel edges, and a third pocket panel of said first, second, and third pocket panels is disposed along a second of said first and second adjoining backing panel edges, and where a second pocket panel of said first, second, and third pocket panels is disposed between said first pocket panel and said third pocket panel of said first second, and third pocket panels, and where each of said predetermined heights of said first, second, and third pocket panel entry lip edges is less than said predetermined height of said backing panel.

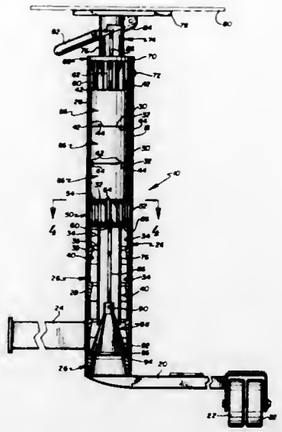
5,586,830

PIVOTING AND VARIABLE HEIGHT TABLE

Ronald G. Wanek; James C. Dotta, both of Arcadia; Brian Konkel, Mondovi, and Duane Herold, Arcadia, all of Wis., assignors to Ashley Furniture, Industries, Inc., Arcadia, Wis.

Filed Dec. 5, 1994, Ser. No. 349,533
Int. Cl.[6] F16B *7/10;* **F16D** *1/00;* **B25G** *3/18;* **A47B** *9/00*
U.S. Cl. 403—59 **20 Claims**

1. Device for allowing an object to be pivoted about a vertical axis and to be positioned at variable heights comprising, in combination: a vertical pillar having an elongated, vertically extending inner passage, with the inner passage including a plurality of vertically spaced, shoulder portions extending generally perpendicular to the vertical axis and having inner edges, with each of the shoulder portions being annular and centered and extending completely around the vertical axis; at least first and second fingers



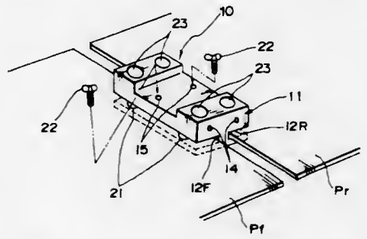
located on opposite diametric sides of the vertical axis, with the object being operatively attached to the fingers; and means for moving the fingers between a first position and a second position, with the fingers in the first position being of a size for movement in the inner passage and past the inner edges of the shoulder portions without engagement and in the second position being of a size for abutting with one of the shoulder portions for preventing vertically downward movement of the fingers therebeyond and for allowing the fingers to move on one of the shoulder portions in a circular path centered on the vertical axis.

5,586,831

CONNECTOR FOR CONNECTING TWO PLATE-LIKE MEMBERS

Kazuaki Tsubota, Hiroshima, and Takeshi Yamamoto, Hiroshima-ken, both of Japan, assignors to Delta Tooling Co., Ltd., and Delta Kogyo Co., Ltd., both of Hiroshima-ken, Japan

Filed Jun. 16, 1995, Ser. No. 491,578
Claims priority, application Japan, Oct. 25, 1994, 6-260104
Int. Cl.[6] F16B *5/06;* **B65H** *19/18;69/06*
U.S. Cl. 403—305 **19 Claims**



1. A connector for connecting two plate-like members, said connector comprising:

a main body having two rectangular grooves defined therein, said two rectangular grooves having respective upper and lower walls and being open on opposite sides of said main body for receiving therein ends of two respective plate-like members, said main body also having a center wall continuous with said upper and lower walls and separating said two rectangular grooves from each other; and

retaining means mounted on said main body for retaining the end of at least one of the two plate-like members within a

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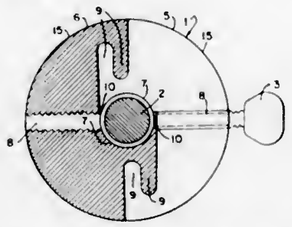
respective one of said rectangular grooves for subsequent simultaneous feed of the two plate-like members.

5,586,832

TWO PIECE INTERLOCKING SHAFT ATTACHMENT

Karl-Heinz Zylka, 1431 NE. 57th Ct., Fort Lauderdale, Fla. 33334

Filed May 22, 1995, Ser. No. 446,479
Int. Cl.[6] B25G *3/00;* **F16D** *1/00;* **F16H** *55/12*
U.S. Cl. 403—344 **14 Claims**



1. A two part encircling attachment for affixing to a rod or shaft, the attachment comprising:

(A) a first part having an edge portion substantially defining a half cylinder having an axis, a particular diameter, and a first pair of interlocking edge elements substantially diametrally opposed to one another;

(B) a second part having an edge portion substantially defining a half cylinder and a second pair of interlocking edge elements substantially diametrally opposed to one another;

(C) each of said pair of interlocking edge elements of said first part being arranged to interdigitate and thereby interlock with one of said interlocking edge elements of said second part when said edge elements of said first and second parts are moved together axially to form a completely encircling cylindrical attachment which resists radial dismemberment;

(D) a threaded passage extending radially through said first part intermediate the edge elements of said first part;

(E) an elongate threaded fastener arranged to be threadedly received in and through said passage for locking said attachment against said rod or shaft after said parts have been moved together to thereby prevent axial motion of said attachment on said rod or shaft;

(F) a radially extending aperture at one of said second pair of edge elements and adapted for aligning with said passage in said first part to receive said fastener passing through said passage prior to said fastener engaging said rod or shaft to thereby prevent relative axial movement between said parts.

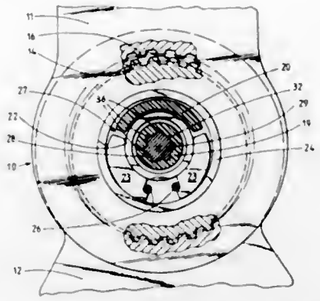
5,586,833

ARTICULATED FITTING FOR SEATS WITH ADJUSTABLE BACKREST, IN PARTICULAR MOTOR VEHICLE SEATS

Gregor Vossmann, Vreden, and Dirk Angermann, Cologne, both of Germany, assignors to Keiper Recaro GmbH & Co., Remscheid, Germany

Filed Nov. 10, 1994, Ser. No. 337,681
Claims priority, application Germany, Nov. 30, 1993, 43 40 696.3
Int. Cl.[6] B25G *3/28;* **B60N** *2/02;* **F16H** *1/32;* **F16B** *3/00*
U.S. Cl. 403—359 **10 Claims**

1. In an articulated fitting for seats having an adjustable backrest, in particular motor vehicle seats, in which a stationary articulated part associated with the seat part and a swivelable articulated part associated with the backrest are connected with one another via a swivel axle, having an adjusting and fixing device which determines the position of both articulated parts relative to one



another and is constructed as a gear unit, the swivel axle of each articulated fitting having a central recess or receptacle serving to connect with a transmission rod so as to be fixed with respect to rotation relative thereto, which transmission rod couples the two articulated fittings of a seat with one another, the improvement comprising:

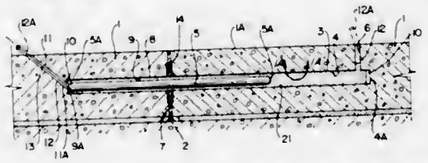
that the transmission rod and the recess of the swivel axel, which recess receives the transmission rod so as to be fixed with respect to rotation relative thereto, have a profile cross section in the shape of a toothed circumference, where said teeth are evenly spaced about said circumference and said circumference has a missing tooth which defines a double space between two adjacent teeth at a location on the circumference, this location on the circumference being reduced to a core cross section of said transmission rod so that the transmission rod may be inserted into the recess of the swivel axel after a complete revolution of 360 degrees.

5,586,834

JOINT STRUCTURE FOR COUPLING PRECAST CONCRETE PAVEMENT SLABS

Tomoyuki Tsuji, Otaru, Japan, assignor to Otaru Development and Construction Department of Hokkaido Development Bureau, Japan

Filed Oct. 11, 1994, Ser. No. 320,926
Claims priority, application Japan, Apr. 8, 1994, 6-071092
Int. Cl.[6] E01C *11/14*
U.S. Cl. 404—60 **9 Claims**



1. A joint structure for coupling adjacent precast concrete pavement slabs comprising:

a first horizontal hole defined through a first outer end surface of a first precast concrete pavement slab;

a second horizontal hole defined through a second outer end surface of a second precast concrete pavement slab, said second horizontal hole being opposite to the first horizontal hole and having an inner end surface;

a reinforcing bar having a distal end, said reinforcing bar accommodated into the first horizontal hole and then inserted into the second horizontal hole, said distal end formed semispherical;

the second precast concrete slab having an upper surface and a straightened guide passage defined therethrough which guide passage is provided to allow said inner end surface of the second horizontal hole to communicate with said upper surface, and said guide passage having a vinyl hose inserted therethrough;

a flexible hauling member connected to the distal end of the reinforcing bar, said flexible hauling member being insertable into the guide passage;

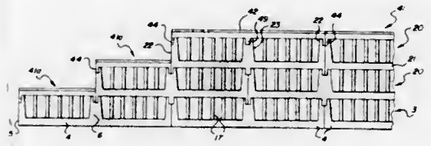
wherein said first and second horizontal holes are provided by securely embedding sheathing members made of steel pipes in the first and second outer end surfaces of the first and second precast concrete pavement slabs respectively, said sheathing members being cylinder-shaped, having the same diameters.

5,586,835

SHORE EROSION CONTROL STRUCTURES

Samuel S. Fair, 599 Linwood Beach Rd., Linwood, Mich. 48634

Filed Feb. 23, 1995, Ser. No. 393,179
Int. Cl.[6] E02B *3/04*
U.S. Cl. 405—30 **26 Claims**



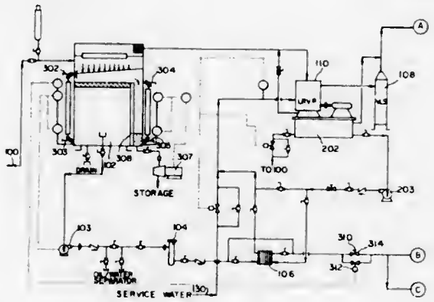
17. A block member for use in constructing a shore erosion control wall along a shoreline, said block member comprising a top panel and a bottom panel connected by spaced apart uprights to form at least one opening defined by said panels and said uprights; and a plurality of spaced apart baffles removably accommodated in said opening and supported by said bottom panel and forming a plurality of passages extending transversely through said block member and substantially parallel to said uprights.

5,586,836

BOOTSTRAPPING PROCESS OPTIMIZATION FOR TWO PHASE VACUUM EXTRACTION SYSTEMS

Steven R. Morrow, Hatboro, Pa., assignor to BCM Engineers, Inc., Plymouth Meeting, Pa.

Filed May 11, 1994, Ser. No. 241,127
Int. Cl.[6] E03B *3/12;* **E21B** *43/00*
U.S. Cl. 405—128 **25 Claims**



1. A system for receiving a two phase stream of liquids and gases drawn by a vacuum extraction system comprising:

a knock out pot for separating the liquids and gases;

a vacuum line connecting the knock out pot to a vacuum pump; and

a knock out pot pump connected to the knockout pot for removing liquid from the knockout pot,

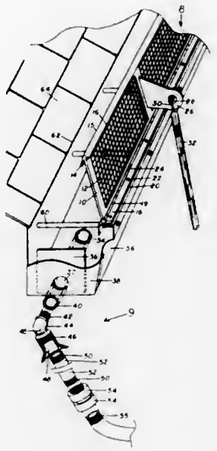
whereby a quantity of cooling liquid is supplied by liquid collected in the knockout pot.

5,586,837

RAINGUTTER LEAF GUARD AND CLEANING DEVICE

Steven D. Udelle, 13 Seasons Dr., Punta Gorda, Fla. 33983

Filed Jul. 10, 1995, Ser. No. 499,821
Int. Cl.[6] E02B *5/08;9/04;5/00;* **E04D** *13/076;13/00*
U.S. Cl. 405—119 **10 Claims**



1. A raingutter leafguard and cleaning device comprising:

a movably attached elongated sheet member of predetermined length and width mounted on the topside of a raingutter, and

said elongated sheet member having an integral grid means exhibiting a plurality of openings throughout said sheet member capable of passing a liquid therethrough said grid means, while preventing leaves and debris from entering said raingutter through said grid means, and

said sheet member having a first longitudinal edge and a second longitudinal edge, said first longitudinal edge comprising a first integral hinge means portion movably attached to a second hinge means portion, said second hinge means portion affixed to a top front surface of said raingutter, and said second longitudinal edge of said sheet member resting on raingutter hangers, and

a lever means affixed to said sheet member, for providing an arcuate movement to said sheet member at movable said first hinge means portion, said lever means having an opening guide at its uppermost portion for securing a hook means, and

said hook means affixed to a pole means having sufficient length, whereby said hook means is mated through an opening within said opening guide of said lever means, thereby causing lifting and pivoting of movable said sheet member when said pole means is pulled in a downward direction, thus dumping or releasing said leaves and debris adhering to said sheet member to the ground, and

said hook means affixed to said pole means for mating to said opening guide being operable by a human at ground level.

5,586,838

SEALED MARINE POST

Thomas M. Walsh, 53 LaFayette Ave., Suffern, N.Y. 10901

Filed May 30, 1995, Ser. No. 453,399
Int. Cl.[6] E02D *5/60;* **E04H** *12/00;* **B65H** *81/00;* **B32B** *31/00*
U.S. Cl. 405—216 **3 Claims**

1. A sealed marine post comprising:

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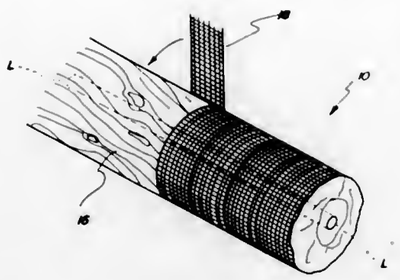


an elongated central post member having a longitudinal axis directed therethrough;

a first mesh layer wrapped about the central post member and including a plurality of orthogonally oriented fibers which extend parallel and orthogonal relative to the longitudinal axis of said central post member;

a first matrix resin layer impregnated within said first mesh layer and bonded with said central post member;

a second mesh layer wrapped about said central post member on top of said first matrix resin layer, said second mesh layer including orthogonally oriented fibers which extend at an oblique angle relative to the longitudinal axis of said central post member;

a second matrix resin layer impregnated within said second mesh layer and bonded with said first matrix resin layer;

a first upper mesh panel extending substantially orthogonally across an upper end of the central post member in a plane substantially parallel to said upper end, said first upper mesh panel being impregnated with said first matrix resin layer so as to seal said upper end of said central post member;

a second upper mesh panel extending across the upper end of said central post member on top of said first upper mesh panel and being impregnated with said second matrix resin layer, said first upper mesh panel including orthogonally oriented fibers and said second upper mesh panel including orthogonally oriented fibers positioned at an oblique angle to the fibers of said first upper mesh panel;

a first lower mesh panel extending substantially orthogonally across a lower end of said central post member and being impregnated with the first matrix resin layer so as to seal the lower end of said central post member;

a second lower mesh panel extending across the lower end of said central post member on top of the first lower mesh panel, said second lower mesh panel being impregnated with the second matrix resin layer, said lower mesh panels each including orthogonally oriented fibers, said fibers of said second lower mesh panel being positioned at an oblique angle relative to the fibers of said first lower mesh panel;

and,

a mounting means secured to a top end of the central post member for coupling the sealed marine post to a structure, said mounting means comprising a cylindrical receiver circumferentially positioned about and adhesively secured to the upper end of said central post member over said mesh layers and a mounting plate extending orthogonally across an upper end of said cylindrical receiver;

said mounting means further comprising a first mounting flange projecting substantially orthogonally from the mounting plate, and a second mounting flange projecting substantially orthogonally from the mounting plate, the mounting flanges being orthogonally oriented relative to one another so as to define a corner coupling which can be positioned at a juncture of two intersecting joists of a structure.

5,586,839

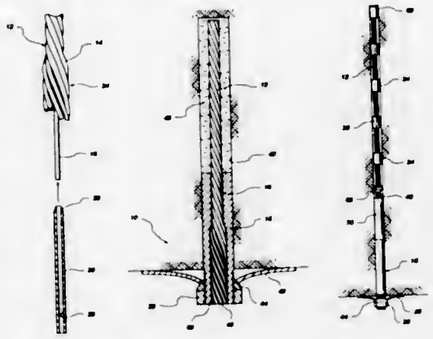
YIELDABLE CABLE BOLT

Harvey D. Gillespie, 4848 S. 2200 West, Salt Lake City, Utah 84118

Filed Sep. 6, 1994, Ser. No. 301,056

Int. Cl.[6] E21D *20/02*

U.S. Cl. 405—259.1 **27 Claims**



26. A yieldable cable bolt comprising:

a length of multi-strand cable comprising a center wire and a plurality of peripheral wires spirally wrapped around the center wire;

means defining an enlarged cable section of the cable;

an outer sleeve having an inside diameter slightly less than the outside diameter of the enlarged cable section, the cable being inserted through the outer sleeve, and the enlarged cable section being pressed into one end of the outer sleeve; and

a plurality of anchor sleeves swaged onto the cable.

27. A cable bolt comprising:

a length of multi-strand cable comprising a center wire and a plurality of peripheral wires spirally wrapped around the center wire;

an enlarged cable section of the cable comprising a center wire sleeve positioned around the cable center wire and between the cable center wire and peripheral wires; and

an outer sleeve positioned on the enlarged cable section to resist movement of the cable through the outer sleeve.

5,586,840

APPARATUS FOR DIGGING SOIL FOUNDATION AND METHOD FOR CONSTRUCTING UNDERGROUND WALL BY USING THE APPARATUS

Tadashi Nishio, and Shuichi Fukuda, both of Tokyo, Japan, assignors to Concrete Coring Company, Tokyo, Japan

PCT No. PCT/JP94/02006, § 371 Date Jul. 28, 1995, § 102(e) Date Jul. 28, 1995, PCT Pub. No. WO95/15419, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 30, 1994, Ser. No. 501,101

Claims priority, application Japan, Nov. 30, 1993, 5-229242; Dec. 28, 1993, 5-335181

Int. Cl.[6] E02D *3/12;5/18*

U.S. Cl. 405—267 **12 Claims**

1. A digging apparatus comprising:

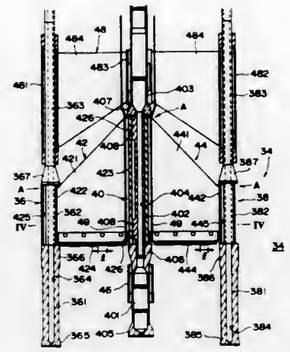
a cylindrical digging bit;

a plate digging bit extending radially outward from said cylindrical digging bit;

a rotary driving means for rotating said cylindrical digging bit;

a percussion means for applying percussion force to said cylindrical digging bit;

movement converting means positioned between said cylindrical digging bit and said plate digging bit and for converting rotary movement of said cylindrical digging bit into reciprocating movement of said plate digging bit;



percussion transfer means positioned between said cylindrical digging bit and said plate digging bit and for transferring said percussion force from said cylindrical digging bit to said plate digging bit.

5,586,841

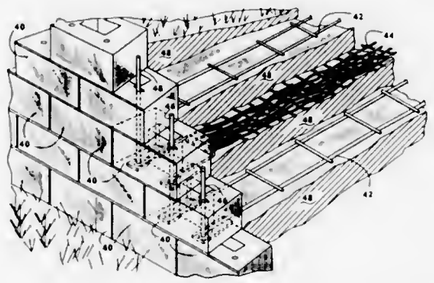
DUAL PURPOSE MODULAR BLOCK FOR CONSTRUCTION OF RETAINING WALLS

Peter L. Anderson, North Reading, Mass.; Michael J. Cowell, Leesburg, and Dan J. Hotek, Chantilly, both of Va., assignors to Societe Civile des Brevets Henri Vidal, France

Continuation-in-part of Ser. No. 137,585, Oct. 15, 1993, Pat. No. 5,474,405, and a continuation-in-part of Ser. No. 108,933, Aug. 18, 1993, Pat. No. 5,487,623, which is a continuation-in-part of Ser. No. 40,904, Mar. 31, 1993, Pat. No. 5,507,599. This application Feb. 3, 1995, Ser. No. 382,985

Int. Cl.[6] E02D *29/02*

U.S. Cl. 405—286 **30 Claims**



1. An improved retaining wall construction comprising, in combination:

a plurality of facing block members arrayed in overlapping courses one upon the other, each block member having a generally planar front face, a back face, opposite side faces connecting the front face to the back face, and generally parallel top and bottom surfaces;

each block member also including at least two generally parallel rod receiving throughbores extending from the top surface through the bottom surface, each throughbore including a counterbore in one of the parallel top and bottom surfaces, surrounding the throughbore and extending from adjacent the front face through the back face to define a channel with side walls in the block, and a cross throughbore connecting the parallel counterbores;

a stabilizing element comprising a pair of tension arms in the parallel counterbores of selected block members, each pair of said tension arms of each stabilizing element being generally parallel;

the stabilizing elements including soil engaging means extending therefrom projecting away from the back face of each block into compacted soil; and

compacted soil adjacent the back face engaging the stabilizing elements.

5,586,842

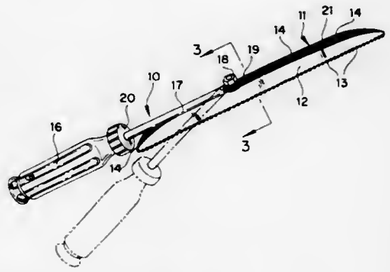
FILE GRINDER

Tae H. Bae; Sang Y. Bae, and Sang I. Bae, all of 6898 Old Annapolis Rd., Linthicum, Md. 21090

Filed May 3, 1994, Ser. No. 237,209

Int. Cl.[6] B23D *71/00;21/04;71/08*

U.S. Cl. 407—29.14 **1 Claim**



1. An abrasive tool comprising:

a plurality of straight elongated blades, each of said elongated blades having a substantially flat upper edge, an opposed lower edge having a plurality of spaced-apart teeth located thereon, a predetermined thickness, and a median line defined by a line extending along said elongated blades at a position halfway between said upper edge and said lower edge;

a plurality of spacer links interconnecting respective sides of said plurality of elongated blades together in spaced-apart relation, said spacer links being entirely located between said upper edge and said median line, a thickness of said spacer links being approximately equal to said predetermined thickness of said elongated blades, said elongated blades and said spacer links forming a composite structure having a predetermined length and opposed end portions, with outermost elongated blades of said composite structure defining a maximum overall width of said composite structure, said elongated blades being spaced-apart and substantially parallel to one another along substantially their entire length to form a longitudinal passage between each of said elongated blades, each said longitudinal passage having a passage depth extending from said lower edge of said elongated blades to a depth beyond said median line, each said longitudinal passage of said passage depth extending along substantially the entire length of said composite structure, each said longitudinal passage between said elongated blades decreasing in both width and height at each of said opposed end portions to form a tapered end portion of said composite structure, each longitudinal passage including a plurality of longitudinal openings adjacent said upper edges of said plurality of elongated blades for allowing grinding dust to pass therethrough;

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an elongated substantially cylindrical handle, said handle including an elongated rod located coaxially therein and extending longitudinally therefrom; and

fastening means for fastening said rod to said composite structure, said fastening means including a threaded member extending from said upper edges of said elongated blades and located approximately centrally along the length of said composite structure, an aperture located at a distal end of said rod for loosely receiving said threaded member therein, and a nut threadably attached to said threaded member, said fastening means allowing said composite structure to pivot relative to said handle such that a longitudinal axis of said composite structure may assume any angular orientation within 360° with respect to a longitudinal axis of said handle.

5,586,843

INDEXABLE CUTTING INSERT FOR ROTARY CUTTING TOOLS

Alfonso Minicozzi, Montreal, Canada, assignor to International Minicut, Inc., Montreal, Canada

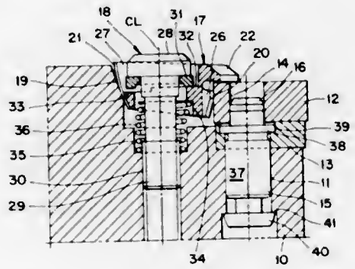
PCT No. PCT/CA93/00083, § 371 Date Sep. 1, 1994, § 102(e) Date Sep. 1, 1994, PCT Pub. No. WO93/17822, PCT Pub. Date Sep. 16, 1993

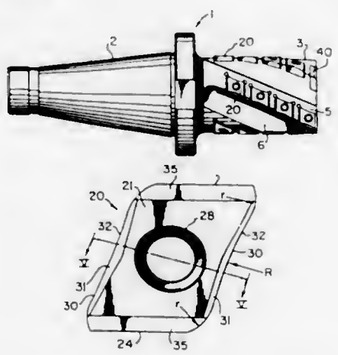
PCT Filed Mar. 2, 1993, Ser. No. 295,758

Claims priority, application Canada, Mar. 3, 1992, 2062213

Int. Cl.[6] B23C *5/00*

U.S. Cl. 407—42 **18 Claims**





10. A rotary cutting tool comprising a cutting portion having a longitudinal axis and a plurality of helically arranged teeth separated by helical gullets extending the length of said cutting portion, the leading edge of each tooth comprising a plurality of sockets and cutting inserts disposed in said sockets, each cutting insert comprising a six sided block having a longitudinal axis and two major parallel rhomboid-shaped plane surfaces constituting a seating face and a clearance face respectively, two opposed minor side surfaces constituting cutting faces extending parallel to said longitudinal axis and extending between said seating and clearance faces, each said cutting face forming an acute angle with said clearance face and forming a cutting edge along the intersection therewith, and two minor parallel plane and faces extending between seating and clearance faces and said two cutting faces, each said cutting face having a concave curvature centrally of its major dimension, and convex curvature at each end of its major dimension to define a serpenting cutting face and cutting edge; said sockets being of complementary shape to said cutting inserts and so disposed along each tooth that said cutting inserts are arranged along the leading edge of each tooth substantially the length thereof, with cutting edges in operable relationship thereto and in substantially parallel relationship with the leading edge of said tooth.

5,586,844

TOOLHOLDER CLAMPING WEDGE WITH INSERT ENGAGING PROTRUSIONS

Folke Nyman, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Feb. 24, 1995, Ser. No. 393,685

Claims priority, application Sweden, Mar. 4, 1994, 9400742

Int. Cl.[6] B23B *27/16;29/04*

U.S. Cl. 407—105 **11 Claims**

1. A toolholder for holding a cutting insert having top and bottom faces, a center through-hole, and an edge face, said toolholder comprising:

a holder body having a top surface, a forward portion of said top surface defining an insert site for receiving an insert, the top surface including a generally upstanding supporting surface spaced rearwardly from said insert site, said supporting surface being inclined downwardly and forwardly;

a pin disposed in said body and having an upper end projecting upwardly at said insert site for entering a center through-hole of an insert to locate the insert;

a clamping wedge mounted on said body for up and down movement relative thereto, said clamping wedge including a rear end for engaging said supporting surface, a front end for engaging an insert mounted at said insert site, and a fastener hole extending downwardly through said clamping wedge, said front end including:

a pair of forwardly projecting upper protrusions disposed on opposite sides of an imaginary plane containing a center axis of said pin and a center axis of said fastener hole, said upper protrusions arranged to bear downwardly against the top face of the insert,

a concave surface interconnecting said upper protrusions, said concave surface arranged coaxially with respect to said pin and having a radius of curvature no shorter than a radius of said pin, and

a pair of forwardly projecting lower protrusions disposed on opposite sides of said imaginary plane, said lower protrusions arranged to bear forwardly against the edge face of the insert; and

a fastener comprising a clamp screw projecting through said fastener hole and threadedly secured in said body for bearing downwardly on said clamping wedge to push said upper protrusions downwardly against the top face of the insert while pushing said rear end downwardly against said supporting surface to cause said lower protrusions to be pushed forwardly against the edge face of the insert.

5,586,845

FACE MILLING CUTTING INSERT HAVING CONVEX RAKES WITH OBTUSELY INTERSECTING FLAT SURFACES

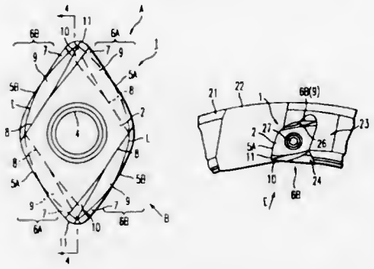
Tatsuo Arai, and Takayoshi Saito, both of Ibaragi-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,547

Claims priority, application Japan, Dec. 28, 1993, 5-350015

Int. Cl.[6] B23C *5/06;5/22*

U.S. Cl. 407—113 **2 Claims**



1. A cutting insert comprising:

an insert body having a parallelogrammic plate shape;

a plurality of cutting edges formed in a peripheral direction along peripheries of upper and lower surfaces of said insert body on a pair of opposite ridge portions of the upper surface of said insert body and a pair of opposite ridge portions of the lower surface of said insert body in a staggered position relative to the pair of upper surface ridge portions; and

a first and second pair of rakes extending from said cutting edges, said rakes being formed in side surfaces of said insert body connecting to said cutting edges, each of said rakes being inclined with respect to the upper and lower surface;

wherein each of said rakes has a convex curved surface portion which is formed along one side of the corresponding side surface connecting to said cutting edge and which is curved along said peripheral direction so as to round out in an outward direction from said insert body, and a flat surface portion which obtusely intersects said convex curved surface portion and which connects to the ridge portion of the side surface opposite said cutting edge.

5,586,846

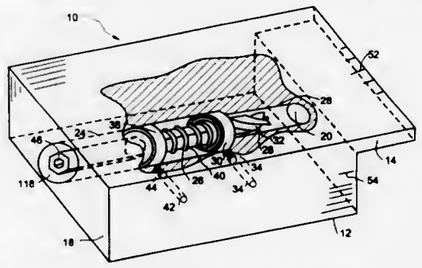
PORTABLE DOWEL BORING TOOL

Joseph J. Johns, 11384 Jeb Stuart La., Culpeper, Va. 22701

Continuation-in-part of Ser. No. 442,158, May 16, 1995, abandoned. This application Mar. 4, 1996, Ser. No. 610,697

Int. Cl.[6] B23B *45/14*

U.S. Cl. 408—72 R **16 Claims**



1. A dowel-hole boring device for boring dowel receiving holes at a predetermined angle and depth having:

a body, said body having a first end and a second end;

a first interior channel, said first interior channel being open to said first end;

a second interior channel, said second interior channel being open to said second end and contiguous to said first interior channel;

a pair of bearings, said pair of bearings having an interior diameter and an exterior diameter, said exterior diameter being dimensioned to fit within said first interior channel;

a shaft, said shaft being dimensioned to fit within the interior diameter of said pair of bearings to prevent relative rotation between said shaft and inner races of said bearings, having a drill bit receiving means at one end and a receiving groove;

a spring, said spring separating said pair of bearings a predetermined distance from one another.

5,586,847

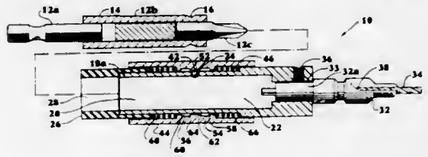
POWER TOOL ADAPTER

Charles J. Mattern, Jr., 309 Bank Ave. No. A2, and Lawrence G. Tatum, Taylors La. Farm, both of Riverton, N.J. 08077

Filed Jun. 6, 1995, Ser. No. 466,838

Int. Cl.[6] B23B *51/12;31/22*

U.S. Cl. 408—239 A **19 Claims**



1. A power tool adapter for being quickly connected and disconnected to a first power driven rotary drive bit, the first drive bit having an outer periphery, said power tool adapter comprising:

a. an inner sleeve having a first end and a second end, said first end including an opening for accessing a cavity within said inner sleeve, said sleeve including at least one radially extending opening, said cavity being sized to complementarily receive at least a portion of the first drive bit, said first drive bit including a keyed portion which is rotatably fixed to a complementarily shaped portion of said inner sleeve, said second end of said inner sleeve having a second rotary cutting bit secured thereto;

b. a locking mechanism operatively engaged with said inner sleeve; and

c. an outer sleeve having a cavity slidably receiving at least a portion of said inner sleeve therein, said outer sleeve being movable from a first position, wherein said outer sleeve maintains the locking mechanism in engagement with the first drive bit to lock the first drive bit to said inner sleeve, in a first direction to a second position wherein the locking mechanism is disengaged from the first drive bit to permit the first drive bit to be removed from the cavity of the inner sleeve, and from the first position in a second direction to a third position wherein the locking mechanism is removable from the cavity of the inner sleeve to permit the first drive bit to be installed into the cavity of the inner sleeve, said outer sleeve being biased toward said first position.

5,586,848

MACHINE TOOL CHIP REMOVAL SYSTEM

Paul W. Suwijn, Pittsford, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed May 2, 1995, Ser. No. 433,277

Int. Cl.[6] B65G *47/46;* **B23C** *1/00;* **B23F** *23/00*

U.S. Cl. 409—137. **26 Claims**

1. An apparatus for performing wet or dry machining processes, said apparatus comprising a machine base having top and bottom surfaces and a plurality of side surfaces, said apparatus further

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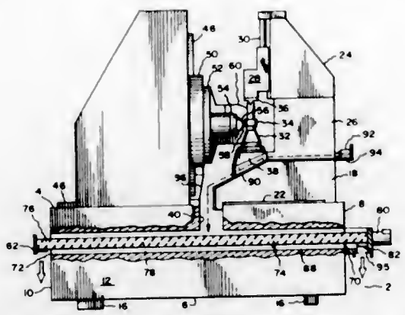


comprising a tool support located on said base top surface and a workpiece support located on said base top surface, said apparatus including means to move said tool and workpiece supports relative to one another to engage a tool and workpiece in a manner to machine said workpiece, said apparatus comprising means to remove metal chips resulting from said wet or dry machining processes from said apparatus via respective independent wet and dry chip outlets, the chip removal means comprising:

a first passageway located in said machine base, said first passageway extending between an outlet in two of said plurality of side surfaces,

a second passageway located in said machine base, said second passageway extending from said top surface to said first passageway and communicating therewith, said second passageway providing a means of passage to said first passageway for metal chips resulting from said machining processes,

transfer means located in and extending the length of said first passageway, said transfer means being reversible in direction in order to convey metal chips from said machining processes and received via said second passageway to said outlet in either of said two side surfaces, thereby enabling metal chips from wet machining processes to be conveyed to and discharged from an outlet in one side surface and metal chips from dry machining processes to be conveyed to and discharged from an outlet in another side surface.

5,586,849

WHEEL RESTRAINT DEVICE AND QUICK-CONNECT HOOKS FOR USE THEREWITH

James L. Kissel; Earl J. Dailey, and Daniel F. Dolan, all of Rapid City, S. Dak., assignors to Rushmore Vehicle Restraints, L.L.C., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 291,779, Aug. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 202,342, Feb. 28, 1994, abandoned. This application Jan. 27, 1995, Ser. No. 379,731

Int. Cl.[6] B60P *3/06*

U.S. Cl. 410—10 **22 Claims**

1. A device for restraining a wheel on a vehicle to a support surface on which the wheel is supported, the device comprising:

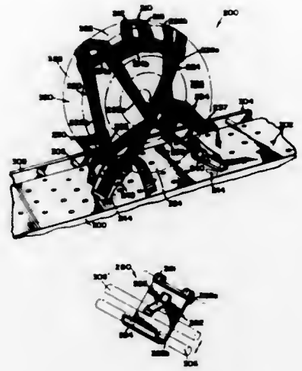
(a) a restraining member, comprising:

(i) an upper restraint supported on a upper outer surface of the wheel;

(ii) inner and outer flexible members coupled to and extending from the upper restraint on inner and outer sides of the wheel, respectively; and

(iii) a lower restraint including a flexible member coupled to the inner and outer flexible members and abutting a lower outer surface of the wheel; and

(b) inner and outer securing means for respectively securing the inner and outer flexible members to the support surface.



5,586,850

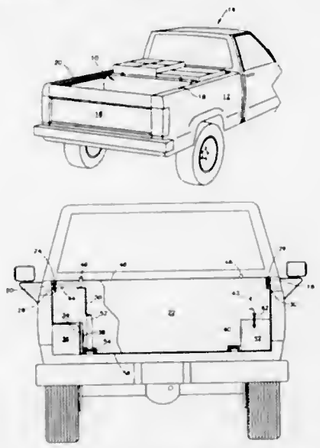
TRUCK BED CARGO DIVIDER

James H. Johnson, Rte. 1, Box 276-1, Ore City, Tex. 75683

Filed Sep. 11, 1995, Ser. No. 524,946

Int. Cl.[6] B60P *7/14*

U.S. Cl. 410—138 **2 Claims**



1. A truck bed cargo divider for a pickup truck comprising:

a cargo bed in the pickup truck;

a floor in the cargo bed;

wheel wells extending into a cargo area defined by the cargo bed;

a panel having a size and dimension approximately equal in size to a dimension of a plane transverse to a longitudinal axis of the cargo bed;

at least two spaced apart sidewalls in the cargo bed;

a first track means for supporting the panel affixed to the side walls of the truck bed;

wheel assembly means attached to the panel and adapted to ride on the track means for allowing translational movement to the panel;

a recess area in the panel on opposed sides for clearance between the panel and each wheel well;

door means attached by hinges to the panel proximate each recess area for closing the recess area;

a second track means affixed to the floor of the truck bed and extending the length of the floor parallel with the longitudinal axis;

lock means mounted in the panel, proximate each track means for controlling movement of the panel along the track means within the truck bed cargo area;

the first track means includes a continuous series of slots facing each side edge of the panel;

the second track means includes a continuous series of slots facing a bottom edge of the panel;

the lock means includes a horizontal sliding bolt mounted within the panel on each side for engagement with the slots in the first track means;

the lock means includes a vertical sliding bolt mounted within the panel on each side for engagement with the slots in the second track means;

the horizontal sliding bolt includes an operating handle extending from a top edge of the panel;

the horizontal sliding bolt and the vertical sliding bolt are interconnected;

a connecting rod for connecting the horizontal sliding bolt and the vertical sliding bolt;

the connecting rod biases the horizontal sliding bolt in a locked position; and

a recess in the top edge of the panel, on each side, for securing the sliding bolt handle in an unlocked position, whereby movement of the horizontal sliding bolt from a said track slot of the first track means and rotation of the handle will cause the connecting rod to withdraw the vertical sliding bolt and thereby allow the panel to move freely on the first track means.

5,586,851

PRESTRESS-MONITORING ELEMENT FOR SCREW-TYPE ANCHORS

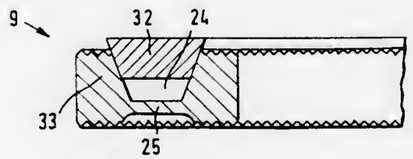
Manfred Haage, Dornstetten, Germany, assignor to fischerwerke, Artur Fischer GmbH & Co KG, Waldachtal, Germany

Filed May 19, 1995, Ser. No. 445,998

Claims priority, application Germany, Jun. 23, 1994, 44 21 959.8

Int. Cl.[6] F16B *31/02;* **G01L** *5/00*

U.S. Cl. 411—10 **4 Claims**



1. A prestress-monitoring element for a screw-type anchor to be arranged on an anchoring rod of the screw-type anchor between an article to be fixed to a wall and the screw element of the screw-type anchor, the prestress-monitoring element comprising a dimensionally stable pressure ring and an expansible expansion ring having contact surfaces therebetween, said contact surfaces between said rings including at least one contact surface which is formed as a conical annular surface, said rings being formed so that under the action of a clamping force generated by the screw-type element toward the prestress-monitoring element, by way of bearing surfaces, a radial force component expands said expansion ring, and in an end position of the screw-type element when a maximum relative axial displacement between said pressure ring and said expansion ring has been achieved, the screw-type element abuts against both rings, said expansion ring having an end face provided with a circumferential groove, said pressure ring having a trapezoidal cross-section and engaging in said circumferential groove so that said expansion ring expands radially outward into said groove as said pressure ring presses in.

5,586,852

SPRING-LOADED PRESS PIN

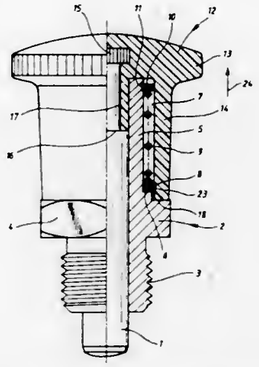
Bernhard Ganter, Furtwangen, Germany, assignor to Otto Ganter & Co. KG, Furtwangen, Germany

Filed Nov. 30, 1994, Ser. No. 352,061

Claims priority, application Germany, Dec. 28, 1993, 9319799 U; Dec. 28, 1993, 9319800 U

Int. Cl.[6] F16B *21/18*

U.S. Cl. 411—353 **8 Claims**



1. A press pin comprising a longitudinally extending pin, a longitudinally extending guide sleeve longitudinally slidably mounted on said pin, said pin having one end extending axially from one end of said guide sleeve, the other end of said pin having a stud connected thereto, said stud including a longitudinally extending sleeve portion telescopically overlapping a portion of said guide sleeve, said sleeve portion of the stud having an inner diameter larger than the external diameter of said guide sleeve to form an axially extending circumferential recess between the guide sleeve and sleeve portion of the stud, a compression spring oriented in said recess and having ends engaged with said guide sleeve and said sleeve portion of the stud to exert resilient force biasing said guide sleeve axially inwardly in relation to said stud and pin, said guide sleeve including a structure adapted to connect said guide sleeve to a mounting structure to enable the stud and pin to move axially outwardly in relation to the guide sleeve and mounting structure by exerting axial outward force on said stud sufficient to compress said spring.

5,586,853

FASTENER CAGE FOR A PANEL

Charles A. Poe, Athens, Tenn., assignor to Davidson Textron Inc., Dover, N.H.

Filed Mar. 16, 1995, Ser. No. 405,367

Int. Cl.[6] F16B *19/00*

U.S. Cl. 411—372 **9 Claims**

1. A molded plastic fastener cage for securing a fastener in an aperture formed in a rigid panel structure having opposed inner and outer side surfaces, said cage comprising:

a molded plastic collar having a central opening extending through said collar between opposite axial ends thereof and registerable with the aperture in the panel structure, a first annular shoulder surrounding said opening at one of said axial ends of said collar and engagable with the outer side of the panel structure about the aperture, and a second annular shoulder surrounding said opening at the other of said axial ends of said collar facing away and spaced axially from said first shoulder so as to be exposed on the exterior side of the panel structure for engagement by an assembly end of the fastener to transmit compressive pushing loads applied to the fastener during installation of the panel structure through said

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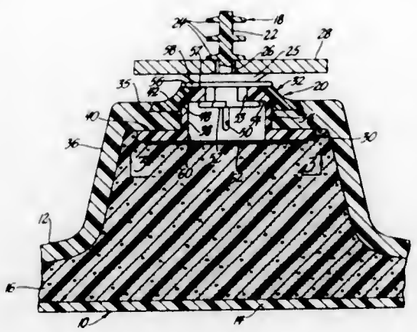


collar to the outer side surface of the panel structure lying beneath said first annular shoulder;

a molded plastic retainer formed separately from said collar having a sleeve portion extending between opposite inner and outer axial ends of said retainer and defining a central axial opening of said retainer extending between said ends thereof, said outer end of said sleeve portion being dimensioned for extension through the aperture of the panel structure and into said opening of said collar, said retainer and said collar including snap together connecting structure mutually engagable with one another upon the extension of said sleeve portion into said collar to secure said retainer attached to said collar, said retainer including an annular formation at said outer axial end of said sleeve portion defining first an second annular shoulders extending radially inwardly of said collar in axially spaced oppositely facing relation to one another for capturing an assembly end of the fastener, said retainer including an annular flange at said inner axial end of said sleeve portion defining a third annular shoulder extending radially outwardly of said sleeve portion disposed in axially spaced facing relation to said first shoulder of said collar for engaging the inner side surface of the panel structure thereby to mount said cage within the aperture of the panel structure, said third annular shoulder cooperating with one of said first and second shoulders of said retainer to transmit extensive pulling loads applied to the fastener during dismounting of the panel structure through said retainer and to the inner surface of the panel structure lying beneath said third shoulder of said retainer; and

a foam-impervious cover member adhered to said axially inner end of said retainer and extending across said opening of said retainer sealing off said retainer opening to prevent the entry of foam material into said retainer opening during formation of a plastic foam layer against the inner side of the panel structure.

5,586,854

CONNECTOR FASTENING NUT AND BOLT-NUT FASTENED CONNECTOR

Hitoshi Sakai, and Kazuto Ohtaka, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,407

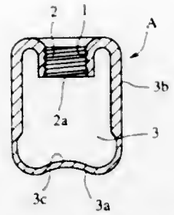
Claims priority, application Japan, Aug. 19, 1994, 6-195226

Int. Cl.[6] F16B *37/14;39/34*

U.S. Cl. 411—429 **6 Claims**

1. A connector fastening nut for a bolt-nut fastened connector, comprising:

a nut member fixed to a first connector housing and having a female threaded portion engaged with a male threaded portion of a fastening bolt fitted to a second connector housing; and



an elastic portion integral with said nut member, for urging an end of the fastening bolt in an engagement direction between the female threaded portion of said nut member and the male threaded portion of the fastening bolt, when the male threaded portion has been passed through the female threaded portion after full engagement of the two connector housings by fastening the fastening bolt to the fastening nut, wherein said nut member is a box-shaped nut; and said elastic portion is in a side wall portion of the box-shaped nut integral with the female threaded portion of said nut member.

5,586,855

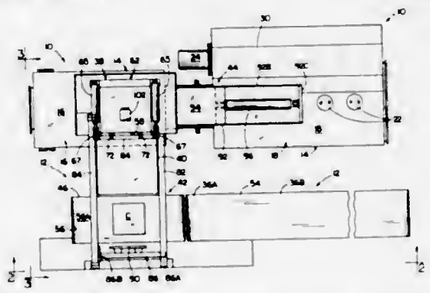
APPARATUS AND METHOD FOR INFEEDING BATCHED MATERIALS

Roger D. Eshleman, 506 Clayton Ave., Waynesboro, Pa. 17268

Filed Nov. 23, 1993, Ser. No. 157,359

Int. Cl.[6] F23G *5/00*

U.S. Cl. 414—160 **44 Claims**



1. An apparatus for infeeding batched material to an inlet opening of a material processing apparatus, said batched material infeeding apparatus comprising:

(a) a lift mechanism disposed alongside a material processing apparatus and being operable to lift a batched material at least to the elevation of an inlet opening of the material processing apparatus;

(b) a delivery conveyor disposed alongside the material processing apparatus and adjacent to said lift mechanism and being operable to deliver the batched material to said lift mechanism; and

(c) a transfer enclosure spaced from said lift mechanism and disposed above the inlet opening of the material processing apparatus, said transfer enclosure having an entrance for receiving batched material from said lift mechanism and an exit for subsequent discharge of the batched material from said transfer enclosure into the material processing apparatus through the inlet opening thereof;

(d) said lift mechanism including

(i) a transfer deck for supporting the batched material, and

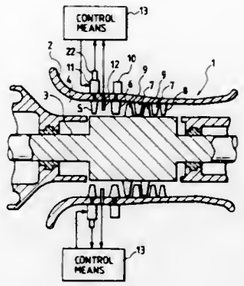
(ii) a drive assembly supporting said deck and being operable to have said deck between a lowered loading position and a raised unloading position,

(iii) said transfer deck including movable means operable to undergo movement in a transverse direction relative to the direction of the movement of said deck between said raised and lower positions for aligning the batched material supported by said deck with said entrance of said transfer enclosure when said deck is at said raised unloading position of said lift mechanism;

(e) said delivery conveyor including

(i) an end portion disposed adjacent to said lowered loading position of said deck of said lift mechanism, and

(ii) a main portion extending away from said lift mechanism to provide space for loading the batched material on said delivery conveyor, said delivery conveyor being operable to deposit the batched material at the location of said movable means on said deck of said lift mechanism each time said deck is disposed at said lowered loading position.



5,586,856

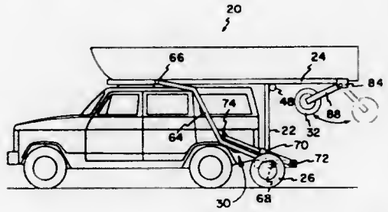
LIFT APPARATUS

William O. Springer, 709 37th Ave. North, Fargo, N. Dak. 58102

Filed Apr. 19, 1995, Ser. No. 424,860

Int. Cl.[6] B60P *9/00*

U.S. Cl. 414—462 **23 Claims**



1. An apparatus for raising and supporting an article above a vehicle, comprising:

a wheel assembly including a set of wheels, mounting to a rear of the vehicle;

a platform for supporting the article including supplementary wheels retractably mounted at the rear of the platform;

a lift frame mounting on the wheel assembly;

arms rotatably mounted to the lift frame proximate the wheel assembly, connecting to and supporting the platform at an extended end thereof, wherein the arms rotate between a lowered position and a raised position; and

a cross member mounted above the wheel assembly engaging the platform upon actuation of the apparatus from the lowered to the raised position and supporting the platform in the raised position, wherein the article is supported above the platform in the lowered and raised positions.

5,586,857

ROTATING STALL PREVENTION SYSTEM FOR COMPRESSOR

Hiroshi Ishii, Chiyoda-machi; Tetsuo Sasada, Hitachi; Masayuki Kasahara, Chiyoda-machi; Yasuhiro Katoh, Hitachi, and Yasushige Kashiwabara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 145,592, Nov. 4, 1993, abandoned.

This application Jun. 30, 1995, Ser. No. 497,417

Claims priority, application Japan, Nov. 11, 1992, 4-300803

Int. Cl.[6] F01D *17/00*

U.S. Cl. 415—23 **9 Claims**

1. A rotating stall preventing system of a compressor, which has rows of compressing blades including rotor blades and stator blades in a flow passage of the compressor and means for performing flow control corresponding to the rotating speed of said compressor, said rotating stall prevention system comprising: baffle vanes separate from said means for performing flow control of said compressor, said baffle vanes being rotatably mounted in said flow passage upstream of said compressing blade rows so that their angles can be varied, actuators coupled to said baffle vanes to rotate said baffle vanes to vary their angles, flow sensors to detect flow condition in said flow passage of the compressor, and control means responsive to signals from said flow sensors for outputting control signals to said actuators for varying the angles of said baffle vanes so as to prevent occurrence of rotating stall phenomena.

5,586,858

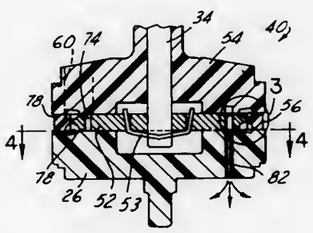
REGENERATIVE FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Apr. 7, 1995, Ser. No. 418,666

Int. Cl.[6] F04D *5/00*

U.S. Cl. 415—55.1 **16 Claims**



1. An electric-motor fuel pump that comprises:

a housing including a fuel inlet and a fuel outlet,

an electric motor including a rotor and means for applying electrical power to said motor to rotate said rotor within said housing,

pump means including an impeller coupled to said rotor for corotation therewith and having a periphery with a circumferential array of vanes, and means forming an arcuate pumping channel surrounding said impeller periphery and coupled to said inlet and said outlet, said means forming said pumping channel including channel inlet and outlet ports at opposed ends of said pumping channel,

said vanes comprising circumferential arrays of axially facing pockets on opposed axial side faces of said rotor, a channel extending radially inwardly from each pocket on each axial side face of said rotor, and a passage extending axially through said impeller radially inwardly of said pockets interconnecting said channels, and

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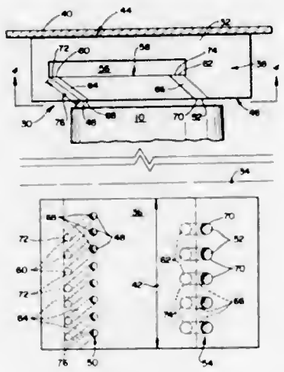
vent means in said pump means for sequential registry with said passages in said impeller as said impeller rotates to vent vapor from within said pockets and said pumping channel.

5,586,859

FLOW ALIGNED PLENUM ENDWALL TREATMENT FOR COMPRESSOR BLADES

Nick A. Nolcheff, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1995, Ser. No. 455,580
Int. Cl.[6] F01D *1/12*
U.S. Cl. 415—58.5 **4 Claims**



1. A tip shroud assembly for use with an axial flow gas turbine engine case, said tip shroud assembly comprising:

an annular shroud secured to said engine case and extending circumferentially about a reference axis, said shroud including a plurality of arcuate segments, each segment having a circumferentially extending length, the sum of said lengths defining the circumference of said annular shroud, each segment comprising

an arcuate member having:

a radially outer surface, and a radially inner surface including a plurality of first holes defining a first row and a plurality of second holes defining a second row, each of said rows extending circumferentially along the length of said segment, said first row in spaced relation to said second row,

a circumferentially extending plenum spaced radially outward from said radially inner surface,

a plurality of first passages, each first passage extending from one of said first holes to said plenum, and a plurality of second passages, each second passage extending from one of said second holes to said plenum, each of said passages having a first and a second end, wherein said plenum communicates with said radially inner surface through each of said first and second passages,

a plenum surface radially outward of the radially inner surface said plenum surface including:

a plurality of third holes, each of said third holes defining the second end of one of said first passages, and a plurality of fourth holes, each of said fourth holes defining the second end of one of said second passages, each of said first holes defines the first end of one of said first passages, and the first hole of each first passage is spaced circumferentially along the length of the segment from the third hole thereof,

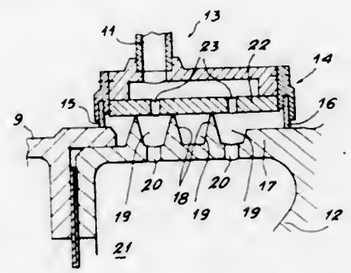
wherein the first hole of each first passage is spaced axially relative to said axis from the third hole thereof.

5,586,860

TURBO AERO ENGINE PROVIDED WITH A DEVICE FOR HEATING TURBINE DISKS ON REVVING UP

Jean-Louis Bertrand, Livry S/Seine; Gilles A. Charier, La Grande Paroisse; Xavier J.A. Guyonnet, St. Fargeau Ponthierry, and Jean-Louis Picard, Vaux le Penil, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma", Paris, France

Filed Oct. 31, 1994, Ser. No. 332,101
Claims priority, application France, Nov. 3, 1993, 93 13044
Int. Cl.[6] F01D *5/08; 11/12*
U.S. Cl. 415—115 **13 Claims**



1. A turbo aero engine including a rotor, a stator, a combustion chamber upstream of a turbine belonging to the rotor and party constituted by a disk, wherein it includes a channel for sending and blowing hot gas from a drawing off zone of the turbo aero engine to a central zone of the disk, the sending channel being composed of a portion opening into the drawing off zone and integral with the stator, and another portion integral with the rotor, the two portions being joined by an annular assembly including concentric walls for closing the portions, the walls, however, being perforated by orifices, and further including for one of the portions, circular parallel peaks established on the wall of said one portion being adjusted towards the other of the portions where the peaks approximately touch the wall, and delimiting grooves with certain of the grooves having no orifices, the orifices of the other portion being situated so that, according to the differential heat expansions in the turbo aero engine at different operating conditions, they open either in front of the grooves without orifices for certain conditions or in front of the grooves with orifices for other conditions.

5,586,861

AIRFLOW MEASURING CENTRIFUGAL FAN

Thomas A. Berger, Portland, Oreg., assignor to Pace Company, Portland, Oreg.

Continuation-in-part of Ser. No. 63,013, May 17, 1993, abandoned. This application Jun. 1, 1994, Ser. No. 252,192
Int. Cl.[6] F04D *29/00*
U.S. Cl. 415—118 **12 Claims**

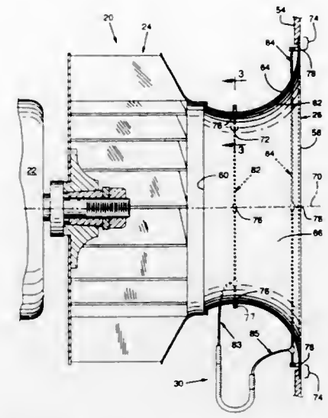
1. An air flow measuring inlet cone for a centrifugal fan within a ventilation system comprising:

an inlet cone defining a major passage for the passage of air, the inlet cone having a flared inlet with a first diameter, a narrow throat with second diameter smaller than the first diameter, and a flared outlet with third diameter smaller than the first diameter and larger than the second diameter, the inlet cone having an empirically determined constant representative of its flow characteristics;

a first static pressure tap for measuring the static pressure at the flared inlet;

a second static pressure tap for measuring the static pressure at the throat;

means for determining the air flow through the inlet cone based on the difference between the static pressure at the flared inlet and the static pressure at the throat and the empirically determined constant.



4. A method for measuring the air flow within a ventilation system having a centrifugal fan and an inlet cone:

measuring the static pressure at a first point of the inlet cone;

measuring the static pressure at a second point of the inlet cone different from the first point;

determining the pressure drop between the first and second points;

empirically determining a constant for the inlet cone that is representative of the air flow characteristics of the inlet cone; and

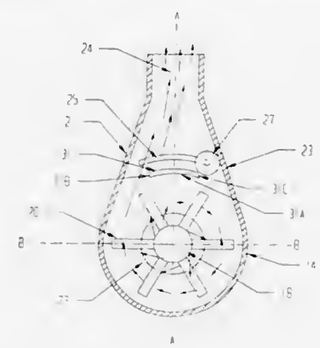
calculating the air flow through the inlet cone.

5,586,862

CENTRIFUGAL PUMP HAVING A SLIDABLE GATE

Michael Danner, 21 North Rd., Stony Brook, N.Y. 11790

Filed Jun. 15, 1995, Ser. No. 490,953
Int. Cl.[6] F04D *29/48*
U.S. Cl. 415—146 **13 Claims**



1. A centrifugal pump, comprising:

a) a pump volute have a substantially axial inlet port and a substantially radial outlet port and being substantially symmetrical about the axis of said outlet port, said outlet port being flanked by a first and second side wall;

b) an impeller rotatably mounted inside said pump volute;

c) a drive motor coupled to said impeller for imparting rotational movement to said impeller; and

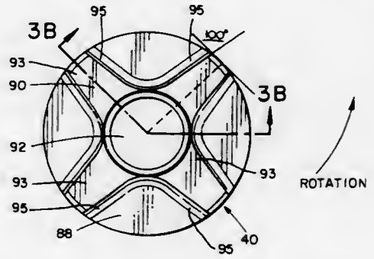
d) slidable gate means mounted between said impeller and said outlet port and including a gate slidably movable between a first position where said gate rests against said first side wall and a second position where said gate rests against said second side wall.

5,586,863

MOLTEN METAL PUMP WITH VANED IMPELLER

Ronald E. Gilbert, Chardon; George S. Mordue, Ravenna, and Chris T. Vild, Cleveland Heights, all of Ohio, assignors to Metaullics Systems Co., L.P., Solon, Ohio

Continuation of Ser. No. 312,327, Sep. 26, 1994, which is a continuation-in-part of Ser. No. 898,043, Jun. 12, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,378
Int. Cl.[6] F04D *7/06*
U.S. Cl. 415—200 **12 Claims**



1. A molten metal pump comprising:

(a) an elongated shaft having first and second ends;

(b) a means for rotating said shaft about an axis in communication with said first end of said shaft;

(c) an impeller disposed adjacent said second end of said shaft;

(d) a pumping chamber housing said impeller, said pumping chamber having a first generally axially directed inlet opening through which molten metal can be drawn and a second generally radially directed outlet opening through which molten metal can be discharged; and,

(e) said impeller comprising an imperforate substantially circular base having a surface facing toward the first end of the shaft, and at least two imperforate vanes connected to and extending substantially perpendicular from said surface and extending radially from said shaft or a hub securing said shaft toward a peripheral portion of said base, said vanes being spaced apart at terminal inlet ends along their entire radial dimension to create an inlet area comprised of the axial opening between adjacent vanes at the terminal ends and an outlet area comprised of the radial opening between adjacent vanes along the axial direction of the vanes, each vane having a leading edge with a distal portion adjacent said peripheral base portion forming an angle of less than about 100° relative to a tangent to said circular base, said tangent being drawn at the center of said vane.

5,586,864

TURBINE NOZZLE DIAPHRAGM AND METHOD OF ASSEMBLY

Victor J. Knorowski, Rexford; George Reluzco; Kenneth J. Robertson, both of Schenectady, and Paul L. Adamkoski, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 280,899, Jul. 27, 1994, abandoned. This application Feb. 27, 1995, Ser. No. 395,357
Int. Cl.[6] F04D *29/44*
U.S. Cl. 415—209.2 **10 Claims**

1. A nozzle diaphragm for use in a turbine comprising:

an outer ring;

an inner web;

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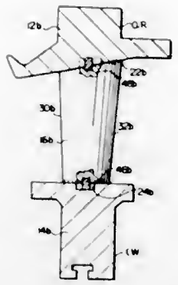


a circumferentially extending locator ring carried by one of said outer ring and said inner web, said locator ring including a plurality of circumferentially spaced holes through and extending between opposite radial sides thereof;

a plurality of partitions connected to and extending between said outer ring and said inner web, each of said partitions having an end adjacent said locator ring and an opening therein; and

a plurality of pins, each said pin being received in and through a hole of said locator ring and extending therefrom into said opening in the end of a partition for locating said locator ring and said partitions.

5,586,865

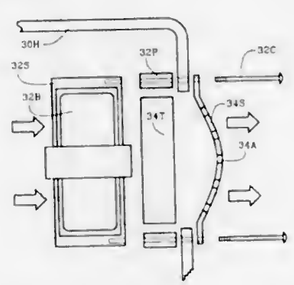
FAN WITH TRANSITION CHAMBER FOR PROVIDING ENHANCED CONVECTIVE FLOW

Ji-Zhong Yin, Fremont, Calif., assignor to Micronics Computers Inc., Fremont, Calif.

Filed Mar. 8, 1996, Ser. No. 613,247

Int. Cl.[6] F04D *29/60*

U.S. Cl. 415—213.1 **26 Claims**



1. Fan for delivering an enhanced cooling air flow, comprising:

fan support means;

fan blade means rotatably mounted within the fan support means defining a transition path therethrough for the cooling air;

stationary screen means positioned adjacent to the blade means traversing the transition path;

transition chamber formed between the screen means and the blade means traversing the transition path and defining a transition gap dimension between the screen means and the blade means, the transition chamber having a screen region adjacent the screen means with the cooling air flow through the screen region and the screen means being generally linear, having a blade region adjacent the blade means with the cooling air flow through the blade region and the blade means having a rotational component, and having a middle region between the screen region and the blade region allowing transition between the linear flow and the rotational component flow;

the fan support means positioned outside the transition chamber to avoid interference with the cooling air transition between the linear flow and the rotational component flow;

fan driver secured to the fan support means for rotating the blade means to propel the cooling air flow; the rotation of the blade means imparting the rotational component to the cooling air flow through the blade region and the blade means; and

spacer means extending between the screen means and the blade means maintaining the transition gap at a dimension sufficient to substantially isolate the linear flow through the screen region from the effects of the rotational component flow through the blade region, for enhancing the cooling air flow.

5,586,866

BAFFLE-COOLED WALL PART

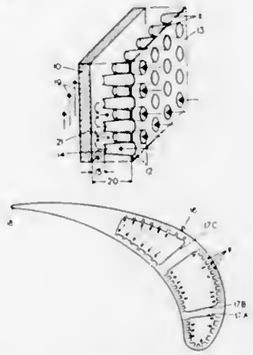
Hans Wettstein, Fislisbach, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Aug. 2, 1995, Ser. No. 510,307

Claims priority, application Germany, Aug. 26, 1994, 44 30 302.5

Int. Cl.[6] F01D *5/18*

U.S. Cl. 416—96 A **15 Claims**



1. A baffle cooling arrangement for wall parts, comprising:

a wall having a wall part to be cooled;

a carrier having an inner and an outer surface, the inner surface of the carrier being arranged at a distance from the wall part; and

a plurality of baffle tubes, the baffle tubes each having an inlet end and an outlet end, the inlet ends of the baffle tubes being arranged over an area on the outer surface of the carrier and the outlet ends of the baffle tubes being directed toward the wall part, the tubes extending into a space between the inner surface of the carrier and the wall part.

5,586,867

DIRECT MOUNTED FAN APPARATUS

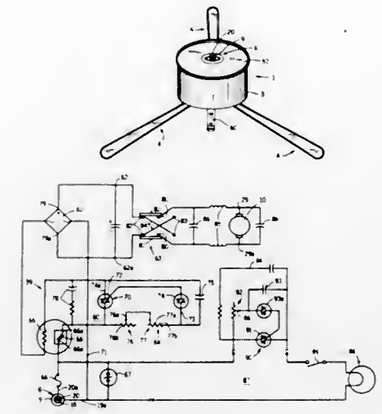
Michael D. Mehlos, Hwy. E, Watertown, Wis. 53094

Filed Jan. 19, 1994, Ser. No. 183,739

Int. Cl.[6] F04B *49/06*

U.S. Cl. 417—45 **5 Claims**

1. A fan unit for direct releasable mounting to a wall mounted power receptacle, comprising a support unit having an electrical connection means adapted to be releasable inserted into said receptacle with a physical and electrical interconnection between said support unit and said receptacle to physically support the fan unit and to connect electrical power to said electrical connector means, a fan blade support structure rotatable secured to said support unit, a plurality of fan blades secured to said fan blade support structure, a small high speed motor unit secured to said support unit, a speed



reducing drive coupling between said motor unit and said fan blade support structure for reducing the speed at said support structure and rotating of said fan blades, an enclosure enclosing said motor and said speed reducing drive coupling to physically support the fan unit and to connect electrical power to said electrical connector means, a control unit mounted within said enclosure and connected to control the speed of said motor and thereby the rotation of said fan blades, and control members secured to said support structure and located beneath said enclosure for ready access, wherein said motor is a permanent magnet D.C. motor and said motor control includes an AC power input, a solid state switching circuit having a power supply connection to said AC power input and including a variable impedance for controlling the turn on of said switching circuit in response to the incoming AC power input, a full wave rectifier connected to the output of said switching circuit and having an output connected to said motor control, and a reversing switch unit interconnected in said connection between the output of said rectifier and said motor for controlling the rotation direction of said motor, and separate movable control members secured to said support structure and extending from the lower portion of said enclosure for ready recess thereto.

5,586,868

METHOD OF DELIVERING LIQUID TO A PATIENT VIA A DISPOSABLE PUMPING CASSETTE HAVING A FLOW CONTROL & PRESSURE MONITORING MEMBER

Michael W. Lawless, Poway; Peter A. Soberon, Cardiff; Ashok Kaul; Steven E. Minick, both of San Diego; Gregory G. Hoerner, Poway; Robert A. Hermann, Chula Vista, and Stephen J. Kreinick, San Diego, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 242,762, May 13, 1994. This application Jun. 25, 1995, Ser. No. 494,986

Int. Cl.[6] F04B *43/02;53/10*

U.S. Cl. 417—53 **12 Claims**

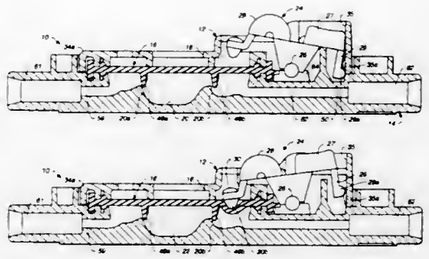
1. A method of delivering a fluid to a patient, comprising the steps of:

a. providing a disposable pumping cassette having a pumping chamber, an inlet valve, and an outlet valve;

b. priming said cassette with the fluid to be administered to the patient;

c. coupling the cassette to an associated pump driver;

d. advancing a plunger of the associated pump driver to force the fluid through the cassette, past the outlet valve, and thus, to deliver the fluid to the patient;



e. providing an auxiliary flow control member on the cassette to control free fluid flow through the cassette and to monitor fluid pressure when the cassette is installed in the pump; and

f. monitoring the pressure of the fluid discharged from said outlet valve.

5,586,869

INITIAL PRESSURE GOVERNOR FOR A VARIABLE DISPLACEMENT PUMP

Hartmut Benckert, Sielmingen, and Werner Muenzenmaier, Nuertingen, both of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Germany

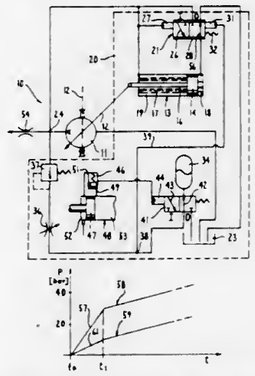
PCT No. PCT/EP92/02880, § 371 Date Jun. 10, 1994, § 102(e) Date Jun. 10, 1994, PCT Pub. No. WO93/12342, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 12, 1992, Ser. No. 244,917

Claims priority, application Germany, Dec. 13, 1991, 41 41 108.0

Int. Cl.[6] F04B *49/02*

U.S. Cl. 417—218 **18 Claims**



1. A pressure governor for regulating the output of a hydraulic displacement pump that generates a pressurized fluid to a hydraulic fluid consuming unit, the pump including an outlet through which the pressurized fluid is discharged and an actuatable control plate for regulating the output of the pump, the control plate having a first position allowing maximum pump output and a second position allowing a minimum pump output, said governor comprising:

a differential-pressure actuated regulator connected to the pump control plate for moving the control plate between the first and second positions, said regulator having opposed first and second chambers, wherein when fluid in said first chamber is pressurized relative to fluid in said second chamber, said regulator moves the pump control plate to the first position and when fluid in said second chamber is pressurized relative to fluid in said first chamber, said regulator moves the pump control plate to the second position;

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a conduit connecting the outlet of the pump to said first chamber of said regulator;

a pressure regulated valve, said pressure regulated valve being connected to the outlet of the pump and said second chamber of said regulator, said pressure regulated valve having:

a valve unit having a first position for connecting said second chamber of said regulator to a discharge port and a second position for connecting the outlet of the pump to said second chamber of said regulator;

a biasing member connected to said valve unit for holding said valve unit in said first position;

a first control chamber connected to the outlet of the pump and to said valve unit wherein, when said first control chamber is provided with pressurized fluid from the outlet of the pump, said valve unit is displaced to said second position so as to allow fluid flow from the pump into said second chamber of said regulator; and

a second control chamber for receiving a restoring fluid wherein, when the restoring fluid is applied to said second control chamber, the pressure of the restoring fluid and said biasing member urge said valve unit from said second position to said first position; and

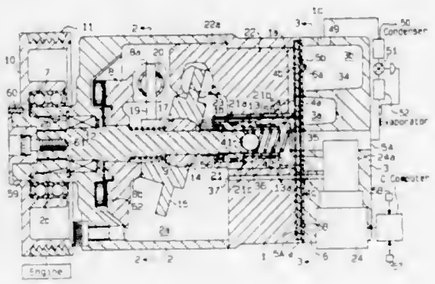
a hydraulic retarder connected between the outlet of the pump and said second control chamber of said pressure regulated valve for supplying pressurized fluid from the pump to said second control chamber as the restoring fluid, wherein said hydraulic retarder is configured to supply the pressurized fluid to said second control chamber at a pressure that increases at a rate slower than the rate at which the pressure of the fluid discharged from the pump increases.

5,586,870

BEARING STRUCTURE USED IN A COMPRESSOR

Masahiro Kawaguchi; Masanori Sonobe; Shigeki Kanzaki, and Tomohiko Yokono, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jul. 19, 1994, Ser. No. 277,347
Claims priority, application Japan, Jul. 20, 1993, 5-179394
Int. Cl.[6] F04B *1/29*
U.S. Cl. 417—222.2 **17 Claims**



1. A compressor comprising a rotary drive shaft having a first end and second end, said first and second ends being rotatably supported by opposing walls of a crank chamber defined in a casing, a disk tiltably mounted on said drive shaft and operably coupled to a plurality of pistons, such that rotation of said drive shaft results in reciprocating movement of said pistons for compressing refrigerant gas in a corresponding plurality of cylinder bores;

said first end of said drive shaft extending outside said casing;

a rotary member continuously coupled to said first end of said drive shaft for directly driving said drive shaft from a driving source;

a rigid support member protruding outwardly from said casing and disposed between said rotary member and said first end of said drive shaft;

a first bearing disposed between said rigid support member and said rotary member for receiving a thrust load and a radial load acting on said rotary member when said rotary member is rotatably driven by said driving source; and

a second bearing disposed between said second end of said drive shaft and the adjacent one of said walls of said crank chamber for receiving a radial load acting on said rotary member when said rotary member is rotated; and

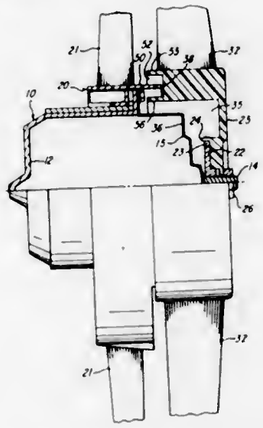
said drive shaft being rotatably supported by only said first and second bearings.

5,586,871

ELECTRIC MOTOR DRIVEN FAN WITH WATER BAFFLE

Steven J. Barnes, Kettering, and Scott R. Spence, New Carlisle, both of Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Filed Jun. 7, 1995, Ser. No. 479,675
Int. Cl.[6] F04B *35/04*
U.S. Cl. 417—423.11 **5 Claims**



1. In an electric motor driven fan for motor vehicle use including an electric fan motor having a motor shaft and a motor housing, a fan hub on said motor shaft spaced from said motor housing and supporting a plurality of fan blades, a motor support bracket by which the fan motor is supported, at least one ventilating aperture formed in said motor housing and opening into the space between the motor housing and said fan hub, the improvement for preventing direct entrance of water into the motor ventilation opening and into the space between said motor housing and said fan hub, comprising:

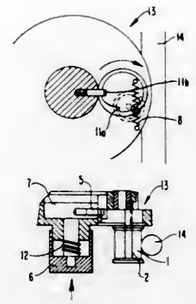
a plurality of axially extending rings including at least one ring mounted concentrically to said motor shaft on said fan hub and extending axially toward said motor housing, and at least one ring mounted on said motor mounting bracket and extending axially toward the other said ring and in overlapping relation thereto and defining between said rings a passage through which air may flow, said annular rings forming a labyrinth-like barrier preventing straight line intrusion of water radially inwardly into said space and ventilating aperture.

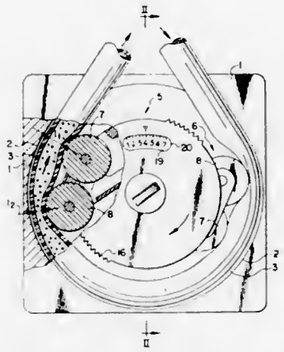
5,586,872

ADJUSTABLE PERISTALTIC PUMP

Valery V. Skobelev, ulitsa Menzhinskogo, 10, kv. 232; Mikhail A. Slivin, prospekt Krasnoyarsky rabochy, 191 A, kv. 36; Evgeny A. Selezov, ulitsa K. Marxa, 88, kv. 37; Viktor G. Kabakov, pereulok Rechnoi, 1, kv. 33, and Gennady S. Puzikov, ulitsa Mechnikova, 12, kv. 61, all of Krasnoyarsk, Russian Federation

PCT No. PCT/RU92/00171, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO94/05345, PCT Pub. Date Mar. 17, 1994
PCT Filed Sep. 2, 1992, Ser. No. 232,096
Int. Cl.[6] F04B *43/08*
U.S. Cl. 417—477.8 **5 Claims**





1. A pump for biological fluids comprising a housing which includes:

a resilient tube for passing through biological fluid, and

an operating head which is rotatable in the direction of fluid transference by pump and which contains at least one roller member for bearing against said tube, wherein:

the at least one roller member comprises at least two rollers placed in series so that a roller of said roller member which is preceding in a direction of the operating head rotation has a greater aperture of said tube for transference in comparise with the roller of the same member which follows, and

the pump is provided with a means for adjusting the degree of compression of said tube using the rollers, said means being mounted in the region of the operating head, wherein,

said means for adjusting the degree of compression of the tube comprises a turnable and retainable eccentric placed coaxially with the operating head and coupled with at least one said roller member.

5,586,873

TUBE PUMP WITH RETRACTABLE ROLLERS

Pavel Novak, Stettemerstr. 117, CH-8207 Schaffhausen, Germany, and Clemens Rebholz, Alte Uhldingerstr. 25, D-7772 Uhldingen/Mühlheim, Germany

Continuation of Ser. No. 363,590, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 77,779, Jun. 18, 1993, abandoned. This application May 22, 1995, Ser. No. 445,954
Claims priority, application Germany, Jun. 18, 1992, 42 20 119.5
Int. Cl.[6] F04B *43/08*
U.S. Cl. 417—477.8 **6 Claims**

1. Tube pump for conveying liquid or viscous media, comprising a pump head on which at least two pump rollers are arranged which latter can be brought into engagement in succession with a tube wherein the medium to be conveyed is contained, in such a way that the medium is transported by squeezing the tube tightly, wherein the pump rollers are displaceable between two end positions, of which one position, pumping position, permits the pumping operation and the other position, park position, permits changing of the tube without manual twisting of the pump head and without displacement of the tube bed; and

a first mechanism which unlocks the pump rollers which are in the pumping position, so that these pump rollers can be converted into the park position.

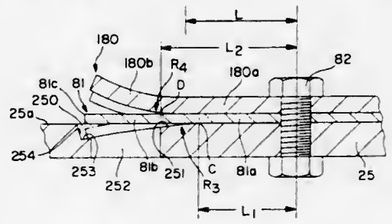
wherein the first mechanism comprises an eccentric disk for each pump roller, this disk being supported in an eccentric disk mounting to be rotatable about an axis, a shaft of the respective pump roller being mounted on this disk eccentrically to the axis, and a release button displacing a release disk in such a way that locking pins supported therein overcome the locking of the eccentric disks so that tension springs tensioned between the eccentric disks and the eccentric disk mounting pull the eccentric disks with the pump rollers supported therein into the park position.

5,586,874

REED VALVE ARRANGEMENT FOR A RECIPROCATING COMPRESSOR

Kenji Hashimoto, Yamada-gun, and Yoshito Matsumura, Setagun, both of Japan, assignors to Sanden Corporation, Japan

Filed Nov. 14, 1995, Ser. No. 555,698
Int. Cl.[6] F04B *53/10*
U.S. Cl. 417—569 **9 Claims**



1. A fluid displacement apparatus comprising:

a housing including a front end plate and a rear end plate;

a valve plate member disposed in said housing and dividing said housing into a first chamber and a second chamber, said second chamber comprising a discharge chamber;

a passage formed in said valve plate member extending between said first chamber and said discharge chamber, said passage having an open end through which discharge fluid flows;

an elastic valve member disposed on said valve plate, said valve member having a spring constant allowing said passage to remain blocked until the pressure in said first chamber exceeds a predetermined value;

a valve retainer member secured by a securing member to said valve plate, said valve retainer member bent away from said

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valve plate member, said valve retainer member limiting bending movement of said valve member; and

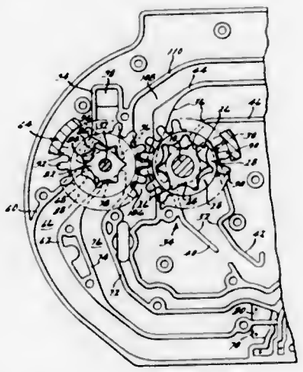
a valve seat formed on said valve plate around the open end of said passage, said valve seat comprising a recess formed in said valve plate, said recess including a surface inclined with increasing depth in the radial direction of said valve plate, said inclined surface beginning at a point radially outside said securing member, point at which said valve retainer member is bent being radially outside said point where said inclined surface begins.

5,586,875

ASSEMBLY OF ROTARY HYDRAULIC PUMPS

Richard T. Ondrejko, Highland; Paul J. Castiglione, Milford, and Robert J. Miller, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 10, 1995, Ser. No. 500,376
Int. Cl.[6] F01C *1/36*
U.S. Cl. 418—3 **9 Claims**



1. A pump assembly, comprising:

a first rotary pump having

an inlet port,

an outlet port,

a first outer rotor formed with external gear teeth and internal lobes,

a first inner rotor having external lobes intermeshing with the internal lobes of the first outer rotor;

a second rotary pump having

an inlet port,

an outlet port,

a second outer rotor formed with external gear teeth meshing with the gear teeth of the first outer rotor, and internal lobes,

a second inner rotor having external lobes intermeshing with the internal lobes of the second outer rotor;

a gear pump having an inlet and outlet located adjacent the intermeshing gear teeth;

a reservoir connected to the outlet of the first rotary pump and to the inlet of the second rotary pump, and adapted to hold fluid in communication with the external gear teeth of the first and second outer rotors;

a housing containing the first and second rotary pumps; and

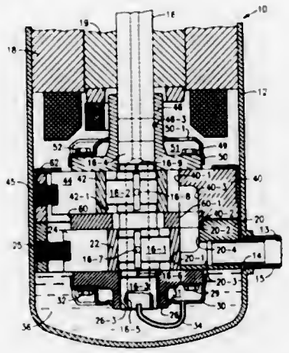
a passage plate defining suction and pressure passages leading to the inlet ports and outlet ports of the first and second rotary pumps and the gear pump.

5,586,876

ROTARY COMPRESSOR HAVING OIL PUMPED THROUGH A VERTICAL DRIVE SHAFT

Donald Yasnnascoll, Manlius, N.Y., and Alexander D. Leyderman, Frederick, Md., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 3, 1995, Ser. No. 552,662
Int. Cl.[6] F04C *18/356;23/00;29/02*
U.S. Cl. 418—60 **6 Claims**



1. A vertical, high side, hermetic rotary compressor means comprising:

shell means;

pump assembly means located in said shell means;

motor means located in said shell means above said pump assembly means;

shaft means rotatably driven by said motor means and extending downwardly through said pump assembly means into an oil sump located in the bottom of said shell means;

said shaft means coacting with said pump assembly means to cause said pump assembly means to compress gas and including oil distribution means extending from said oil sump;

said oil distribution means including means for pumping oil from said sump into said oil distribution means;

bearing means secured to said pump assembly means and supportingly receiving said shaft means;

muffler means secured to said bearing means and coacting therewith to define a chamber in fluid communication with said pump assembly means via discharge valve means whereby gas compressed in said pump assembly means is supplied to said chamber;

a first fluid path for directing a majority of the compressed gas supplied to said muffler means into said shell means;

a second fluid path for directing a minor amount of the compressed gas supplied to said muffler means into said oil distribution means whereby the compressed gas passing into said oil distribution means coacts with said oil from said sump to produce a jet pump effect assisting to supply oil from said sump to said oil distribution means.

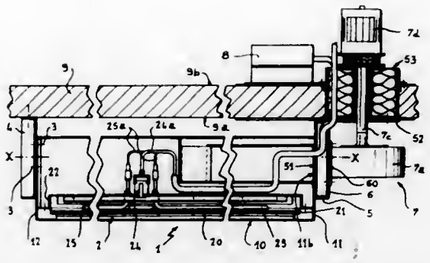
5,586,877

INFRARED RAY EMITTERS WITH CATALYTIC BURNER

Michel Charmes, Lyons, France, assignor to A.J.C., Sathonay Camp, France

Filed Jul. 20, 1995, Ser. No. 504,946
Int. Cl.[6] F23D *14/12*
U.S. Cl. 431—115 **7 Claims**

1. An infrared ray emitter having a catalytic burner which is adapted to be installed within a furnace, the infrared ray emitter comprising; a box having a plurality of faces defining an interior chamber and opposite first and second end walls, one of said faces defining an opening from said interior chamber of said box, a



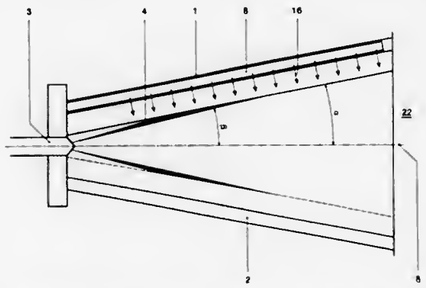
catalytic material structure mounted within said opening, means for injecting a combustible gas mounted within said chamber adjacent said catalytic material structure, a turbine means mounted to said box for introducing a combustion supporting gas under pressure into said chamber so as to distribute said combustion supporting gas over said catalytic material structure, motor means for driving said turbine means, said second end wall of said box including an inlet opening for receiving combustion supporting gas under pressure from said turbine means, electrical preheating means mounted within said chamber and adjacent said catalytic material structure for pre-heating said catalytic material structure, first and second spaced bracket members for supporting said box within the furnace, said second bracket member including an opening aligned with said inlet opening in said second end wall of said box and means for mounting said turbine means to said second bracket, whereby gas within the furnace is introduced into said interior chamber by said turbine means and thereafter exhausted from said interior chamber through said catalytic material structure and into said furnace whereby said gas within the furnace is recycled through said infrared emitter.

5,586,878

PREMIXING BURNER

Klaus Döbbeling, Nussbaumen; Johannes Santner, and Christian Steinbach, both of Neuenhof, all of Switzerland, assignors to ABB Research Ltd., Zurich, Switzerland

Filed Nov. 2, 1995, Ser. No. 552,088
Claims priority, application Germany, Nov. 12, 1994, 44 40 558.8
Int. Cl.[6] F23D *14/46*
U.S. Cl. 431—351 **8 Claims**



1. A premixing burner of the double-cone design for operating an internal combustion engine, a combustion chamber of a gas-turbine group, or a firing plant, the burner comprising:

at least two hollow conical sectional bodies positioned to enclose a conical interior space that widens in a direction of flow at a cone half angle which is constant in the direction of flow, longitudinal symmetry axes of the sectional bodies being parallel to a longitudinal axis of the burner and mutually offset to define opposed tangential flow air-inlet slots on opposite sides of the interior space for a combustion-air flow,

a nozzle for atomizing a liquid fuel arranged in a narrowest cross section of the conical interior space, the nozzle being directed for fuel injection at an acute angle to the longitudinal axis of the burner,

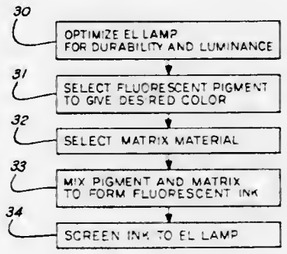
wherein the nozzle is a high-pressure atomization nozzle comprising a nozzle body having at least one feed passage for delivering liquid fuel to be atomized at a pressure greater than 100 bar, and at least two nozzle bores to spray fuel droplets into the interior space of the burner, wherein the nozzle bores are aligned with zones of high air velocity in the burner interior space, and the acute angle between the fuel-droplet spray and the longitudinal axis of the burner is at least as large as the cone half angle between the sectional cone bodies and the longitudinal axis of the burner.

5,586,879

FLUORESCENT ELECTROLUMINESCENT LAMP

Archana Szpak, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 270,331, Jul. 5, 1994, abandoned. This application Dec. 20, 1995, Ser. No. 575,267
Int. Cl.[6] H05B *33/02*
U.S. Cl. 445—24 **1 Claim**



1. A method of providing an electroluminescent lamp structure comprising the steps of:

providing an electroluminescent lamp having a phosphor selected to optimize lamp durability and luminance without regard to the color of light produced by said phosphor;

selecting a fluorescent pigment to modify light produced by said phosphor in said optimized electroluminescent lamp to a desired color by absorbing a portion of light emitted by said phosphor and re-emitting light by fluorescence to produce said desired color;

mixing said selected fluorescent pigment with a matrix material to form an ink; and

applying said ink to said electroluminescent lamp.

5,586,880

HEAT TREATMENT APPARATUS AND HEAT TREATMENT BOAT

Tetsu Ohsawa, Tokyo, Japan, assignor to Tokyo Electron Limited, and Tokyo Electron Tohoku Limited, both of Japan

Continuation of Ser. No. 184,915, Jan. 24, 1994, abandoned. This application May 30, 1995, Ser. No. 452,505
Claims priority, application Japan, Jan. 27, 1993, 5-031315
Int. Cl.[6] F23D *3/12*
U.S. Cl. 432—241 **13 Claims**

1. A heat treatment apparatus for heat-treating substrates to be treated, comprising:

a heat treatment furnace for housing and heat-treating said substrates; and

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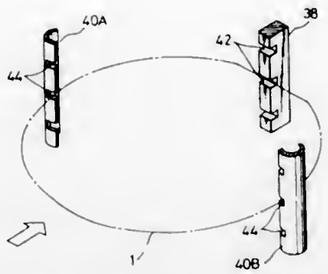
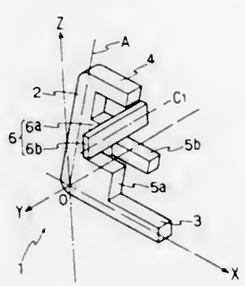


boat means for supporting said substrates and transporting said substrates into said heat treatment furnace, and comprising a bottom plate, a top plate and three support rods which are disposed at predetermined intervals from one another along an outer peripheral edge of each of said substrates housed in said boat means, said three support rods including a first support rod having a rectangular cross section supporting each of said substrates at an orientation flat, and a second and a third support rod provided on both sides of said first support rod, each of said second and third support rods being a hollow substantially halved tube having an arcuated cross section defined by curved outer and inner surfaces, each of said first, second and third support rods having notched grooves, and each formed with a lower face on which a corresponding one of said substrates sits.

5,586,881
INDICATOR FOR USE IN FIXING A DEVICE FOR CORRECTING TEETH IRREGULARITIES TO A SURFACE OF EACH TOOTH
Kunio Chikami, 211-1, Minamikuma, Kochi-shi, Kochi-ken, Japan, assignor to Kunio Chikami, Kochi, Japan
Filed Nov. 21, 1994, Ser. No. 345,418
Claims priority, application Japan, Jul. 25, 1994, 6-172190
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—3 **5 Claims**



1. An indicator for using in setting a device for teeth irregularities comprising a wire extending along with a dentition, a bracket in which said wire is inserted, said bracket being fixed to a surface of each tooth in a manner that a pillow-shaped base plate is interposed between said bracket and said surface, said indicator comprising:

a backbone member extending along a longitudinal axis in said tooth;

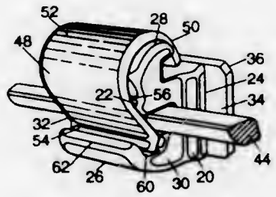
a leg member connected with a lower end of said backbone member;

a first arm member connected with an upper end of said backbone member, said first arm member extending parallel to said leg member;

a means for carrying said bracket in a slidable manner, said means being connected with said backbone member at an intermediate portion of said backbone member; and

at least one second arm member connected with said backbone member at an intermediate portion between a position where said means for carrying said bracket is connected and another position where said leg member is connected, said second arm member extending parallel to said leg member, wherein in a state where the indicator is slidably provided with the bracket that the pillow-shaped base plate is adhered to the bracket, the pillow-shaped base plate is contacted with the tooth and each free end of the first arm member and second arm member contact the tooth.

5,586,882
SELF-LIGATING ORTHODONTIC BRACKETS
G. Herbert Hanson, 57 Augusta Street, Hamilton, Ontario, Canada
Filed Jul. 12, 1994, Ser. No. 274,077
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—13 **30 Claims**



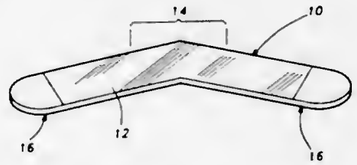
1. An orthodontic bracket comprising:

a bracket body having labial, lingual, gingival, occlusal, mesial and distal surface portions, and having a mesial distal extending arch wire slot opening to the labial surface portion; and

a generally U-shaped ligating spring member of thin resilient material having labial and lingual portions in embracing sliding engagement with corresponding labial and lingual surface portions of the body, the ligating spring member being movable on the body between two positions in which the slot labial opening is respectively open and closed;

wherein the ligating spring member is of a superelastic shape recovery metal alloy.

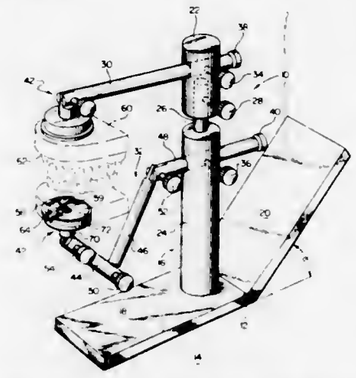
5,586,883
GOLD-PLATED DENTAL MATRIX BAND
Robert G. Nakisher, 1212 N. LaSalle #1301, Chicago, Ill. 60610, and Daniel Uditsky, 1516 E. Flemming Dr. N., Arlington Heights, Ill. 60004
Filed Mar. 6, 1995, Ser. No. 398,540
Int. Cl.[6] A61C *5/04*
U.S. Cl. 433—39 **17 Claims**



1. A dental matrix band, comprising:

a body portion that is made from a foil-like metal have a central tooth circumscribing portion extending between and merging with a pair of arms adapted to generally surround a preselected tooth; and a layer of gold disposed on said body portion such that said layer of gold extends over said central tooth circumscribing portion.

5,586,884
DENTAL ARTICULATOR
Richard F. Kraus, 3 Oakbrook Club Dr., #D 106, Oakbrook, Ill. 60521
Filed Aug. 26, 1994, Ser. No. 296,736
Int. Cl.[6] A61C *11/00*
U.S. Cl. 433—60 **16 Claims**



1. A dental articulator for mounting molded casts of teeth having a mounting surface and defining an occlusal plane, said articulator comprising:

a. a base platform for stabilizing the articulator in a first position on a work surface;

b. a longitudinal support column securely attached to the base platform;

c. upper and lower support arms of predetermined length operatively connected with the support column;

d. at least one quick-release coupling for mounting a cast on a support arm such that the cast is firmly mounted and quickly removable,

e. wherein said quick-release coupling further comprises a first member mounted directly to the mounting surface of said cast, and a second member connected to said support arm, said connection occurring along a connecting plane parallel to said occlusal plane, said coupling allowing for fully traversable and rotational adjustmental movement of the mounted cast in and along said connecting plane.

5,586,885
DENTAL FILE/REAMER INSTRUMENT
Jimmie Kert, Norrevaenget 76, DK-3500 Vaerlose, Denmark
Filed May 4, 1995, Ser. No. 431,646
Int. Cl.[6] A61C *5/02*
U.S. Cl. 433—102 **8 Claims**

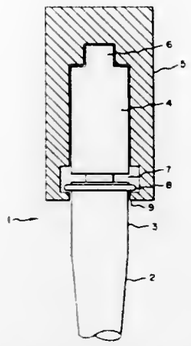
1. In combination, a dental reamer/file instrument and a rotary drive member, said combination comprising:

said dental reamer/file instrument including

a shank for releasably attaching the instrument to a rotary drive member,

a body having a working part with projections for cutting, abrading and/or shaping a root canal of a tooth undergoing endodontic treatment,

an intermediate part connecting said shank to said body, such as being formed integrally therewith,



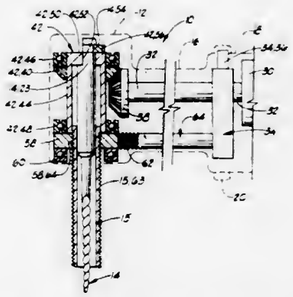
wherein said intermediate part comprises a part having a torsional fracture strength substantially less than that of said body, and

a first projection protruding radially outward and situated between said part having a reduced torsional strength and said body;

said rotary drive member including

a second projection protruding radially inward and located towards a proximal end of said body yet distally of said radially outwardly protruding projection on said intermediate part of said dental reamer/file instrument so as to allow relative rotation but not relative movement in an axial direction when said instrument is operatively connected to said drive member.

5,586,886
ROTARY HANDPIECE FOR ENDODONTIC INSTRUMENTS
James B. Roane, 707 SW. 24th St., Suite 201, Norman, Okla. 73069
Filed Aug. 30, 1995, Ser. No. 520,992
Int. Cl.[6] A61C *5/02;1/10;3/00*
U.S. Cl. 433—224 **20 Claims**



1. In a rotary handpiece for cleaning and enlarging a root canal of a tooth having a rotary endodontic file, said handpiece having a rotary drive which rotates a chuck for holding and rotating the endodontic file, the improvement which comprises:

a retractable support rod attached to and extending from said handpiece positioned adjacent and substantially parallel to said endodontic file and adapted to rest on a tooth whereby the retraction of said support rod controls the advance of said endodontic file into said root canal; and

means attached to said handpiece and to said support rod for retracting said support rod and advancing said endodontic file at a controlled rate into said root canal whereby said endo-

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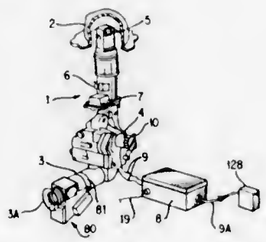
dontic file does not become excessively loaded while said root canal is being cleaned and enlarged.

5,586,887
HOWITZER STRAP-ON KIT FOR CREW PERFORMANCE EVALUATION AND TRAINING METHOD

Niall B. McNelis, Baltimore; Richard W. Doyle, Fallston; Dale A. Clark, Parkton; Larry A. Zeafla, Baltimore, and Thomas P. McGrath, Lutherville, all of Md., assignors to AAI Corporation, Hunt Valley, Md.

Filed Nov. 23, 1994, Ser. No. 346,289
Int. Cl.[6] F41G *3/26*
U.S. Cl. 434—20 **22 Claims**



22. A training method for remotely and substantially instantaneously evaluating the aiming alignment, settings and levels set by a crew training on a howitzer gun, comprising:

(1) manually removably attaching to a pantel of the gun a video means for receiving a sight picture in the pantel or for displaying a synthetic sight picture in a pantel eyepiece;

(2) manually removably attaching to a pantel deflection setting means a pantel deflection setting encoder for encoding signals responsive to a pantel deflection setting;

(3) manually removably attaching to the pantel a pantel level encoder for encoding signals responsive to a pantel level;

(4) manually removably attaching to a quadrant setting means a quadrant setting encoder for encoding signals responsive to a quadrant setting;

(5) manually removably attaching to a quadrant a quadrant level encoder for encoding signals responsive to a quadrant level; and

(6) receiving in a data processing computer said sight picture, or the data processing computer displaying and controlling the synthetic sight picture in a pantel eyepiece, and receiving in the data processing computer said signals for evaluation of the alignment, settings and levels.

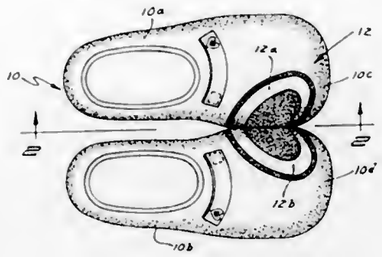
5,586,888
METHOD OF ADAPTING A PAIR OF CHILDREN'S SHOES

Marlene K. Webb, 335 Lee Ave. So. Box 495, Cokato, Minn. 55321

Filed Jul. 10, 1995, Ser. No. 500,458
Int. Cl.[6] G09B *19/00*
U.S. Cl. 434—258 **1 Claim**

1. A method for adapting a child's pair of shoes to indicate to the child which shoe is for the left foot and which is for the right foot consisting of the steps of

positioning a pair of a child's shoes to have side-by-side engagement corresponding to the feet upon which they are worn,

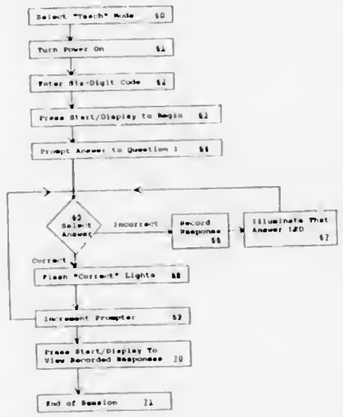


overlying adjacent engaging toe and side wall portions portions of said shoes with a design of a figure readily recognizable as a whole design by a child which tells the child the shoes are properly positioned to be put on the corresponding feet, and when said shoes are otherwise positioned, said figure is separated and meaningless telling the child that the shoes have to be otherwise positioned relative to each other to form of a whole design.

5,586,889
HAND HELD TEACH AND TEST DEVICE

Milton Goodman, 160-06 65TH Ave., Flushing, N.Y. 11365

Filed Sep. 22, 1994, Ser. No. 310,889
Int. Cl.[6] G09B *3/00*
U.S. Cl. 434—327 **18 Claims**



1. A hand-held device for selecting one of a plurality of sets of internally-stored answers and recording individual responses for comparison to the selected set of answers, each set of answers having an identification code, a plurality of separate sets of questions being freely creatable for each set of answers, the device comprising: select one of said plurality of sets of internally-stored answers;

an indicator for serially prompting for individual responses to a separate set of questions corresponding to the selected set of answers;

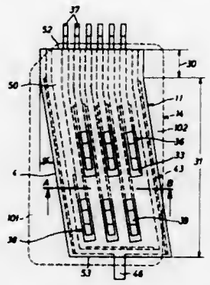
response means for registering a response for each question; and

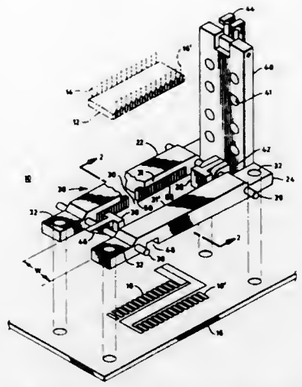
recording means for comparing the responses to the answers and recording the number of correct and incorrect responses given.

5,586,890
CONTACTING APPARATUS FOR A CHIPCARD

Gerhard Braun, Erlenbach, Germany, assignor to Amphenol-Tuchel Electronics GmbH, Germany

PCT No. PCT/EP93/03618, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO94/15313, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 20, 1993, Ser. No. 284,660
Claims priority, application Germany, Dec. 18, 1992, 42 43 076.3
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—66 **32 Claims**





1. An apparatus for establishing electrical connection between a chipcard and a printed circuit board, said apparatus comprising:

means, arranged on said circuit board, for contacting said chipcard, said means including a support containing a plurality of contact elements for facilitating electrical contact between said contact elements and said chipcard, said support performing the function of supporting said contact elements in a manner that will increase the available space on said printed circuit board and wherein said support has a width which is narrower than the width of the chip card and said support further comprises a parallelogram-shaped section and a rectangular-shaped section wherein the sides of the support in the parallelogram-shaped section are inclined with respect to the sides of the support in the rectangular section; and

guide means, spaced from the support, for guiding the chipcard onto the support.

tion to one another, each said conductive member configured such that said lead portion physically engages said resilient strip mating surface and said contact portion physically engages said resilient strip contact surface; whereby said conductive member contact portion electrically engages the contact pads when said base frame lower surface is positioned against the printed circuit board, and placement of the electronic module into said base frame opening positions each electronic module external lead proximate said resilient strip mating surface and places each electronic module external lead into adjacent parallel relationship with at least one said conductive member lead portion to establish electrically conductive paths between the electronic module external leads and the printed circuit board via the contact pads.

5,586,891
ELECTRICAL SOCKET FOR HIGH-FREQUENCY APPLICATIONS

Gary P. Pirani, Shrewsbury; Alan M. Gulachenski, West Millbury, and David J. Kelly, Worchester, all of Mass., assignors to Electronic Designs Inc., Westborough, Mass.

Filed May 4, 1994, Ser. No. 237,676
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—71 **16 Claims**

1. An electrical socket, suitable for electrically interconnecting an electronic module having external lea& with a printed circuit board having contact pads, said electrical socket comprising:

a base frame, having an upper surface, a lower surface, and an opening therethrough generally conforming to the body shape and size of the electronic module, said opening defining an inner surface extending between said upper surface and said lower surface;

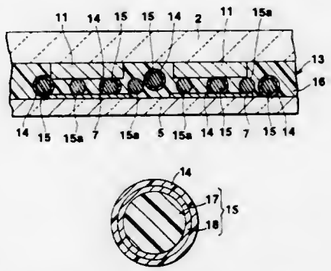
at least one resilient strip, coextensive with at least a portion of said inner surface, said resilient strip comprising a mounting surface for engaging said base frame inner surface, a mating surface for engaging the electronic module external leads, a contact surface essentially coplanar with said base frame lower surface, and a retaining surface; and,

a plurality of conductive members, each comprising a lead portion and a contact portion, said conductive members strayed upon said resilient strip in generally parallel disposi-

5,586,892
ELECTRICALLY CONNECTING STRUCTURE

Minoru Sato, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 397,919
Claims priority, application Japan, Mar. 10, 1994, 6-065417
Int. Cl.[6] H01R *4/04*
U.S. Cl. 439—91 **20 Claims**



1. An electrically connecting structure, comprising:

a first electronic part having a first connecting terminal;

a second electronic part having a second connecting terminal which is arranged to face said first connecting terminal of said first electronic part; and

an anisotropic conductive adhesive arranged between said first connecting terminal and said second connecting terminal, said anisotropic conductive adhesive including:

an insulating adhesive,

a plurality of first conductive particles which are covered with an insulating layer, and

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a plurality of second conductive particles which are not covered with any material,

said first conductive particles and said second conductive particles having substantially the same size,

portions of said insulating layer covering said first conductive particles being brought into contact with said first connecting terminal and said second connecting terminal, and being broken away, under a force which is applied to said first connecting terminal and said second connecting terminal, so that said first conductive particles are brought into contact with said first connecting terminal and said second connecting terminal,

said second conductive particles being brought into contact with said first connecting terminal and said second connecting terminal under the force which is applied to said first connecting terminal and said second connecting terminal, and

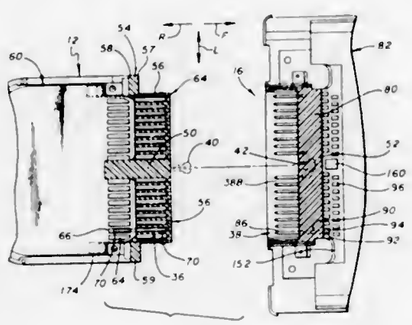
said first connecting terminal and said second connecting terminal being electrically connected to each other through said first conductive particles and said second conductive particles.

5,586,893

IC CARD CONNECTOR SHIELD GROUNDING

Rene Mosquera, Laguna Niguel, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 17, 1995, Ser. No. 503,025
Int. Cl.[6] H01R *13/648*
U.S. Cl. 439—108 **8 Claims**



1. A plug connector for mating with a receptacle connector, comprising:

a dielectric plug connector housing which is elongated in a lateral direction and which has laterally spaced opposite side walls;

a plurality of plug contacts arranged in at least one laterally extending row and mounted on said housing;

a circuit board attached to said housing, said circuit board having a board front portion and having at least one laterally-extending row of conductive contact traces on said board front portion, said contacts having tails joined to said contact traces, said circuit board also having at least one ground trace;

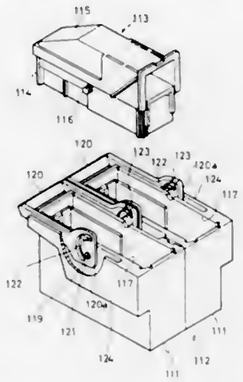
each of said housing opposite side walls has a recess facing away from said row of contacts, and including a pair of plug ground members each having a forward terminal portion lying in one of said housing recesses with each of said forward terminal portions having a contact part extending in a bend that projects laterally beyond adjacent portions of the corresponding housing side wall, and with each plug ground member having a rear portion joined to one of said circuit board ground traces.

5,586,894

MULTIPLE LEVER CONNECTOR ASSEMBLY

Osamu Taniuchi, and Nakata Hiroyuki, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie Pref., Japan

Filed Nov. 17, 1994, Ser. No. 343,898
Claims priority, application Japan, Nov. 18, 1993, 5-066819 U; Nov. 18, 1993, 5-066820 U; Nov. 19, 1993, 5-066836 U
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—157 **10 Claims**



1. A connector assembly comprising:

a) a plurality of first connector housings forming male terminal accommodating cavities, each said housing having opposite side walls;

b) a plurality of second connector housings forming female terminal accommodating chambers;

c) a lever support shaft protruding outwardly from each of said first connector housing side walls;

d) a plurality of operating levers each straddling one of said first connector housings and each having two bearing holes into which said lever support shafts are fitted for rotatably mounting said operating levers on said first connector housings

e) a plurality of cam projections provided on each of said second connector housings and engaging said levers to displace said first and second connector housings by cam action of said operating levers in a coupling direction and in an uncoupling direction; and

f) a coupling member coupling said first connector housings to one another so that said first connector housings are arranged side by side with a predetermined clearance between adjacent surfaces of said operating levers, said clearance being smaller than a depth of fit between said lever support shafts and said respective operating lever bearing holes.

5,586,895

POWER TRANSFER HINGE

Raymond E. Zehrung, 3029 Cameron Way, Santa Clara, Calif. 95051

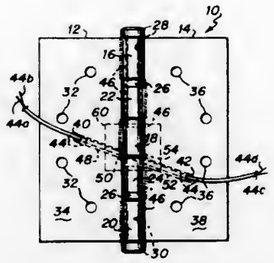
Filed Oct. 23, 1995, Ser. No. 546,586
Int. Cl.[6] H01R *35/04*
U.S. Cl. 439—165 **14 Claims**

1. A power transfer hinge comprising:

a first hinge leaf having a first rear surface having a first recess and at least two first knuckles having bores axially aligned to a common bore;

a second hinge leaf having a second rear surface having a second recess and at least two second knuckles, interleaved with said first knuckles, having bores axially aligned to said common bore;

a pair of pins, disposed in said common bore, for pivotally engaging said first and second hinge leaves;



a first passageway entering said common bore through a first opening and connecting said common bore to said first recess;

a second passageway entering said common bore through a second opening and connecting said common bore to said second recess, the second passageway and the first passageway having a common center line for entering said common bore; and

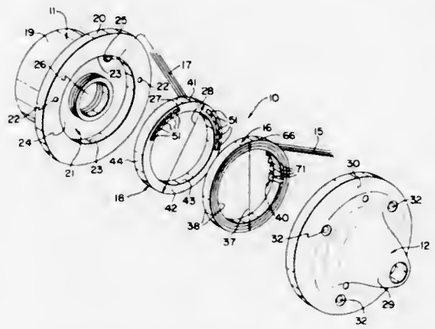
a cable passing through said first recess, the first passageway, said common bore, the second passageway, and the second recess.

5,586,896

HEATER RING CONNECTOR ASSEMBLY

Daniel T. Casey, Harrisburg, and Brent D. Yohn, Newport, both of Pa., assignors to The Whitaker Corporation, Wilmingtoo, Del.

Filed Jan. 11, 1995, Ser. No. 371,243
Int. Cl.[6] H01R *23/68*
U.S. Cl. 439—218 **14 Claims**



1. A connector assembly comprising a pair of rings including a first ring defined by a first insulative ring housing and having an annular periphery provided with a plurality of circumferentially-spaced plug contacts, and a second ring defined by a second insulative ring housing and having an annular periphery provided with a like plurality of circumferentially-spaced receptacle contacts receiving the plug contacts on the first ring:

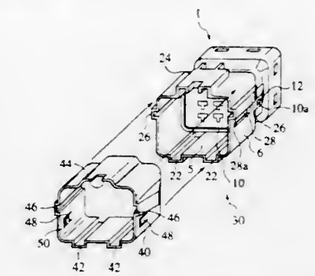
said second ring having a pair of adjacent segments, one of the segments having said like plurality of circumferentially-spaced receptacle contacts, and the other of the segments having a second plurality of circumferentially-spaced receptacle contacts equal in number to said like plurality, said receptacle contacts in one segment being equal in number to all of the plug contacts on said first ring, such that the plug contacts on the first ring may be received in either plurality of receptacle contacts on the second ring upon mating.

5,586,897

WATERPROOF CONNECTOR

Yasuhisa Shinji, and Hiraji Takase, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 22, 1995, Ser. No. 518,138
Claims priority, application Japan, Aug. 25, 1994, 6-200734
Int. Cl.[6] H01R *13/52*
U.S. Cl. 439—271 **5 Claims**



1. A waterproof connector (**1**), comprising:

a connector housing (**30**) having an opening (**5**) engaged with a mated connector housing;

a packing (**10**) disposed within the opening of said connector housing, for sealing a space between the two mated connector housings, at least one part (**10***a*) of said packing being exposed outside through at least one hole (**12**) formed in said connector housing; and

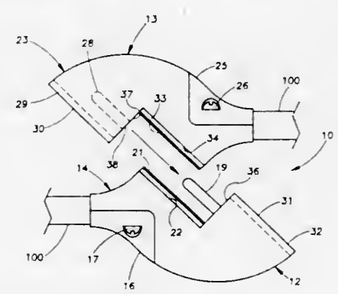
a protective cover (**40**) selectively attached to said connector housing from the outside at need, for covering at least one exposed part (**10***a*) of said packing according to a required degree of connector waterproof characteristics.

5,586,898

SELF LOCKING MALE AND FEMALE CONNECTORS FOR ELECTRICAL CORDS

Dennis R. Anderson, and Katherine D. Anderson, both of 1952 Rainbow Ridge, Corona, Calif. 91720

Filed Nov. 25, 1994, Ser. No. 344,970
Int. Cl.[6] H01R *13/28*
U.S. Cl. 439—287 **2 Claims**



1. An electrical connector apparatus for an electrical cord comprising:

(a) a male connector;

(b) said male connector comprising:

a first housing;

a first wiring chamber in the first housing;

a first wiring chamber cover removably covering the first wiring chamber and removably connected to the first housing;

a plurality of first wiring terminals in the first wiring chamber;

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a plurality of connector prongs electrically connected to the first wiring terminals;

the connector prongs partially extending outside the first housing; and

a first T-shaped longitudinal locking foot attached to a first outer surface of the first housing;

(c) a female connector removably attached to the male connector; and

(d) said female connector comprising:

a second housing;

a second wiring chamber in the second housing;

a second wiring chamber cover removably covering the second wiring chamber and removably connected to the second housing;

a plurality of second wiring terminals in the second wiring chamber;

a plurality of prong receptors, to removably receive the connector prongs, electrically connected to the second wiring terminals;

the prong receptors in the second housing; and

a first T-shaped longitudinal locking channel attached to a second outer surface of the second housing to slidingly and removably receive the first T-shaped longitudinal locking foot;

(e) a second T-shaped longitudinal locking foot attached to a fourth outer surface of the second housing to slidingly and removably receive the first T-shaped longitudinal locking channel; and

(f) a second T-shaped longitudinal locking channel attached to a third outer surface of the first housing to slidingly and removably receive the second T-shaped longitudinal locking foot on the second outer surface of the second housing.

5,586,899

ELECTRICAL TERMINAL

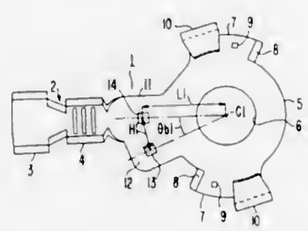
Naohisa Okada, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Feb. 28, 1995, Ser. No. 397,683

Claims priority, application Japan, Mar. 1, 1994, 6-056733

Int. Cl.[6] H01R *13/28*

U.S. Cl. 439—287 **15 Claims**



1. An electrical terminal having a stud connection region with an aperture therein, a wire connection region for connection to an electrical wire, and a neck region connecting the stud connection region and the wire connection region, the stud connection region having angularly spaced latch members arranged such that said electrical terminal is engageable with an identical, overlying electrical terminal upon relative rotation of said electrical terminals about said aperture to form an integrated terminal assembly, wherein said neck region includes angularly spaced male and female lock members in a generally planar surface, one of which is engageable with the other one of a male and female lock member of the overlying electrical terminal to prevent decoupling of the electrical terminals on engagement of said latch members.

5,586,900

CONNECTOR TERMINAL TEST JIG

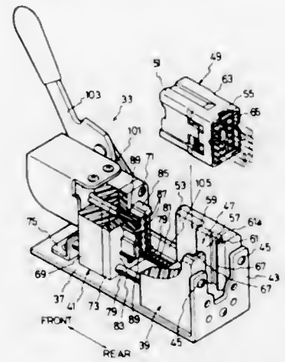
Sakai Yagi; Masanori Tsuji; Motohisa Kashiyama, and Takayoshi Endo, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 27, 1995, Ser. No. 432,426

Claims priority, application Japan, May 9, 1994, 6-095083

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—310 **7 Claims**



1. A connector terminal conduction test jig for testing conduction of terminals (35) of a connector (49) having a engaging member (65) engaged with a connector housing (55) thereof, which comprises:

a connector support member (39) for supporting the connector (49) to be tested;

a test body member (69) disposed movably toward and away from said connector support member and formed with a plurality of through holes (77) each for supporting a terminal conduction test pin (89) movably therein;

a contact plate member (73) attached to said test body member and composed of a contact surface (83) and a fitted contact projection (85) formed with a plurality of test pin accommodating holes (87) each communicating with each through hole (77) of said test body member; and

when said test body member (69) is moved toward said connector support member (39), the fitted contact projection (85) being first inserted into the connector housing (55) so that the contact surface (83) of said contact plate member (73) urges the connector housing (55) toward said connector support member (39) to correctly engage the engaging member (65) with the connector housing (55), and after that terminal ends (35*a*) of the terminals (35) arranged in the connector housing being inserted into the test pin accommodating holes (87) of the fitted contact projection (85) into contact with the terminal conduction test pins (89) in the test body member (69) for terminal conduction test.

5,586,901

CONNECTOR ASSEMBLY WITH COOPERATING TERMINALS AND METHOD FOR CONNECTING SAME

Junji Muta, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Nov. 30, 1995, Ser. No. 565,579

Claims priority, application Japan, Dec. 7, 1994, 6-331121

Int. Cl.[6] H01R *13/64*

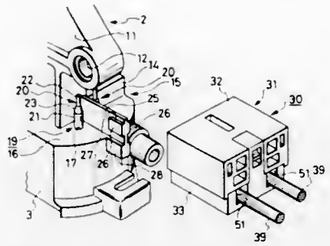
U.S. Cl. 439—342 **25 Claims**

1. A connector assembly comprising:

male and female housings;

at least one male terminal and at least one female terminal mounted on the male and female housings, respectively;

the at least one male terminal having a distal end portion narrower than a proximal end portion thereof;



the at least one female terminal comprising:

a connection portion that resiliently fits on an outer periphery of the proximal end portion of the at least one male terminal,

an insertion groove formed in a side of the connection portion, the insertion groove being adapted to temporarily hold the distal end portion of the at least one male terminal and allowing the distal end portion to pass therethrough into the connection portion, and

guide portions that guide the distal end portion of the at least one male terminal into the insertion groove, the guide portions being formed respectively on opposite side edges of the insertion groove;

wherein the at least one female terminal is connected to the at least one male terminal by inserting the at least one female terminal in a direction intersecting a longitudinal axis of the at least one male terminal, with the distal end portion of the at least one male terminal being passed through the insertion groove, and the at least one female terminal being inserted in a direction along the longitudinal axis of the at least one male terminal.

5,586,902

ELECTRIC CONNECTOR

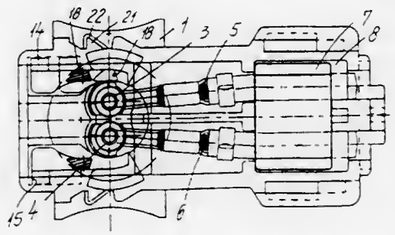
Gustav Hopf, Schnaittach, and Helmut Steinhardt, Nürnberg, both of Germany, assignors to Framatome Connectors International, Paris, France

Filed May 24, 1994, Ser. No. 247,998

Claims priority, application Germany, May 25, 1993, 43 17 344.6

Int. Cl.[6] H01R *13/73*

U.S. Cl. 439—352 **7 Claims**



1. Electric connector between a generator and an electronic controller for housing socket inflatable motor vehicle airbags, said connector comprising a housing for contact tubes with leads, wherein said housing in a coupling position lifts a jumper, disposed in a receptacle for generator-sided plug pins, from said plug pins, said housing further comprising hook-shaped spring elements attached to said housing, and engaging with recesses in said generator, said connector being provided with a cover member having strip-shaped extensions, constituting a click-stop position blocking said hook-shaped spring elements, wherein the connector housing has an assembly opening closed by a cover member retained on said housing by a pin arranged in front of said cover member in a push-on direction, and by guide elements, attached to front and rear regions of longitudinal sides of said cover member, said cover member being slidable over said assembly opening of said housing in a direction parallel to an upper surface of said connector, from a preclick-stop position to said click-stop position by means of projections provided on said longitudinal sides.

5,586,903

PLUG CONNECTOR IN WHICH THE CABLES ARE LED OUT AT AN ANGLE AND WITH A RELEASABLE SECONDARY LOCK

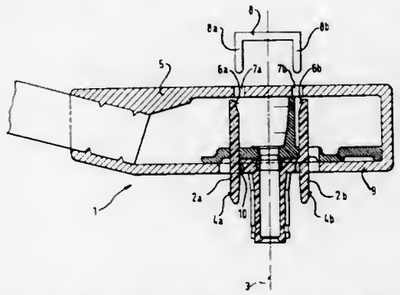
Manfred Hoffmann, Reichenschwand, Germany, assignor to Framatome Connectors International, Paris, France

Filed Apr. 18, 1995, Ser. No. 423,102

Claims priority, application Germany, Apr. 25, 1994, 44 14 348.6

Int. Cl.[6] H01R *13/627;13/62*

U.S. Cl. 439—352 **7 Claims**



1. A plug connector in which cables are led out at an angle and comprising secondary locking means, said plug connector comprising:

(a) a plug part on which at least two opposite tongues are disposed parallel to an axis of said plug part, said tongues comprising outwardly directed catches;

(b) a socket part comprising slots receiving said tongues and shoulders for engagement of said catches;

(c) said tongues extending towards a back wall of said plug part;

(d) said tongues having side surfaces oriented towards said axis and being bevelled away from said axis towards said back wall;

(e) the tongues being adapted to pivot on a housing of said plug part over substantially half a length of said tongues; and

(f) said back wall being formed with slots in a region of said bevelled side surfaces of said tongues in such a manner that a U-shaped yoke, upon insertion of limbs of said yoke into said slots, forces said tongues away from said axis in this zone so that said opposite ends of tongues are moved with said catches towards said axis.

5,586,904

SAFETY STRUCTURE IMPROVEMENT OF A BULB SOCKET

Ming H. Huang, 2, Lane 65, Cheng Kong Road, Hsinchu, Taiwan

Filed Mar. 17, 1995, Ser. No. 404,494

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—419 **1 Claim**

1. A lamp socket assembly for securely and operatively receiving therein a lamp having an electric conduction terminal comprising:

(a) a socket member extending in an axial direction, said socket member having a sidewall portion and a base portion defining a chamber for coaxially receiving at least a portion of said

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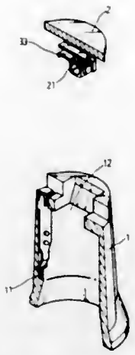


lamp, said base portion having formed therein a through opening, said sidewall portion having formed therein an elongate insertion groove;

(h) a cover member coupled to said base portion of said socket member, said cover member having a supporting seat extending in said axial direction into said opening of said base portion of said socket member, said supporting seat having front and side surfaces extending substantially in said axial direction, said side surface having an elongate slot formed therein, said front surface having a recessed area and a raised block protruding therefrom, said supporting seat having formed thereon a boss portion projecting in said axial direction and a plurality of barb projections, said barb projections engaging said base portion of said socket member to secure said coupling of said cover member therewith;

(c) a first terminal conductor plate received in said insertion groove of said socket member; and,

(d) a second terminal conductor plate coupled to said supporting seat of said cover member, said second terminal conductor plate having a first end, a second end, and an intermediate plate portion extending therebetween, said first end securely engaging said raised block of said cover member supporting seat, said second end having formed thereon a pointed portion received in said elongate slot of said cover member supporting seat, said intermediate plate portion being adapted for resilient deflection by said electric conduction terminal of said lamp into contact with said boss portion of said cover member supporting seat when said lamp is received in said lamp socket assembly.

5,586,905

INSULATION DISPLACEMENT ELECTRICAL CONNECTOR WITH IMPROVED STRAIN RELIEF

Robert C. Marshall, St. Petersburg, and Frank Pansari, Jr., Clearwater, both of Fla., assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 1, 1993, Ser. No. 146,384

Int. Cl.[6] H01R *13/58*

U.S. Cl. 439—463 **9 Claims**

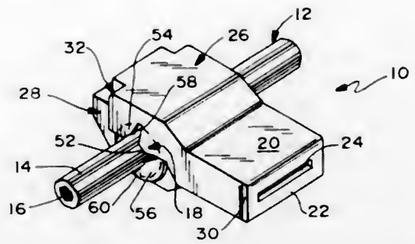
1. In an electrical connector assembly for terminating an insulated electrical wire having an inner conductor surrounded by insulation, the connector assembly including:

housing means having a wire-receiving opening therein for receiving the insulated electrical wire;

a terminal mounted in the housing means and having an insulation displacement slot adapted to displace the insulation of the wire and electrically engage the inner conductor to create an electrical connection therebetween;

wherein the improvement comprises:

integrally molded strain relief means located adjacent the connection within the wire-receiving opening of the housing means for surrounding and gripping the insulated wire substantially entirely thereabout,



wherein the wire-receiving opening extends entirely through the housing means and said integrally molded strain relief means are positioned on both sides of the terminal within the opening adjacent the electrical connection to provide support to the electrical insulated wire in two locations longitudinally spaced along the wire on opposite sides of the terminal,

whereby the strain relief means provide support to the insulated electrical wire and strain relieves the inner conductor.

5,586,906

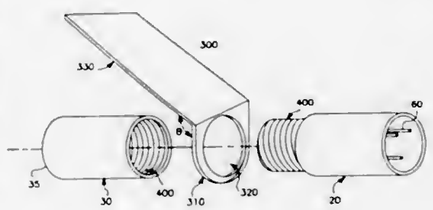
ELECTRICAL CONNECTOR HAVING AN IMPROVED GRIP MEMBER

Theodore Staros, Margate, and Alan Flum, Boca Raton, both of Fla., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Jul. 28, 1994, Ser. No. 282,188

Int. Cl.[6] H01R *13/00*

U.S. Cl. 439—483 **10 Claims**



1. An electrical connector comprising:

a housing comprising:

a front housing which is detachably coupled to a back housing;

a manual grip member removably attached between said front housing and said back housing comprising:

a substantially planar collar member having an opening formed therein for receiving said housing

a substantially planar pull tab having an area which is greater than the area of said planar collar member

said pull tab is attached to said collar member so as to form an angle therebetween which is less than 180 degrees but greater than 90 degrees;

said front housing further comprises

a plurality of electrical contacts each attached to an electrically conductive terminal

an insert assembly for holding said electrical contacts in position within said housing;

said back housing further comprises

an opening for receiving an electrical conductor

a clamping means for physically interfacing an electrical conductor received through said opening to said back housing; and wherein axial force applied to said pull tab is translated to said housing without stressing said contacts.

5,586,907

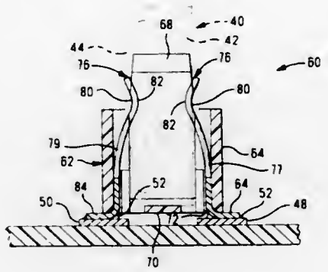
BATTERY CONNECTOR

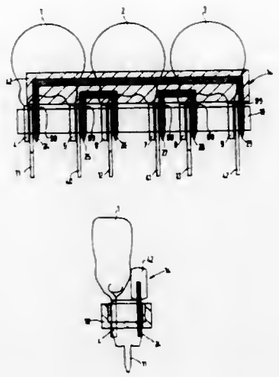
Robert H. Frantz, Newville; John T. Larkin, Jr., New Cumberland, and Robert S. Correll, Jr., Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 25, 1995, Ser. No. 519,216

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—500 **2 Claims**





1. A battery connector for disk-shaped batteries comprising:

a dielectric housing having opposed sidewalls, opposed endwalls and a bottom wall together defining a battery receiving cavity said bottom wall including two terminal receiving passageways extending therethrough one proximate each sidewall

said endwalls of said housing extend outwardly from said housing and beyond said battery receiving cavity to define spring arms at leading ends thereof dimensioned to receive said battery therebetween and retain said battery in said housing cavity,

a surface mountable positive terminal and a surface mountable negative terminal, each having spring arm contact sections electrically engageable with a respective battery electrode, and surface mountable connecting sections, said positive and negative terminals being insertable through respective terminal receiving passageways with said spring arm contact sections opposing each other along said sidewalls of said housing and said surface mountable connecting sections of both said terminals extending outwardly from respective said housing sidewalls at the bottoms thereof;

whereby said positive and said negative terminals are electrically engageable with battery electrodes on opposed surfaces of said battery, and surface mountable connecting sections of said positive and negative terminals are spaced apart at least a sufficient distance from each other to prevent bridging therebetween when said connecting sections are soldered to respective circuit pads on a circuit board.

5,586,908

SAFETY UNIT FOR AN ELECTRIC 3-PHASE CIRCUIT

Henri L. P. Lorrain, Brussels, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1994, Ser. No. 302,140

Claims priority, application Belgium, Sep. 8, 1993, 09300942

Int. Cl.[6] H02H *9/04*

U.S. Cl. 439—511 **7 Claims**

1. A safety unit for an electric 3-phase circuit, said safety unit comprising: three semi-conducting components each provided with a first terminal and a second terminal; a support having three contact pins, each contact pin respectively electrically couplable to a respective first terminal, said support further including a plurality of receptive apertures formed therein; and an insertive module having a plurality of connection pins for selectively electrically interconnecting a respective first terminal and a respective contact pin within said respective receptive apertures.

5,586,909

SEALING STRUCTURE FOR A PANEL-MOUNTED ELECTRICAL CONNECTOR

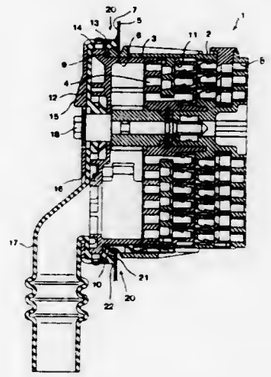
Toshikazu Saba, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 23, 1994, Ser. No. 347,143

Claims priority, application Japan, Nov. 25, 1993, 5-067943 U; Nov. 26, 1993, 5-068073 U

Int. Cl.[6] H01R *13/52;13/74*

U.S. Cl. 439—559 **11 Claims**



1. A sealing structure for a panel-mounted electrical connector comprising:

a panel having a mounting hole therein;

first and second connector housings fitted into said mounting hole formed in said panel from opposite sides of the panel such that said panel is interposed between said first and second connector housings, said second connector housing having a peripheral edge, and said first connector housing having a portion thereof extending through said mounting hole, said portion forming an end face; and

an annular sealing member mounted on said peripheral edge of said second connector housing, said annular sealing member

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comprising a plurality of annular abutting faces abutting one side of said panel and an annular inner seal engaging said end face of said portion of said first connector housing.

5,586,910

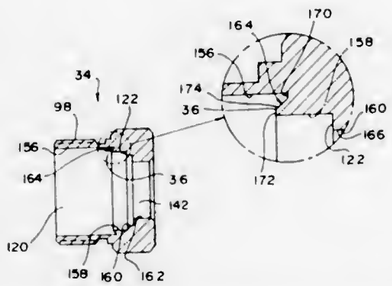
CLAMP NUT RETAINING FEATURE

James Del Negro, Woodbury; Russell Brown, Oakville, and Roger Avery, Danbury, all of Conn., assignors to Amphenol Corporatinn, Wallingford, Conn.

Filed Aug. 11, 1995, Ser. No. 514,227

Int. Cl.[6] H01R *17/04*

U.S. Cl. 439—584 6 Claims



1. A retention assembly for two relatively movable members in an electrical connector, comprising:

a first member having a longitudinal axis, said first member having

a first end portion including a first inner peripheral surface with a first diameter,

a second end portion including a second inner peripheral surface with a second diameter smaller than said first diameter, a third inner peripheral surface having a third diameter smaller than said second diameter,

a first radially extending axially facing interface between said first inner peripheral surface and said second inner peripheral surface, said interface including a protrusion extending axially therefrom, and

a second radially extending axially facing interface between said second inner peripheral surface and said third inner peripheral surface; and

a second member having a longitudinal axis adapted to fit within said first member, said second member including

a first end,

a second end,

a tapered inner peripheral surface and a first outer peripheral surface at said first end with a fourth diameter adapted to cooperate with said first inner peripheral surface;

a second outer peripheral surface at said second end with a fifth diameter adapted to cooperate with said second inner peripheral surface,

a third outer peripheral surface located between said first and second outer peripheral surfaces with a sixth diameter smaller than said fourth and fifth diameters, said third outer peripheral surface forming the bottom of a slot located in the second member between said first and second outer peripheral surfaces, said slot adapted to receive said protrusion after it is radially deformed by axial pressure, said protrusion and said slot adapted to cooperate such that the second member may move axially within said first member.

5,586,911

SHIELDING DATA CONNECTOR

Mitchell E. Miller, Clemmons; Julian J. Ferry, Kernersville, both of N.C.; Brian E. Kilbey, Chesham, England; Bruce S. Coolbear, East Barnet, England, and Richard F. Gandy, St. Albans, England, assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 101,529, Aug. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 941,526, Sep. 8, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,099

Claims priority, application United Kingdom, Nov. 3, 1992, 9222960; Dec. 29, 1992, 9227064; Feb. 22, 1993, 9303502

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—607 3 Claims

1. An electrical connector for data transfer, comprising:

an insulative terminal support housing having a terminal support platform, defining a mating face and a wire connecting face and an open upper face;

a plurality of terminals positioned laterally along the terminal support platform, with a contact section disposed adjacent the mating face, and a wire connecting section adjacent the wire connecting face;

a wire stuffer cap, positionable over the wire connecting sections of the terminals, and having wire positioning grooves for initial retention of the wires to be terminated, the wire stuffer cap enclosing said wire connecting sections along a length thereof, said wire stuffer cap further comprising a slot extending along a length of said cap, and extending between at least two said terminals; an

shielding members comprised of a lower shield and an upper shield, said upper shield including an integral cross talk shield which is profiled for receipt within said slot, to provide a cross talk shield between the wire connecting sections of said at least two terminals.

5,586,912

HIGH DENSITY FILTERED CONNECTOR

Robert A. Eslampour, Norwalk; Robert J. Shiley, II, Monroe, and Allan W. Hendry, Norwalk, all of Conn., assignors to Burndy Corporation, Norwalk, Conn.

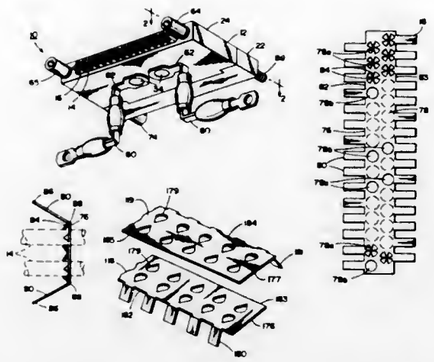
Continuation of Ser. No. 973,827, Nov. 9, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 411,397

Int. Cl.[6] H01R *13/66*

U.S. Cl. 439—620 31 Claims

1. A filtered electrical connector comprising:

an electrically conductive housing;



a plurality of filtered contacts located, at least partially, in the housing, the filtered contacts each including a ceramic tubular capacitor; and

at least one ground plane member having a center section and legs extending outwardly from the center section, the center section having receiving areas with each of the capacitors being located in one of the receiving areas and making electrical contact thereat, all of the receiving areas, at least along one side of the center section, each having a separate one of the legs proximate thereto, each leg having a bend proximate the center section and an end that contacts the housing.

5,586,913

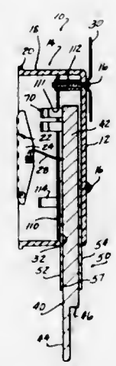
S TO B WATTHOUR METER SOCKET ADAPTER

Darrell Robinson, Highland Township; Karl Loehr, Novi; Allen V. Pruehs, Howell, and Robert O. Learmont, Walled Lake, all of Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 334,562, Nov. 4, 1994, which is a continuation-in-part of Ser. No. 215,915, Mar. 22, 1994, abandoned, and Ser. No. 216,261, Mar. 22, 1994, abandoned. This application Jan. 11, 1995, Ser. No. 371,015

Int. Cl.[6] H01R *25/00*

U.S. Cl. 439—638 32 Claims



1. A watthour meter socket adapter for mounting a watthour meter having a plurality of outwardly extending blade terminals in a watthour meter socket including a plurality of terminals connected to electrical power line and load conductors, the watthour meter socket adapter comprising:

a housing having a base and an annular sidewall extending from the base and terminating in a watthour meter mounting flange;

a plurality of rigid electrical conductors disposed within the housing, each electrical conductor having first and second ends;

an electrical contact mounted on the first end of each electrical conductor for receiving one blade terminal of a watthour meter therein, each electrical contact including:

first and second spaced contact clips disposed in registry with each electrical conductor;

biasing means, engageable with each of the first and second contact clips, for biasing an end of each of the first and second contact clips toward each other; and

means for fixedly joining the first and second contact clips and the biasing means to the electrical conductors;

an aperture formed in the sidewall; and

a portion of each electrical conductor and the second end of each electrical conductor extending through the aperture externally from the housing for electrical connection of the second end of each electrical conductor to one terminal in a watthour meter socket.

5,586,914

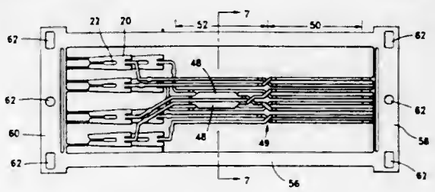
ELECTRICAL CONNECTOR AND AN ASSOCIATED METHOD FOR COMPENSATING FOR CROSSTALK BETWEEN A PLURALITY OF CONDUCTORS

George H. Foster, Jr., deceased, late of Winston-Salem, N.C., and Donald L. Metzger, Harrisburg, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed May 19, 1995, Ser. No. 444,501

Int. Cl.[6] H01R *23/02;4/24*

U.S. Cl. 439—676 23 Claims



1. An electrical connector comprising:

a housing defining a cavity which opens through a front surface of said housing, said housing comprising a rear surface, opposite the front surface, defining a plurality of apertures extending therethrough; and

a plurality of elongate conductors positioned at least partially within the cavity defined within said housing, each of said conductors having a resilient contact portion at a first end and an insulation displacement contact portion at a second end, opposite the first end, extending through an aperture defined in the rear surface of said housing, each of said conductors having a respective substantially constant width, wherein said plurality of conductors include first and second elongate conductors which extend in a substantially parallel, laterally spaced relationship from their respective first ends to a predetermined crossover location where the first and second conductors laterally cross without establishing electrical contact therebetween, and wherein each conductor of a laterally spaced-apart pair of said conductors has a respective portion which is wider than its said substantially constant width, and said wider portions are positioned in an overlapping, vertically spaced relationship at a predetermined location spaced apart from the crossover location to compensate for crosstalk between said plurality of conductors.

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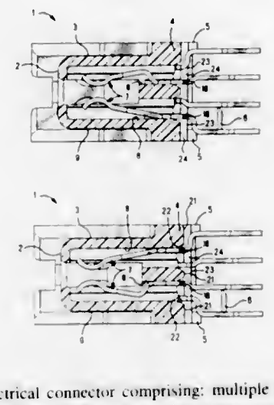
5,586,915
ELECTRICAL CONNECTOR WITH CONTACTS AT DIFFERENT INSERTION DEPTHS

Ronald J. Baker, York; Douglas G. Fisher, Boiling Springs; Martha L. Rupert, Hummelstown, and David M. Swartz, York, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 20, 1994, Ser. No. 359,497
Int. Cl.[6] H01R *23/70*
U.S. Cl. 439—733.1 **7 Claims**

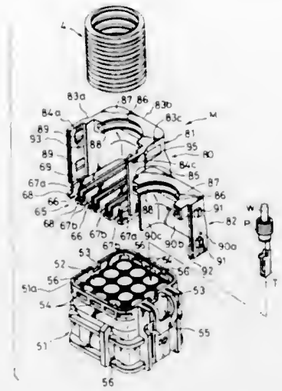


1. An electrical connector comprising: multiple electrical contacts extending axially along respective contact receiving cavities in an insulating housing upon insertion of said contacts thereinto from an insertion face toward a mating end of the housing, wherein at least two transverse marker surfaces on the housing are positioned at different depths along an axis of the housing and exposed to said insertion face to be engageable by insertion tooling to limit travel thereof during contact insertion, and wherein each of said electrical contacts is provided with at least one respective tool-engageable transverse marker surface that is, upon contact insertion, in coplanar nonabutting relationship with respect to selected one of the housing marker surfaces depending upon the desired depth of insertion of the contact into the housing.

5,586,916
WATERPROOF COVER FOR CONNECTOR

Yasuhisa Shinji; Kazuhiro Morishita, and Hiraji Takase, all of Shizunka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 415,986
Claims priority, application Japan, Apr. 15, 1994, 6-077257
Int. Cl.[6] H01R *13/514;13/56;13/58*
U.S. Cl. 439—752 **9 Claims**



1. A waterproof cover for a connector, which comprises:

a rear holder portion attached to a rear portion of a connector housing and holding terminals to be inserted into terminal insertion holes of the connector housing from a rear side of the connector housing; and

a waterproof cover portion attached to a rear side of said rear holder portion and covering wires extending rearwardly from the terminals, said waterproof cover portion having:

a pair of first and second cover halves, a front end surface of said first cover half being formed integrally with an outer circumference of said rear holder portion so as to form an end surface plate of said first cover half along substantially the entire circumference of said first cover half;

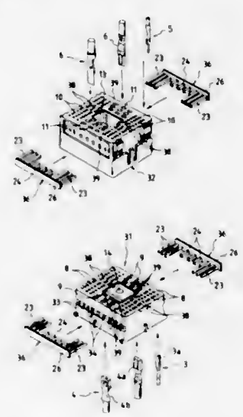
a hinge integrally connected to each of said first and second cover halves and linking said first and second cover halves so as to be opened and closed relative to each other; and

a lock mechanism locking a pair of said first and second cover halves when said two cover halves are closed.

5,586,917
CONNECTOR HAVING AN ASCERTAINMENT HOLE FOR VISUALLY CHECKING ENGAGEMENT

Sakai Yagi; Tamio Watanabe, and Toru Nagano, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 405,855
Claims priority, application Japan, Mar. 17, 1994, 6-047156
Int. Cl.[6] H01R *13/514*
U.S. Cl. 439—752 **4 Claims**



1. A double engagement connector, comprising:

a connector housing comprising a plurality of longitudinally and laterally arranged terminal accommodation chambers and first engagement means for engaging a plurality of terminals inside the terminal accommodation chambers; and

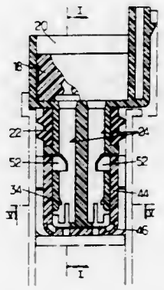
a second insertion engagement means for engaging the terminals when the second insertion engagement means is inserted into the connector housing, wherein

said connector housing comprises at least one engagement pin insertion hole provided on an outer peripheral surface of said connector housing for communicating said plurality of terminal accommodation chambers aligned in a row, said second insertion engagement means comprising at least one engagement pin for engaging the terminals in the terminal accommodation chambers when the at least one engagement pin is inserted in the at least one engagement pin insertion hole, said second insertion engagement means also comprising a connecting section for connecting base end portions of the at least one engagement pin at intervals corresponding to an arrangement of the at least one engagement pin insertion hole, and said connector housing comprising at least one ascertainment hole penetrating through a position where an end of the at least one engagement pin inserted in the at least one engagement pin insertion hole is disposed so that the end of the at least one engagement pin can be visually observed through the at least one ascertainment hole.

5,586,918
CONNECTOR HAVING A GRID FOR SECONDARY LOCKING OF TERMINALS

Gilles Chemin, Toulouse, France, assignor to Framatome Connectors International, Paris, France

Filed Dec. 19, 1995, Ser. No. 574,965
Claims priority, application France, Dec. 19, 1994, 94 15245
Int. Cl.[6] H01R *13/514*
U.S. Cl. 439—752 **5 Claims**



1. A connector designed to be coupled to a complementary connector by plugging, comprising:

an insulating body of rectangular cross-section formed with at least one row of passages extending parallel to a plugging direction, each said passage being formed with a backwardly directed shoulder, at least one side wall of each of said passages being cut out to form a detent whose resilience tends to hold a catch in a position in which it projects into the respective passage;

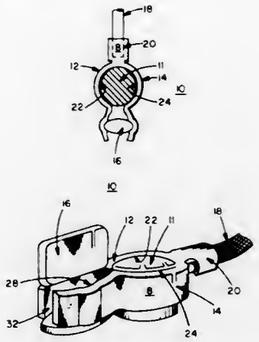
a plurality of contact terminals received in said passages and each sized to be retained by the respective catch against the respective shoulder; and

a unitary locking grid dimensioned to be fitted against a front end face of said body, having an end wall designed to contact the front end face and formed with holes in registry with the passages, two side flanks that are spaced apart so as to straddle two walls of the body which are orthogonal to the row, and two side flaps that are connected to the end wall by flexible portions, and that are designed to contact outside walls of the body which are parallel to the row, each said side flap having a plurality of end internal extensions for penetrating through windows in said insulating body to retain the grid and lock the terminals of said row, said flaps being shaped to prevent the catches from moving away from a position in which they project into the passages.

5,586,919
BATTERY CONNECTOR

John D. Ritson, 12 Northwoods Rd., Granby, Conn. 06060

Filed Apr. 3, 1995, Ser. No. 414,419
Int. Cl.[6] H01R *4/38*
U.S. Cl. 439—757 **9 Claims**



1. A releasable connector for electrically connecting a cable to a generally cylindric battery post comprising:

a body portion adapted for substantially surrounding and clamping the connector to a generally cylindric battery post;

a cable attachment portion connected to said body portion for conducting electricity between said body portion and a cable;

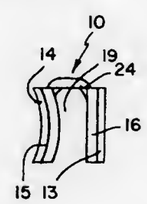
the structure of said body portion being comprised solely of a strip of sheet metal configured to create opposed partially cylindrical section shapes normally inwardly biassed in compression towards one another for clamping about a substantially cylindric battery post; and

means associated with each of said partially cylindrical section shapes for moving the normally inwardly biassed partially cylindrical section shapes apart from one another from an otherwise compressing condition about a battery post.

5,586,920
BLADE RECEPTACLE

Donald C. Brown, Freehold, N.J., assignor to Heyco Stamped Products, Inc., Toms River, N.J.

Filed Feb. 17, 1995, Ser. No. 389,946
Int. Cl.[6] H01R *11/22*
U.S. Cl. 439—857 **8 Claims**



1. A three sided stamped metal female blade receptacle for a molded plastic plug said receptacle including a longitudinal opening for engaging a variety of male blade variants within its length and providing full line side contact on one side and full surface contact on another side to an engaged blade, said receptacle comprising a crimp end and a blade receiving portion, said crimp end including a pair of crimp arms, said blade receiving portion including a flat side; a curved side; and a back portion, said flat side and curved side extending longitudinally and substantially on a perpendicular plane from said back portion and substantially the length of said blade receiving portion, said curve of said curved

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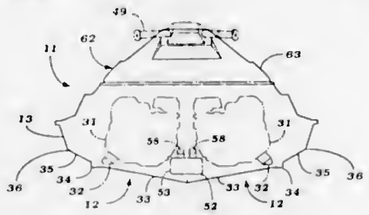
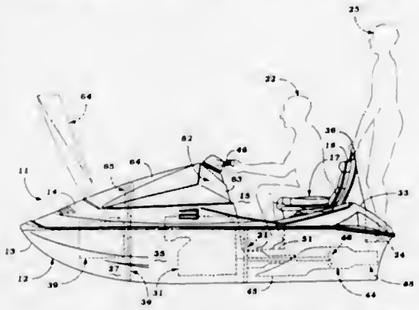
side longitudinal and convex within said blade receiving portion; and resilient and spring biased, said sides each having longitudinal edges, said longitudinal edges straight and substantially parallel to each other and substantially the same height.

5,586,921
WATERCRAFT
Noboru Kobayashi; Tomoyoshi Koyanagi, and Keijiro Ikeda, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Division of Ser. No. 997,599, Dec. 28, 1992, Pat. No. 5,449,305. This application May 22, 1995, Ser. No. 446,282
Claims priority, application Japan, Dec. 28, 1991, 3-359432
Int. Cl.[6] B63H *11/00*
U.S. Cl. 440—38 **21 Claims**



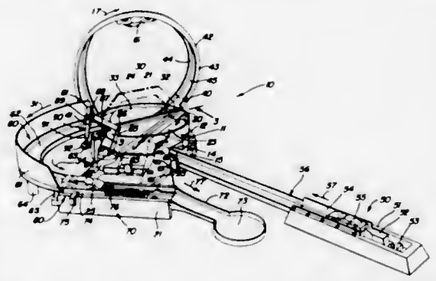
1. A small watercraft comprising a hull having a pair of chines which connect side surfaces of the hull with a hull bottom surface, said hull bottom surface including at least first and second stripes with said first stripe being disposed between one of said chines and a center of said hull and the second stripe being disposed between the other chine and the center of said hull, and a pair of propulsion devices supported within the hull in an area disposed between said first and second stripes,said propulsion devices include intake ports disposed between said first and second stripes, and the distance between said first stripe and the closest of said intake ports is greater than a distance between said first stripe and the closest chine.

5,586,922
WATERCRAFT
Noboru Kobayashi; Tomoyoshi Knyanagi, and Keijiro Ikeda, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Division of Ser. No. 997,599, Dec. 28, 1992, Pat. No. 5,449,305. This application Feb. 27, 1995, Ser. No. 394,458
Claims priority, application Japan, Dec. 28, 1991, 3-359432
Int. Cl.[6] B63H *21/00*
U.S. Cl. 440—88 **16 Claims**



1. A small watercraft having a hull, a pair of engines disposed in side by side relationship in said hull, each of said engines having an exhaust pipe, a single waterlock disposed device comprised of a unitary outer housing within said hull along the longitudinal enter line of said watercraft and positioned at one end of said engines, said waterlock device having a pair of exhaust gas inlets each for receiving the exhaust gases a from a respective of said exhaust pipes and at least one discharge for discharging the exhaust gases to the atmosphere, said waterlock device unitary outer housing being provided within an internal trap for precluding the entry of water into said exhaust pipes from said waterlock device.

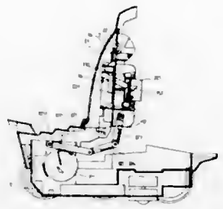
5,586,923
TOY VEHICLE PLAYSET FOR THERMOCHROMIC VEHICLES
Keith A. Hippely, Manhattan Beach; Larry R. Wood, Redondo Beach; Brian E. Walsh, Mission Hills, and Terence A. Choy, Lawndale, all of Calif., assignors to Mattel, Inc., El Segundo, Calif.
Filed Feb. 9, 1995, Ser. No. 388,224
Int. Cl.[6] A63H *33/00;3/00;3/52;18/00*
U.S. Cl. 446—14 **13 Claims**



1. For use in combination with a toy vehicle having at least a portion thereof bearing a thermochromic material, a toy vehicle playset comprising:
a trackway for guiding a toy vehicle along a travel path having an entrance gate and an exit gate.;
a tank unit having at least two tank portions each having a ramp passing therethrough; and
a base supporting said tank unit between said entrance gate and said exit gate having means for aligning a selected one of said ramps within a selected one of said at least two tank portions within said travel path,
said at least two tank portions each receiving quantities of different temperature liquid such that said toy vehicle traversing said selected one of said ramps is exposed to the liquid within said selected one of said at least two tank portions.

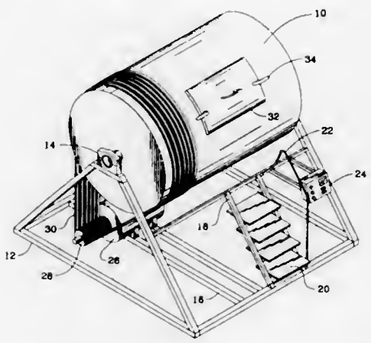
5,586,924
TOY CAR STRUCTURE
Tien F. Huang, Taipei, Taiwan, assignor to Wen Ho Tsai, Taipei, Taiwan
Filed Jan. 25, 1996, Ser. No. 591,811
Int. Cl.[6] A63H *29/22*
U.S. Cl. 446—462 **7 Claims**

1. A toy car structure comprising:
a fixed casing including a chassis and a fixed outer housing secured thereon, a power wheel assembly being disposed under a bottom side of the chassis and multiple decorative wheels being disposed on lateral sides thereof, a hook portion being disposed at one end of the fixed outer housing;
a movable casing including a movable outer housing and an inner decorative housing secured therein, the end of the outer housing being pivotally connected with the top of the fixed outer housing by a pivot shaft, a movable door held by a



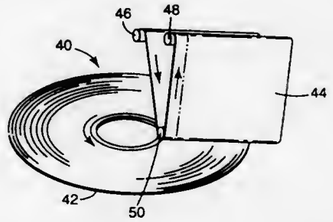
restoring spring being disposed on an outer side of the inner decorative housing and outwardly pivotable for showing the inner decorative housing; and
a driving mechanism including a power source fixed in the fixed casing to output power through two driving wheels and a movable rotary shaft, each driving wheel being disposed with an outer flange and inner flange, the outer flange driving a linkage assembly connected to the end of the inner decorative housing to push the movable casing open the middle portion of the movable rotary shaft being supported on the chassis and one end thereof being intermittently pressed by the inner flange of the driving wheel so as to change the engagement between the movable rotary shaft and the power wheel assembly for intermittent rotation and running.

5,586,925
APPARATUS AND METHOD FOR PROCESSING MARBLE
Anthony DiNorcia, Sr.; Anthony DiNorcia, Jr., and Donato L. DiNorcia, all of 702 7th Ave., Lake Worth, Fla. 33463, assignors to Donato DiNorcia; Anthony DiNorcia, Jr., and Anthony DiNorcia, Sr., all of Lake Worth, Fla.
Filed Apr. 8, 1994, Ser. No. 225,379
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—35 **11 Claims**



1. A method for surface treating marble to produce a weathered appearance comprising the steps of:
(a) selecting a group of marble materials having similar hardness;
(b) depositing said marble materials in a drum having an interior stone lined surface;
(c) placing silica sand into said drum;
(d) adding water into said drum;
(e) adding clay to said drum;
(f) rotating said drum for a predetermined period of time dependant upon the hardness of said marble materials;
(g) removing said marble materials from said drum; and
(h) slicing said marble materials along a longitudinal length thereof to provide two separate marble pieces with weathered veneer surfaces and flat mounting surfaces.

5,586,926
METHOD FOR TEXTURING A METALLIC THIN FILM
Eric D. Wedell, White Bear Lake, and Darlene N. Strecker, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 6, 1994, Ser. No. 301,254
The portion of the term of this patent subsequent to Aug. 31, 2012, has been disclaimed.
Int. Cl.[6] B24B *29/00*
U.S. Cl. 451—59 **19 Claims**



1. A method for texturing a surface of a metallic thin film of a magnetic disk substrate comprising the steps of:
(a) frictionally contacting said surface of said metallic thin film with an abrasive article, wherein the abrasive article comprises an abrasive coating including a water-soluble binder material and abrasive particles, wherein said abrasive coating is adhesively attached to a flexible foraminous fibrous backing; and
(b) abrading said surface of said metallic thin film by moving said metallic thin film and said abrasive article relative to one another with said abrasive coating being in contact with an aqueous liquid solution to form scratches in said surface of said metallic thin film, wherein said liquid solution is free of abrasive particles before said contact with said abrasive coating.

5,586,927
CONSTANT CONCENTRATION RINSEABLE SLURRY DEVICE
William G. Herbert, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 30, 1994, Ser. No. 351,100
Int. Cl.[6] B24C *9/00*
U.S. Cl. 451—88 **9 Claims**

6. A honing system for a substrate comprising:
a slurry containment tank for retaining a slurry of a liquid and a solid, including an opening and a bottom, containing an amount of the slurry;
an independent source of the liquid;
means for mounting and moving the substrate;

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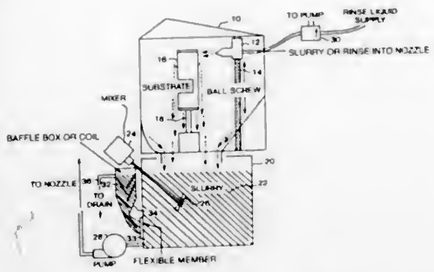


means for forcibly conducting the slurry against the substrate, the slurry conducting means connected to the slurry containment tank to receive the slurry;

means for forcibly conducting the liquid against the substrate, the liquid conducting means connected to the independent source of the liquid to receive the liquid;

a containment booth, connected to the opening of the slurry containment tank, enclosing the slurry conducting means, the liquid conducting means, and the substrate;

means for mixing the slurry in the slurry containment tank;

a drain;

means for separating the liquid from the slurry contained in the slurry containment tank wherein the separation means has an upper end and a lower end, the lower end is submerged in the slurry contained in the slurry containment tank, the upper end is secured at a predetermined vertical level relative to the vertical level of the bottom of the slurry containment tank, and the upper end is connected to the drain,

wherein the separation means is submerged in the slurry contained in the slurry containment tank up to the level of the upper end; and

wherein the mixing of the slurry by the mixing means causes the separation means to vibrate.

5,586,928

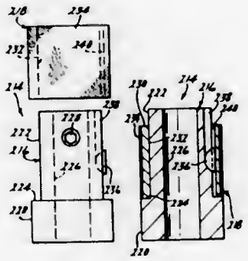
GRINDING APPARATUS WITH TOUCH-TOP WORK SURFACE

Richard K. Wland, Birmingham, and Dennis R. Buschmohle, St. Clair Shores, both of Mich., assignors to Inland Craft Products Co., Madison Heights, Mich.

Continuation-in-part of Ser. No. 271,135, Jul. 6, 1994, Pat. No. 5,549,509. This application Dec. 4, 1994, Ser. No. 353,086

Int. Cl.[6] B24B *7/00*

U.S. Cl. 451—177 **16 Claims**



16. A grinding wheel assembly to be secured to a drive shaft of an electric motor associated with a grinding apparatus, said grinding wheel rotating upon rotation of the drive shaft, said grinding wheel assembly comprising:

a core element including a first cylindrical portion of one diameter and a second cylindrical portion of another diameter, said one diameter of the first cylindrical portion being greater than the another diameter of the second portion so as to define a shoulder therebetween, said first cylindrical portion including an internal bore for accepting the drive shaft in a friction type engagement, said first cylindrical portion further including a set screw positioned within an opening in the first cylindrical portion that allows the core element to be secured to the drive shaft, said second cylindrical portion including an external threaded portion; and

a cylindrical grinding element including an internal bore having an internal threaded portion, said grinding element further including an outer layer of an abrasive grit, wherein the grinding element is threadably engageable with the second cylindrical portion of the core element to be in contact with the shoulder.

5,586,929

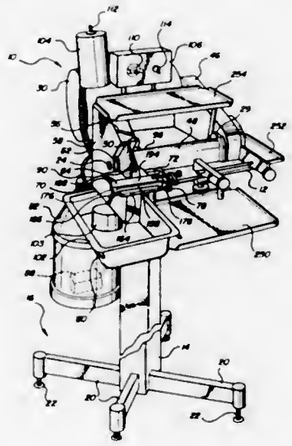
PRECISION CUT OFF MACHINE

Hayden L. Butcher, and Karen N. Butcher, both of 21699 Swan Creek Rd., Merrill, Mich. 48637

Filed Nov. 23, 1994, Ser. No. 344,508

Int. Cl.[6] B24B *3/00*

U.S. Cl. 451—213 **20 Claims**



1. A precision cut-off machine for cutting workpieces made from hard materials comprising a frame, a spindle rotatably journaled on the frame for rotation about a spindle axis of rotation, a motor supported by the frame and spaced from the spindle, a torque transmission drive connecting the motor to the spindle that is operable to rotate the spindle, a flexible abrasive cutting disk secured to the spindle and rotatable with the spindle, a fixed workpiece support pivotally attached to the frame adjacent to the flexible cutting disk for pivotal movement about an axis parallel to the spindle axis that is operable to support a workpiece while the workpiece is manually held and advanced to the flexible cutting disk, a slot in the fixed workpiece support perpendicular to the spindle that receives a portion of the flexible cutting disk, and a coolant wand adjustable supported on the frame adjacent to the flexible cutting disk, and a coolant pump connected to the coolant wand and operable to supply coolant to the workpiece while the workpiece is supported by the fixed workpiece support and manually advanced toward and cut by the flexible cutting disk.

5,586,930

GRINDING CHIP FITTING TYPE GRINDING PLATE

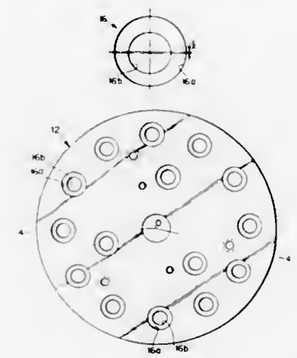
Teruoki Hayashi, and Yoshio Shibai, both of Kyoto, Japan, assignors to Sanwa Kenma Kogyo Co., Ltd., Kyoto, Japan

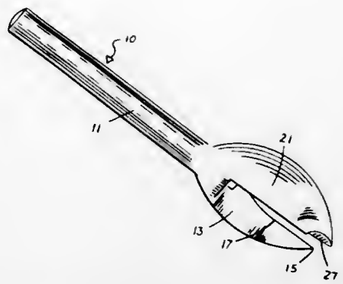
Filed Dec. 8, 1995, Ser. No. 569,985

Claims priority, application Japan, Mar. 15, 1995, 7-056277

Int. Cl.[6] B23F *21/03*

U.S. Cl. 451—548 **11 Claims**





1. A grinding chip fitting type grinding plate comprising a plurality of grinding chips each having a cylindrical mounting portion, a grinding chip mounting plate to which the grinding chips are attached, and a holding plate, wherein

each of said grinding chips is provided with an O-ring attached to the cylindrical mounting portion having a front end to which a diamond chip is bonded, and a projection portion is integrally formed at a rear end of the mounting portion;

said grinding chip mounting plate has a plurality of grinding chip receiving holes which are radially provided, and each of the receiving holes is a stepped hole composed of a mounting portion receiving hole and a projection receiving hole which is radially offset with respect to the mounting portion receiving hole by a predetermined eccentric amount; and

said holding plate has a plurality of holes through each of which the diamond chip passes,

wherein the mounting portion of each of said grinding chips is inserted into the mounting portion receiving hole of said grinding chip mounting plate against the resistance of the O-ring, the projection is rotated so that said grinding chip is fixed to said grinding chip mounting plate, and said holding plate is coupled with said grinding chip mounting plate by attaching said holding plate from the side where the diamond chip exists.

5,586,931

HAND OPERATED CRAB LEG OPENER WITH MULTIANGLED BLADE

Richard M. Williams, Jr., 1719 E. Marks St., Orlando, Fla. 32803

Continuation-in-part of Ser. No. 287,299, Aug. 8, 1994, abandoned. This application Aug. 25, 1995, Ser. No. 519,660

Int. Cl.[6] A22C *29/02*

U.S. Cl. 452—6 **25 Claims**

1. A hand held utensil adapted to open elongate sections of crab leg shells and similar objects, said utensil comprising:

a) a manually engagable handle,

b) a planar blade secured to said handle and extending outwardly therefrom to form a somewhat rounded tip, with the forward portion of said blade adjacent said tip being substantially straight.

c) a blade-protecting member secured in a spaced relationship adjacent said substantially straight forward portion of said blade, with said blade-protecting member extending from said handle for a distance exceeding the length of said blade,

d) an open-ended slot defined between said substantially straight forward portion of said blade and said blade-protecting member,

e) said slot being adapted to receive the shell of a crustacean, such that said blade can cut through the shell as user grasping said handle moves said blade longitudinally along the shell,

f) said blade being multiangled, with a rear portion of said blade extending upwardly from said substantially straight forward blade portion in the direction of the adjacent undersurface of said blade-protecting member, said undersurface having a recess therein into part of which said upwardly extending rear portion of said blade extends, thus to provide assured shell-cutting capability when said blade and recess are brought into contact with the shell of a crustacean.

5,586,932

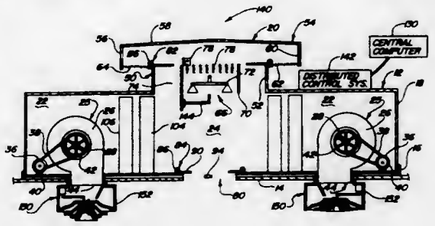
ENVIRONMENTAL CONTROL AIRHOUSE WITH VARIABLE OUTPUT

Thomas E. Kiser, Fremont, Ohio, assignor to Professional Supply, Inc., Fremont, Ohio

Continuation-in-part of Ser. No. 148,833, Nov. 5, 1993, Pat. No. 5,376,045. This application Dec. 22, 1994, Ser. No. 362,128

Int. Cl.[6] F24F *7/08*

U.S. Cl. 454—229 **20 Claims**



1. An airhouse for supplying conditioned air in controlled amounts to the interior of a building, comprising:

an enclosure defining a central chamber,

outside air inlet means for allowing air from outside said interior to enter said enclosure central chamber,

a direct fire burner for combusting a hydrocarbon fuel receiving air from said outside air inlet means and supplying said air from said outside air inlet means to said central chamber,

outside air inlet damper means for adjustably controlling the inlet flow area through said outside air inlet means into said central chamber,

return air inlet means for allowing air within said building interior to enter said enclosure central chamber,

return air inlet damper means for adjustably controlling the inlet flow area through said return air inlet means into said central chamber,

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blower means mounted to said enclosure having an inlet communicating with said enclosure central chamber and an outlet for discharging air into said building interior,

blower speed control means for adjustably controlling the volumetric output rate of said blower means, and

damper control means for controlling said outside air inlet damper means and said return air inlet damper means whereby the total airflow area defined by said outside air inlet damper means and said return air inlet damper means provides airflow velocity through said direct fire burner within a range determined to produce proper combustion through a range of settings of said volumetric output rates of said blower means.

5,586,933

HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

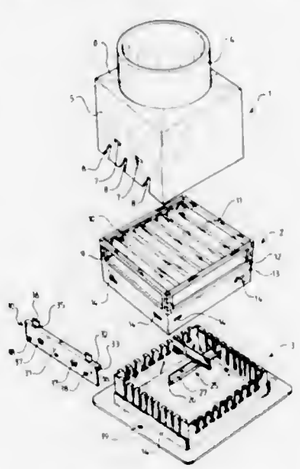
Colin Sawyer, Barming; John Wallis, Warrington, and Peter Bartingale, Margate, all of England, assignors to Hunter Technical Developments Limited, Jersey, Channel Islands

Filed Nov. 2, 1994, Ser. No. 333,557

Claims priority, application United Kingdom, Nov. 2, 1993, 9322559

Int. Cl.[6] F24F *13/075*

U.S. Cl. 454—299 **14 Claims**



1. A grille for use adjacent an outlet of a heating, ventilating or air conditioning system, the grille comprising a frame and a plurality of blades extending between opposed frame parts, each blade having a spindle which is rotatably supported within opposed slots formed in the opposed parts of the frame, the slots having an open end to permit the insertion of a blade spindle therein and a closed end, the spindle being supported at the closed ends of the slots, the grille further comprising means for retaining the blade spindle in the slots, the retaining means comprising a separate retaining element configured as a substantially planar component mountable on the frame of the grille, the frame defining a channel between two substantially parallel walls and the retaining element being configured to be slidingly inserted into the channel upon the frame such that part of the retaining element is located between the two substantially parallel walls and engages the blade spindle when mounted upon the frame and prevents the spindle from moving out of the open ends of the slots.

5,586,934

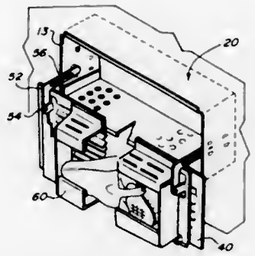
WALL SAFE

Larry A. Dombrowski, 4281 Cherry Hill Dr., Orchard, Mich. 48323; Daniel S. Goldsmith, 1883 Chipping Way, Bloomfield Hills, Mich. 48302; Judith Goldsmith, 1883 Chipping Way, Bloomfield Hills, Mich. 48302, and Walter J. Goldsmith, 1867 Golf Ridge, Bloomfield Hills, Mich. 48302

Continuation-in-part of Ser. No. 375,299, Jan. 20, 1995. This application Aug. 15, 1995, Ser. No. 515,141

Int. Cl.[6] F24F *13/06*

U.S. Cl. 454—309 **8 Claims**



1. For use in conjunction with a wall having an air duct and an opening in the wall which connects a room with the air duct, a safe comprising

a housing having a bottom wall and a pair of spaced side walls which together define an interior, said housing dimensioned to fit within the air duct so that said housing is recessed in said wall and in alignment with the wall opening and so that said bottom wall extends transversely across and covers the air duct,

a grille dimensioned to overlie and cover the wall opening,

means for pivotally mounting said grille to said housing so that said grille is movable between a closed position in which said grille overlies and covers the wall opening and an open position in which said housing interior is accessible from the room, and

air passage means formed through one of said walls of said housing for enabling air flow through one of said walls of said housing, said grille and the air duct,

wherein said bottom wall of said housing forms a support shelf for items placed in said housing interior.

5,586,935

AIR-DIRECTION ADJUSTING APPARATUS FOR AIR-CONDITIONING EQUIPMENT

Satoru Kotoh, Hyogo; Kiyoshi Sakuma, Shizuoka; Takayuki Yoshida, Shizuoka; Hiromi Sano, Shizuoka; Katuyuki Anki, Shizuoka; Shin'ichi Suzuki, Shizuoka; Hideaki Koizumi, Shizuoka; Kaoru Yamamoto, Shizuoka; Kunio Matsushita, Shizuoka; Kenichi Unno, Shizuoka, and Tomoko Oguma, Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 202,258, Feb. 25, 1994. This application Jun. 7, 1995, Ser. No. 478,879

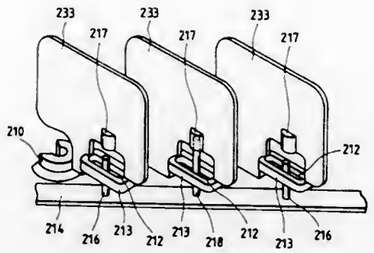
Claims priority, application Japan, Mar. 5, 1993, 5-045142; Aug. 24, 1993, 5-209419

Int. Cl.[6] B60H *1/34*

U.S. Cl. 454—320 **3 Claims**

3. A mechanism for controlling the flow of air from an air-conditioning unit, comprising:

two series of guide vanes respectively located adjacent to one another in the center portion of an air outlet of said air-conditioning unit, said two series of guide vanes having a narrow space therebetween, each of said series of guide vanes engaging in rotational movement in opposite directions to thereby adjust a direction of said flow of air, each of said



guide vanes having a series of cavities formed on a surface thereof for receiving dew.

5,586,936

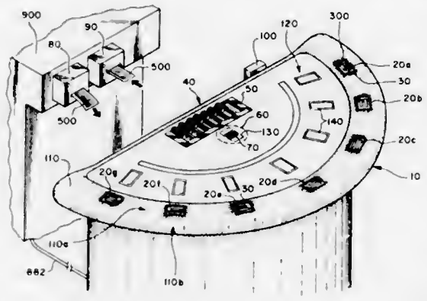
AUTOMATED GAMING TABLE TRACKING SYSTEM AND METHOD THEREFOR

Michael J. Bennett, Las Vegas; John E. Nino, and Brian D. Todoroff, both of Henderson, all of Nev., assignors to Mikohn Gaming Corporation, Las Vegas, Nev.

Filed Sep. 22, 1994, Ser. No. 310,718

Int. Cl.[6] A63F *1/18*

U.S. Cl. 463—25 **19 Claims**



1. An automated gaming table tracking system for a gaming table on which is played a plurality of games for a predetermined type of game, said gaming table including a playing surface, a plurality of player positions, and an operator position, said playing surface having playing areas for the operator and for each of the plurality of player positions, said automated gaming table tracking system comprising:

a sensor located in the playing area of the operator position for sensing when a game is played;

a plurality of player identity cards, each of said player identity cards containing identity information on the player assigned to said player identity card;

a plurality of player station controls, one of said plurality of player station controls located at each of said plurality of player positions, each of said player station controls including:

(a) means for identifying the player position corresponding to the player station control,

(b) means for reading said player identity information from said player identity card when the said player identity card is inserted in said reading means,

(c) means for displaying a plurality of predetermined messages,

(d) means for signaling an indication when said player identity card is inserted in said reading means,

(e) means connected to the identifying means, the reading means, the displaying means, and the signaling means for processing the player position, the player identity information, the plurality of predetermined messages, and the indication, and

(f) means connected to the processing means for providing external communication to and from said player station control,

a central distribution control connected to the external communication providing means of each of said plurality of player station controls, said central distribution control including:

(a) means for identifying the gaming table,

(b) first means connected to the sensor for receiving a game-being-played signal,

(c) second means connected to the external communication providing means for receiving from each of said plurality of player station controls for at least receiving the player position and the player information for each player control station reading an inserted player identity card, and

(d) means connected to the gaming table identifying means and the first and second receiving means for determining the start and end of each of the games and the beginning and termination of play by each player at each player position;

a host computer connected to said central distribution control for storing the player identity information and the player position for each player station control, the start and end of each of the games, and the beginning and termination of play at each player position;

means connected to said host computer for printing a player tracking card for each player having a player identity card inserted into a player station control, including:

(a) the player identity information,

(b) blanks for in-session gaming information; and

means connected to said host computer for reading each said player tracking card when each said player tracking card has the blank in-session gaming information filled in, said host computer storing said read in-session gaming information corresponding to the player identity information.

5,586,937

INTERACTIVE, COMPUTERISED GAMING SYSTEM WITH REMOTE TERMINALS

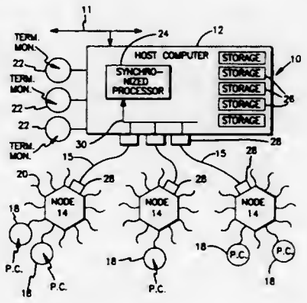
Julian Menashe, 54 Copley Park, London SW16 3DB, United Kingdom

Filed May 19, 1994, Ser. No. 252,538

Claims priority, application South Africa, May 19, 1993, 93/3483

Int. Cl.[6] A63F *9/22*

U.S. Cl. 463—41 **17 Claims**



1. A gaming system including a host computer, a plurality of terminal computers forming player stations remote from the host computer, communicating means for connecting each of the terminal computers to the host computer, and program means for operating the terminal computers, the host computer and the communicating means wherein:

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a. each terminal computer has a processor, a video display unit connected to the processor, a data entry means connected to the processor and a terminal communicating means connected to the processor, the communicating means being operable to connect the terminal computer to the host computer via a public telecommunication link;

b. each terminal computer has terminal program means for

b1. establishing communication with the host computer and advising the host computer of a personal password of a player using that terminal computer;

b2. generating simulations to reproduce at least one selected game including a player status during playing of the selected game in response to host data packets received from the host computer; and

b3. generating terminal data packets, each terminal data packet being representative of a response generated by activating the data entry means at the terminal computer, and sending such packets to the host computer at least each time the data entry means is actuated to generate a valid response; and

c. the host computer has host program means for

c1. generating at least one random number for the selected game being played on a terminal computer that is in communication with the host computer within preset criteria for that selected game in response to at least one valid terminal data packet received from that terminal computer;

c2. determining a status for the selected game at least when a predetermined number of random numbers have been generated for the selected game, including when the selected game has been completed and an outcome for that selected game;

c3. storing an account for each password and updating the account associated with the password of the player playing on a terminal computer when the selected game is started and when the selected game is completed, the account being updated in accordance with the amount wagered and the outcome determined by the host computer;

c4. verifying the password of the player attempting to establish communication with said host computer via the terminal computer; and

c5. generating said host data packets for controlling the simulations to be reproduced by the terminal computer.

5,586,938

TOOTHED TORQUE TRANSMITTING DEVICE HAVING REINFORCEMENT RIBS

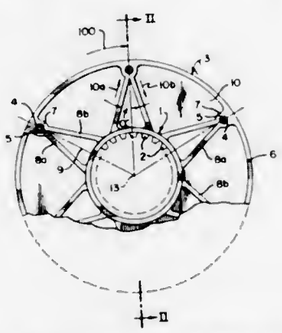
Josef Schürhörster, Rheine, Germany, assignor to KTR Kupplungstechnik GmbH, Rheine, Germany

Filed Feb. 17, 1994, Ser. No. 197,585

Claims priority, application Germany, Nov. 26, 1993, 9318139 U

Int. Cl.[6] F16D *3/56*

U.S. Cl. 464—92 **20 Claims**



1. A device for transmitting torque between a rotary driving component and a rotary driven component, comprising a hub having an axis of rotation and including internal teeth arranged to transmit torque between said hub and one of said components; a flange surrounding said hub and including a plurality of sets of elongated reinforcing elements, said sets being spaced apart from each other in a circumferential direction of said hub and each of said sets including first and second elements which converge toward each other at an oblique angle radially outwardly of said hub, said first and second elements being at least substantially mirror images of each other with reference to a plane disposed between the first and second elements and including said axis; and means for transmitting torque between said flange and the other of said components.

5,586,939

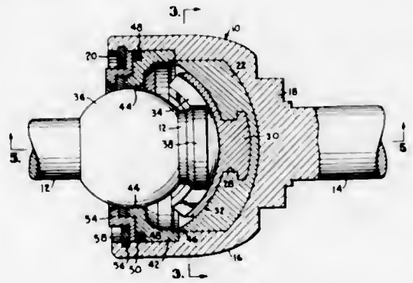
CONSTANT VELOCITY JOINT WITH SPHERICAL BALL AND TONGUE AND GROOVE INTERCONNECTION

Louis E. Swinney, 6333 Long, Suite 200, Shawnee, Kans. 66216

Filed May 25, 1994, Ser. No. 249,301

Int. Cl.[6] F16D *3/16*

U.S. Cl. 464—106 **6 Claims**



1. A constant velocity joint assembly comprising:

a hollow housing closed at one end to define a cup shaped cavity, the other end of the housing being open to define a housing open end and to provide access into the cavity;

an output shaft connected to the housing for rotation therewith;

a rotatably input shaft having an end extending into the cavity through said housing open end and having a longitudinal axis;

means in the cavity interconnecting the input shaft with the housing for rotating the housing at the velocity of rotation of the input shaft uniformly throughout each revolution despite variations in the angle of alignment of the respective input and output shafts, wherein said interconnecting means includes an insert adapted to be received in said cavity, there being an elongated, arcuate groove in the insert, said groove having an open side facing the input shaft;

a link having an elongated, rigid, arcuate rib complementally received in said groove for sliding movement of the rib with respect to the groove, the groove and rib being configured for mutual interlocked relationship to prevent relative separating movement of the groove and rib;

said link having an elongated, rigid, arcuate projection extending transversely to said rib and projecting toward the input shaft;

an elongated arcuate channel extending across the proximal end of the input shaft with said link projection complementally received therein, the channel and the projection being configured for mutual interlocked relationship to prevent relative separating movement of the channel and the projection;

whereby the housing and output shaft are operably coupled to the input shaft for rotation thereby through the insert and said link such that the relative sliding of the link rib and projection in the groove and channel respectively allow relative movement of the joint components to provide said uniform velocity irrespective of the angularity between said shafts; and

seal means interposed across said housing open end and around the input shaft for sealing the cavity against ingress of deleterious materials and egress of lubricant.

5,586,940

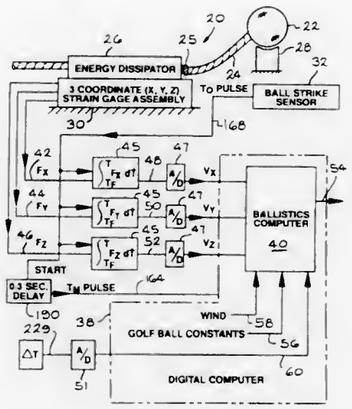
GOLF PRACTICE APPARATUS

Thomas J. Dosch, 83 Briarhill Rd., Orchard Park, N.Y. 14127, and Joseph Dosch, 325 Owasco St., Auburn, N.Y. 13021

Filed Nov. 14, 1994, Ser. No. 339,597

Int. Cl.[6] A63B *69/36*

U.S. Cl. 473—140 **15 Claims**



1. Golf practice apparatus comprising means for tethering a golf ball, means for dissipating kinetic energy of the golf ball when it is struck, means attached to said energy dissipation means for deriving an initial velocity vector of the golf ball in each of x, y, and z directions in a cartesian coordinate system over the period of time during which the kinetic energy is dissipated including means for measuring and time integrating force components measured in the x, y, and z directions during the period of time whereby the untethered trajectory of the golf ball may be computed.

5,586,941

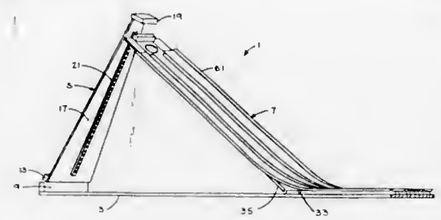
GOLF PUTTING PRACTICE DEVICE

Melvin Klearman, 739 Bergerac Dr., Creve Coeur, Mo. 63141

Filed Jan. 11, 1996, Ser. No. 587,845

Int. Cl.[6] A63B *69/36*

U.S. Cl. 473—160 **23 Claims**



1. A golf putting practice device which will enable a golfer to practice putts of varying distances and conditions which affect the speed and path of a golf ball on a putting green; the device including:

a base including a first end and a second end;

a height indicator arm hingedly connected to the base near said second end;

a pivotal sub-base which is hingedly connected to said base, said sub-base including a fixed end and a free end, said fixed end being connected to said base intermediate said first end and said second end of said base, a portion of said base between said base first end and said fixed end of said pivotal sub-base defining a putting section of said device; said pivotal sub-base defining a ball travel surface and having a hole near said free end, said hole being sized to allow a golf ball to fall therethrough;

a track including a putting end and a hole end, said track being connected to said base putting section and lying over said pivotal sub-base;

said pivotal sub-base being selectively securable to said height indicator arm at a desired point along said height indicator arm.

5,586,942

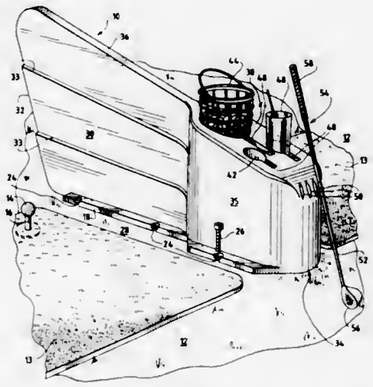
TEE DIVIDER FOR GOLF DRIVING RANGE

Robert Wittek, Sr., Chicago; Aron Cantrell, River Grove, and Terry Sopko, Wood Dale, all of Ill., assignors to Wittek Golf Supply Co., Inc., Chicago, Ill.

Filed Jan. 23, 1996, Ser. No. 590,166

Int. Cl.[6] A63B *5/00*

U.S. Cl. 473—168 **11 Claims**



1. A tee divider for a golf ball driving range comprising, a vertically arranged imperforate wall having a canted upper surface, said wall having laterally extending flange means at the base thereof for anchoring the tee divider at the tee sites, a console-like formation connected to an end of said wall and extending forwardly from and aligned with said wall, said formation having a planer surface at the upper end thereof and upwardly opening storage means in said planar surface for holding articles therein, and liquid drainage means connected with said storage means.

5,586,943

GOLF TRAINING DEVICE

Hailie S. Clay, P.O. Box 326, La Honda, Calif. 94020

Continuation of Ser. No. 340,250, Nov. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 134,419, Oct. 8, 1993, abandoned. This application Jan. 24, 1996, Ser. No. 590,616

Int. Cl.[6] A63B *69/36*

U.S. Cl. 473—214 **18 Claims**

1. A training device mountable to an arm of an athlete for developing a proper arm swing, said arm including first and second arm portions, a first joint between said arm portions and a second joint spaced from said first joint, said training device comprising:

a support body mountable to said arm of said athlete,

sensing means carried by said support body, said sensing means including a first sensor configured for detecting rotation of

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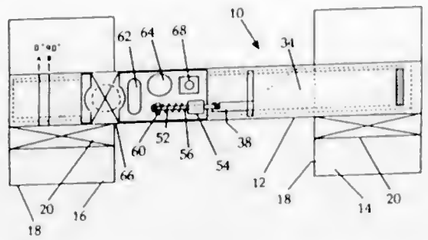


said arm relative to said second joint independent of the position of said first arm portion relative to said second arm portion and a second sensor configured for detecting movement of one of said arm portions relative to the other of said arm portions about said first joint, and

signaling means coupled to said sensing means for producing a detectable signal when movement is detected by at least one of said first sensor and said second sensor.

5,586,944

GOLF CLUB HEAD

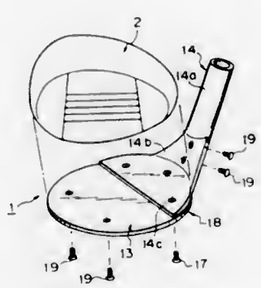
Itsushi Nagamoto; Noburo Sumikawa; Tatsuya Hirakawa, and Tatsuo Nakanishi, all of Shizuoka-ken, Japan, assignors to Yamaha Corporation, Japan

Continuation of Ser. No. 895,210, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 648,598, Jan. 31, 1991, abandoned. This application Oct. 30, 1995, Ser. No. 550,276

Claims priority, application Japan, Feb. 1, 1990, 2-23240; Mar. 31, 1990, 2-86461

Int. Cl.[6] **A63B** *53/02*

U.S. Cl. 473—248 **3 Claims**



1. A golf club, comprising: a shaft

a shell type main body made of fiber reinforced plastic material unsuited for plastic deformation and having a toe side, a heel side and a sole;

a sole piece separably coupled to said sole of said main body; and

a hosel having an upper tubular section for receiving the shaft as an angle with respect to said main body and a lower, easily deformable flattened tongue section adapted to contact said heel side of said main body externally of said main body and being separably coupled to said main body and to said sole piece, said shaft being received in said hosel such that said shaft does not extend into said tongue section and said hosel being made of a metal suited for plastic deformation such that said tongue section of said hosel may be easily deformed with said shaft in said upper tubular section of said hosel to change the angle between said shaft and said main body.

5,586,945

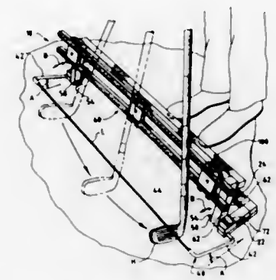
GOLF PUTTING TRAINER

James D. Vonderhaar, 324 Woodside Dr., Bloomingdale, Ill. 60108

Filed Jan. 22, 1996, Ser. No. 589,299

Int. Cl.[6] **A63B** *69/36*

U.S. Cl. 473—258 **11 Claims**



1. A training device for training a golfer to use a putter correctly, the putter having a head and a shaft extending from the head, the training device comprising means for delineating a sight line and means for guiding the shaft as the putter is swung through a limited range, the limited range including an intermediate position, in which the head is positioned in a lowermost position, the limited range including a subrange of back-swing positions, in which the head is raised from the lowermost position, the limited range including a subrange of follow-through positions, in which the head is raised from the lowermost position, the guiding means including a rail defining the limited range and having a guiding surface, along which the shaft is guided with head below the sight line, the rail being curved into a given configuration such that the shaft when guided along the guiding surface is positioned in a position farthest from the sight line when the putter is positioned in the intermediate position with the head positioned in the lowermost position and such that the shaft is positioned in positions closer to the sight line when the putter is swung through the subrange of back-swing positions with the head raised from the lowermost position.

5,586,946

GOLF CLUB HAVING A SEGMENTED, VARIABLE POSITION GRIP ASSEMBLY

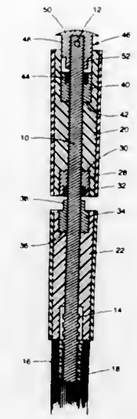
Terry M. Haber, El Toro; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corporation, Lake Forrest, Calif.

Filed Sep. 29, 1995, Ser. No. 537,129

Int. Cl.[6] **A63B** *69/36;53/14*

U.S. Cl. 473—295 **20 Claims**

1. A golf club comprising a cylindrical shaft including a longitudinally extending axis and first and second ends, a club head located at the first end of said shaft, and a grip surrounding the second end of said shaft, said grip having an upper grip member and a lower grip member, each of said upper and lower grip members adapted to be rotated relative to one another around said shaft, and means by which to releasably lock said upper and lower



grip members at the respective positions to which they have been rotated around said shaft.

5,586,947

GOLF CLUBHEAD AND GOLF CLUB FITTED WITH SUCH A HEAD

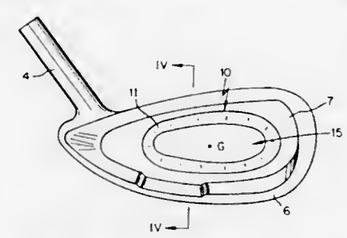
Patrice Hutin, Annecy le Vieux, France, assignor to Skis Rossignol SA, France

Filed Mar. 21, 1995, Ser. No. 408,162

Claims priority, application France, Mar. 22, 1994, 94 03620; Mar. 22, 1994, 94 03621

Int. Cl.[6] **A63B** *53/04*

U.S. Cl. 473—324 **33 Claims**



1. A golf clubhead comprising:

a front strike faces

a sole extending rearwardly from a bottom region of said front strike face; and

vibration damping means provided on at least one surface of the clubhead and comprising constraining means connected to said at least one surface by at least one layer of visco-elastic material, wherein at least one of said constraining means and said at least one layer of visco-elastic material has at least one opening therethrough.

5,586,948

METAL WOOD GOLF CLUB HEAD

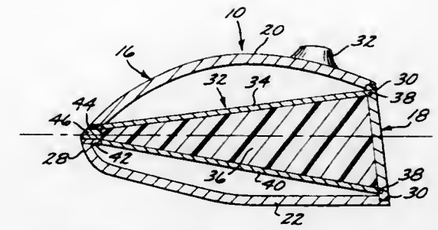
Phillip J. Mick, 7831 Alabama, #16, Canoga Park, Calif. 91304

Filed Apr. 24, 1995, Ser. No. 428,779

Int. Cl.[6] **A63B** *53/04*

U.S. Cl. 473—332 **9 Claims**

1. A golf club head adapted to be secured to a golf club shaft for use in hitting a golf ball, said club head comprising:



a generally hollow metal shell defining a club head body having vertically spaced top and bottom surface portions interconnected by laterally separated toe and heel side portions and longitudinally spaced back and front end portions, said front end portion being substantially open;

a generally flat sided face plate secured to said shell closing said open front end portion, said face plate having an inner face and an outer face for impacting against a golf ball; and

a shock absorbing and reflecting compression insert made of a hard thermosetting polyurethane material disposed within said generally hollow metal shell and extending between said face plate and said back end portion of said club head body, said polyurethane insert having a generally conical shape with an enlarged diameter base end attached to said inner face of said face plate and a small diameter apex end attached to said back end portion of said club head body whereby upon impact of said face plate against a golf ball, compression shock waves produced in said club head body are absorbed and reflected by said insert.

5,586,949

HOLLOW CLUB HEAD WITH SOLE PLATE SUPPORT STRUCTURE

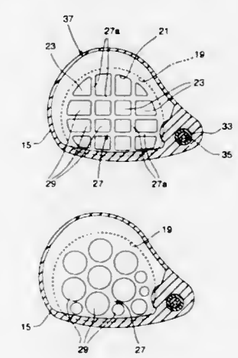
Yuichi Aizawa, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Aug. 1, 1995, Ser. No. 510,099

Claims priority, application Japan, Aug. 5, 1994, 6-184399

Int. Cl.[6] **A63B** *53/04*

U.S. Cl. 473—345 **13 Claims**



1. A golf club head comprising:

a hollow metal head body having a single internal chamber, said head body having a top surface;

a recess portion formed in a sole portion of said head body, said recess portion having a support portion; and

a sole plate made of material greater in specific gravity than said head body, said sole plate being mounted in said recess portion and contacting with said support portion substantially along an inner surface; wherein

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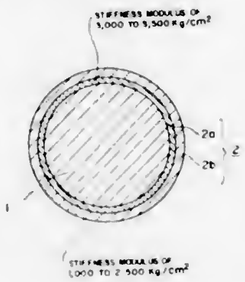
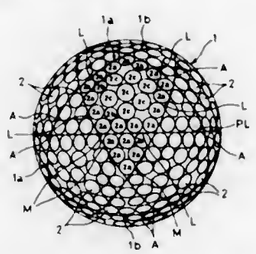
said support portion extends into said single internal chamber no further than a midpoint between said top surface of said head body and said sole portion, and wherein said support portion comprises a plurality of stays extending across said recess in at least two directions and intersecting with each other to form a grid.

5,586,950
GOLF BALL
Seiichiro Endo, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan
Filed Dec. 29, 1994, Ser. No. 365,949
Claims priority, application Japan, Dec. 29, 1993, 5-351591
Int. Cl.[6] A63B *37/12*
U.S. Cl. 473—356 **6 Claims**



1. A golf ball comprising a core and a cover for covering said core, said cover comprising an inner layer cover and an outer layer cover, a stiffness modulus of the inner layer cover being 3,000 to 5,500 kg/cm^2, a stiffness modulus of the outer layer cover being 1,000 to 2,500 kg/cm^2, a thickness of the inner layer cover being 0.5 to 2.5 mm, a thickness of the outer layer being 0.5 to 2.5 mm, a total thickness of the inner layer cover and the outer layer cover being 1.0 to 4.5 mm, a base resin of the inner layer cover containing 5 to 100% by weight of an ionomer neutralized with a zinc ion, and a base resin of the outer layer cover containing 5 to 100% by weight of an ionomer.

5,586,951
GOLF BALL
Michihiko Sugiura, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 19, 1995, Ser. No. 503,923
Claims priority, application Japan, Jul. 21, 1994, 6-169704
Int. Cl.[6] A63B *37/14*
U.S. Cl. 473—379 **13 Claims**



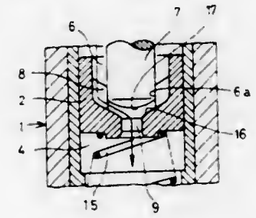
13. A golf ball, comprising:

a substantially spherical surface having a plurality of dimples of differing diameter arranged thereon;

twelve spherical regular pentagons and twenty spherical regular triangles arranged on the spherical surface in a manner corresponding to a dodecaicosahedron (12–20 hedron), each pentagon sharing a same asymmetrical dimple pattern thereon, such that an arrangement of dimples extending across the pentagon from each of five sides of each pentagon differs from the arrangement of dimples extending from each of the four other sides thereof, all of the pentagons sharing the same five differing side arrangements; and

six great circle paths arranged about the spherical surface, each great circle path being bounded on one side thereof by a series of five pentagons each of the five pentagons oriented so that each great circle path is bounded on one side thereof by each of the five differing side arrangements, and wherein a sequence of side arrangements along each great circle path is consistent among all six great circle paths.

5,586,952
HYDRAULIC AUTOTENSIONER
Tomoyoshi Izutsu, and Kazuki Kawashima, both of Iwata, Japan, assignors to NTN Corporation, Osaka, Japan
Filed Jul. 25, 1995, Ser. No. 506,564
Claims priority, application Japan, Jul. 26, 1994, 6-174325
Int. Cl.[6] F16H *7/08*
U.S. Cl. 474—110 **10 Claims**



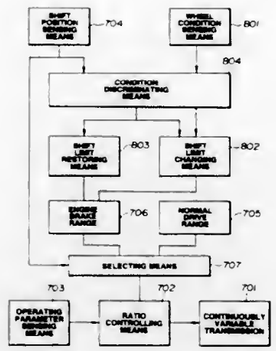
1. A hydraulic autotensioner comprising a body containing hydraulic oil and having a closed bottom, a plunger having a top and a bottom and being slidably mounted in said body with a gap formed therebetween through which hydraulic oil can leak, said plunger being formed with a rod-receiving hole extending from said top of said plunger, and a return passage extending through said plunger from said rod-receiving hole to said bottom of said plunger, a rod having a bottom end inserted in said rod-receiving hole, a rod spring for biasing said rod in such a direction as to protrude out of said body, a plunger spring for urging said plunger against said bottom end of said rod, and a valve seat provided on a surface of said rod-receiving hole so as to be brought into close contact with said bottom end of said rod, whereby said return passage is opened and closed by axial displacement of said rod relative to said valve seat.

5,586,953
SYSTEM FOR CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION IN RESPONSE TO A SENSED WHEEL DECELERATION
Keiju Abo, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jan. 27, 1995, Ser. No. 379,058
Claims priority, application Japan, Jan. 31, 1994, 6-010104; Apr. 11, 1994, 6-072070
Int. Cl.[6] B60K *41/12*
U.S. Cl. 477—47 **20 Claims**

1. A shift control system, comprising:

continuously variable transmission; and

shift controller which controls a transmission ratio of said continuously variable transmission between a maximum ratio and a minimum ratio when a normal drive range is selected, and



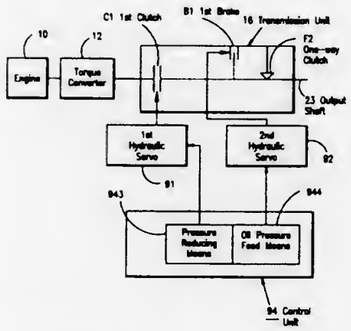
which, when an engine brake range is selected, prevents the transmission ratio from decreasing beyond a shift limit of the engine brake range which is greater than said minimum ratio;

wherein said shift control system further comprises a wheel condition sensing means for sensing a revolving condition of a wheel of a vehicle to determine a wheel deceleration, and said shift controller decreases said shift limit of said engine brake range when the wheel deceleration is equal to or greater than a predetermined deceleration value;

wherein said shift controller comprises a limit changing means for normally holding said shift limit of said engine brake range equal to a normal limit ratio and changing said shift limit to a modified limit ratio which is smaller than said normal limit ratio when the wheel deceleration is equal to or greater than the predetermined deceleration value, and said wheel deceleration is a rate of decrease of a drive wheel speed of the vehicle with respect to time; and

wherein said shift controller comprises a limit restoring means for restoring said shift limit of said engine brake range from said modified limit ratio to said normal limit ratio when said engine brake range is not selected.

5,586,954
CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION
Akihito Iwata, Hekinan; Kazumasa Tsukamoto, Toyota; Kazuhiro Mikami, Kariya; Masahiro Hayabuchi, Anjo, and Yoshihisa Yamamoto, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed Oct. 31, 1995, Ser. No. 551,227
Claims priority, application Japan, Oct. 31, 1994, 6-290570
Int. Cl.[6] F16H *61/20*
U.S. Cl. 477—93 **16 Claims**



1. A control system for an automatic transmission, the automatic transmission including a speed change unit with an output shaft and a fluid transmission unit for transmitting the rotation of an engine to the speed change unit, said control system comprising:

a clutch which is applied responsive to selection of a forward running range;

a one-way clutch which becomes locked when said clutch is applied, to establish a forward first speed;

a brake for locking said one-way clutch to prevent reverse rotation of the output shaft of the speed change unit;

a first hydraulic servo including a first piston for applying said clutch by a piston stroke responsive to receipt of an oil pressure;

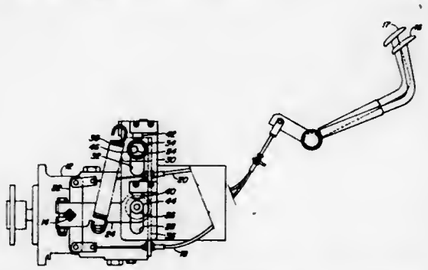
a second hydraulic servo including a second piston for applying said brake by a piston stroke responsive to receipt of an oil pressure; and

a control unit for controlling the oil pressures fed to said first hydraulic servo, said control unit comprising:

oil pressure feed means for feeding oil pressure to said second hydraulic servo responsive to selection of a forward running range, provided the vehicle is substantially stopped, the engine is idling and the foot brake is engaged; and

pressure reducing means for starting reduction of the oil pressure in said first hydraulic servo upon expiration of a set time period to start transition of the clutch from the applied state to the slipping state, at or after completion of the piston stroke of said second hydraulic servo.

5,586,955
NEUTRAL START MECHANISM FOR A HYDROSTATIC TRANSMISSION
Lee J. Wanie, Horicon, Wis., assignor to Deere & Company, Moline, Ill.
Filed Aug. 11, 1995, Ser. No. 514,279
Int. Cl.[6] F16H *63/36*
U.S. Cl. 477—99 **3 Claims**



1. A neutral start linkage mechanism for a vehicle having a hydrostatic transmission having a pivotable input control shaft which controls the hydrostatic transmission, said mechanism being operatively coupled with the input control shaft, said mechanism comprising:

an operator engaged control,

a first arm member operatively fixed with the input control shaft of the hydrostatic transmission,

a first engagement member coupled with the first arm member

a second arm member which extends generally at an angle to the first arm member, said second arm member having

a first slot within which the first engagement member is received,

a second slot within which is received a second engagement member which is rigidly fixed with the vehicle during vehicle operation,

said linkage mechanism having forward, neutral and reverse modes; in the neutral mode the input control shaft is in a position whereat the transmission is placed in a neutral non-driving mode and the first and second engagement members are positioned within the end portions of the respective first and second slots; in the forward mode the input shaft has pivoted in a first direction for shifting the transmission to a

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forward driving mode and the first arm means pivots therewith which forces the first engagement member toward the end portion of the first slot and forces the second arm member to shift relative to the second engagement member such that the second engagement member shifts out of the end portion of the second slot; in the reverse mode the input control shaft is pivoted in a second direction for shifting the transmission to a reverse driving mode and the first arm member pivots therewith such that the first engagement member shifts out of the end portion of the first slot and the second engagement member remains positioned within the end portion of the second slot for generally blocking the second arm member from shifting,

a biasing means extending between the first and second arm members for biasing the linkage to its neutral mode when the operator releases the operator engaged control, and

first and second switch means for detecting the presence of the respective first and second engagement members within the end portions of the first and second slots when the linkage mechanism is in the neutral mode, and said switches are operatively connected with the vehicle power source for preventing the power source from being started by the operator when either of the first or second engagement members are not positioned within the end portion of the respective first or second slot.

5,586,956

Patent Not Issued For This Number

5,586,957

ADJUSTABLE LENGTH, ADJUSTABLE WEIGHT, ADJUSTABLE SHOCK ABSORPTION, MULTI PURPOSE EXERCISE POLES WITH ELECTRONICS PACKAGE

William T. Wilkinson, P.O. Box 572, Crownsville, Md. 21032-0572, assignor to William T. Wilkinson, Salem, N.J.

Continuation-in-part of Ser. No. 846,053, Mar. 5, 1992, abandoned. This application Sep. 4, 1992, Ser. No. 941,304

Int. Cl.[6] A63B *71/00*

U.S. Cl. 482—74 **22 Claims**

1. A pole device far the aiding of forward movement comprising:

(a) at least one shaft forming a pole, said pole has a top end and a bottom end,

(b) handle attached to said shaft at the top end of the pole,

(c) means for exercising a user's arms during the course of forward movement of the user's legs, during relative movement of the user's arms with respect to the user's body while said handle is gripped by the user's hand during the course of forward movement of the user's legs,

(d) at least one weight being attached to the outside of said shaft below the handle, or with said weight being dropped in the top of said shaft or said weight being attached as said handle,

(e) said handle is attached to a top end of said device and said handle is capable of being gripped by user's hand, said device having a bottom end, said device being of sufficient length for the user to grip said handle during the course of forward movement while said bottom end of said device touches a ground surface,

(f) the touching of said bottom end with the surface comprising a push off means to assist the user in moving forward and

(g) an electronics package which comprises at least one component selected from the group consisting of a clock, pedometer, stopwatch, pulse meter, hour chime, alarm, am/fm radio, am/fm cassette, cassette, compact disc player and a day and/or date display wherein said electronics package is attached to the top of the shaft.

5,586,958

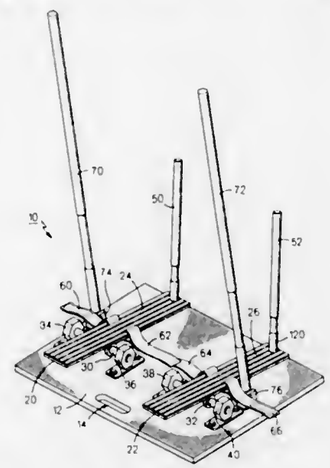
LOWER LEG EXERCISE DEVICE

Oscar L. Little, Sr., P.O. Box 2621, Danbury, Conn. 06813

Division of Ser. No. 344,944, Nov. 25, 1994, Pat. No. 5,487,711. This application Oct. 16, 1995, Ser. No. 543,557

Int. Cl.[6] A63B *23/04*

U.S. Cl. 482—79 **4 Claims**



1. A lower leg exercise device, comprising:

(a) a base member;

(b) two, elongate, parallel plates attached to rotating means mounted on said base member;

(c) support means disposed at distal ends of said plates to accommodate thereon selected weights, said support means comprising posts extending upwardly from upper surfaces of said plates;

(d) a proximal end of each of said posts is rotatably fixedly attached to a horizontal shaft which is journaled in a support fitting attached to a said plate; and

(e) a cylindrical collar is movable between a first, lowered position in which said collar engages both a lower end of said post and said support fitting, thus locking said post in a position orthogonal to said plate when said device is in use, and a second, raised position, permitting said post to be folded down on said plate for storage or transport when said device is not in use; such that a person standing on said plates, with a foot disposed over each of said rotating means, moves said weights between a first, lowered position and a second, elevated position by alternatingly flexing and relaxing muscles in the person's lower leg.

5,586,959

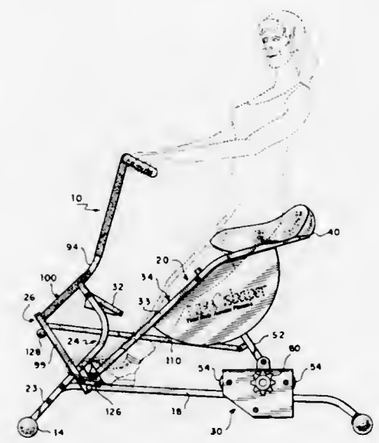
EXERCISE MACHINE

Joseph E. Adkins, P.O. Box 7758, Huntington, W. Va. 25776, and Jeffrey A. Adkins, 174 Iroquois Trail, Ona, W. Va. 25545

Filed Dec. 20, 1995, Ser. No. 575,548

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—96 **8 Claims**



6. An exercise machine comprising:

a support frame including a longitudinal rail;

a handlebar and footrest assembly pivotally attached to said support frame;

a seat assembly including an elongated seat support member and a seat, said seat support member having a proximate end and a distal end, said proximate end pivotally attached to said support frame, said seat attached to said distal end of said seat support member;

a seat riser arm having a first end and a second end, said first end pivotally attached to said seat support member;

a glide assembly attached to said second end of said seat riser arm, said glide assembly riding on said longitudinal rail of said support frame;

adjustable friction means for controlling resistance to motion of said glide assembly along said longitudinal rail; and

a linkage bar having a front end and a rear end, said front end pivotally attached to said handlehar and footrest assembly and said rear end pivotally attached to said seat riser arm.

5,586,960

Patent Not Issued For This Number

5,586,961

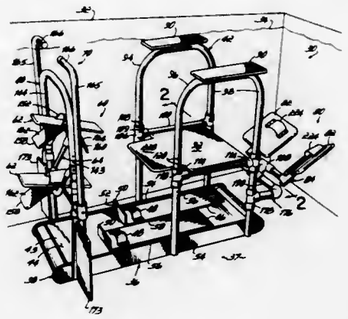
AQUATIC EXERCISE EQUIPMENT

Jeffrey T. Quint, 6641 Smith Rd., Cincinnati, Ohio 45140

Continuation-in-part of Ser. No. 189,072, Jan. 28, 1994, Pat. No. 5,378,213. This application Dec. 28, 1994, Ser. No. 365,209

Int. Cl.[6] A63B *21/008*

U.S. Cl. 482—111 **50 Claims**



1. An exercise machine utilizing a resistance of a liquid comprising:

a frame structure adapted to be submerged in the liquid;

a first exercise device including a pair of actuating elements rotatably mounted to the frame structure to move in a generally circular path and adapted to be submerged in the liquid, each of the actuating elements having an upper surface adapted to be pushed by a user and a lower surface to provide resistance to motion of the actuating elements in the liquid in response to actuation by a user;

a second exercise device including a pair of actuating elements rotatably connected to the frame structure and adapted to be submerged in the liquid, each of the actuating elements moving in a reciprocating motion having an upper surface adapted to be pushed by a user and a lower surface to provide resistance to motion of the actuating element in the liquid in response to actuation by the user; and

a third exercise device including a pair of actuating elements operably mounted on the frame structure and adapted to be submerged in the liquid, the actuating elements adapted to be operated by a user and having surfaces providing resistance to reciprocating motion of the actuating elements in the liquid in response to actuation by the user.

5,586,962

MULTIPLE SPORT TRAINING AND EXERCISE APPARATUS

Timothy M. Hallmark, 2799 Kuykendall, Bellville, Tex. 77418

Filed Jan. 26, 1995, Ser. No. 378,399

Int. Cl.[6] A63B *21/02*

U.S. Cl. 482—129 **16 Claims**

1. A multiple sport training, exercise, and rehabilitation apparatus comprising:

a frame having two upright members with a plurality of cross bar members between the upright members;

a base stabilizing the frame in a vertical position;

one or more elastic ropes as the means for producing a resistive force, each of said elastic ropes having at least one end attached to the apparatus and the other end of the rope attachable to an exerciser; and

at least one clamp per each elastic rope provided on the frame for releasably engaging the elastic ropes whereby the length of the elastic rope is adjustable thereby producing resistance

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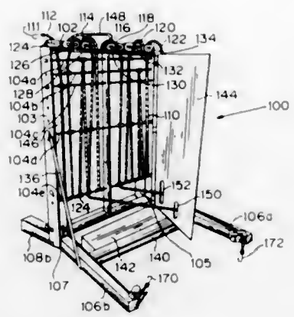


by the elastic ropes which may be varied according to the length of elastic rope clamped.

5,586,963

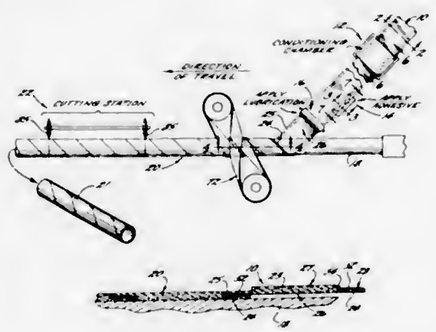
SINGLE-PLY PAPERBOARD TUBE AND METHOD OF FORMING SAME

George E. Lennon, Newport, Tenn.; James R. Martin, and Charles D. Anderson, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 27, 1994, Ser. No. 265,999

Int. Cl.[6] B31C *3/00;3/04*

U.S. Cl. 493—299 **19 Claims**



1. A method of producing a paperboard tube comprising the steps of:

conditioning a continuous paperboard ply defined in transverse cross-section by a pair of thin longitudinal edge portions and a thicker central portion disposed therebetween, each of said thin portions having a predetermined uniform width and a substantially constant thickness, said thicker central portion having a predetermined uniform width substantially greater than the width of said edge portions and a substantially constant thickness that is greater than the thickness of said edge portions, said conditioning raising the moisture content of the paperboard ply by an amount of at least about 1.0 percent, based on the dry weight of the ply;

applying a layer of permanent adhesive layer to a first edge portion on a first side of said conditioned paperboard ply; and

spirally winding said paperboard ply onto a mandrel in edge overlapping relation so that the second edge portion of the paperboard ply overlaps the adhesive coated face of the first edge portion, thereby forming a permanently bonded, continuous paperboard tube.

5,586,964

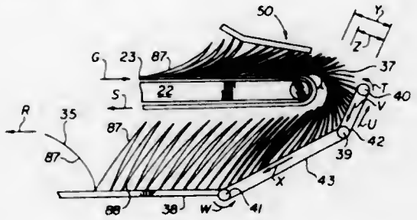
SYSTEM FOR DELIVERING FOLDED PAPER

Walter W. Chase, Glendale, Ariz., assignor to B. Bunch Company, Inc., Phoenix, Ariz.

Filed Nov. 2, 1994, Ser. No. 333,215

Int. Cl.[6] B31B *3/02;* **B65H** *20/00*

U.S. Cl. 493—413 **3 Claims**



3. Apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including

(a) a frame,

(b) guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite directions,

(c) folding means carried on said frame and operatively associated with said guide means for urging said paper distributed by said guide means into a zig-zag folded condition,

(d) a generally horizontally oriented conveyor assembly for receiving folded paper from said folding means, forming a stack of the folded paper, and carrying said stack of folded paper away from said folding means in a first direction of travel, said stack including

(i) first and second groups of folded edges, said first group of folded edges contacting said conveyor assembly, said second group of folded edges being generally spaced apart from and extending above said first group of folded edges and said conveyor assembly, and

(ii) a plurality of upstanding sheets each bounded by a parallel pair of said folded edges and canted in said first direction of travel, alternating ones of said sheets each being connected to and overlaying the one of said first group of said folded edges connected to the immediately preceding one of said sheets, and laying on and contacting a portion of said immediately preceding one of said sheets extending from said one of said first group of said folded edges such that said portion of said immediately preceding one of said sheets is pressed against said conveyor assembly;

(e) inverting means for turning over said stack of folded paper, said inverting means comprising

(i) means for receiving said stack of folded paper from said conveyor assembly and incrementally displacing said sheets downwardly around to move said stack in a second direction of travel rearwardly from said first direction of travel onto a support surface such that after said stack of folded paper is inverted onto said support surface, said first group of folded edges are spaced above said second group of folded edges, and said sheets in said stack of folded paper are in a substantially upright orientation facilitating feeding said sheets into another paper processing machine; and,

(ii) means for contacting, moving, and guiding said second group of folded edges downwardly in said second direction of travel and to facilitate the displacement of said sheets downwardly in said second direction of travel rearwardly from said first direction of travel onto said support surface in said substantially upright orientation.

5,586,965

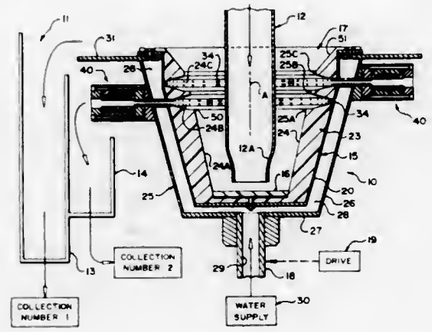
CENTRIFUGAL SEPARATOR WITH CONICAL BOWL SECTION AND AXIALLY SPACED RECESSES

Benjamin V. Knelson, 20321-86th Ave., Langley, British Columbia, Canada

Filed May 11, 1995, Ser. No. 439,273

Int. Cl.[6] B04B *11/00;* **B01D** *43/00*

U.S. Cl. 494—29 **16 Claims**



1. An apparatus for separating intermixed materials of different specific gravity comprising:

a centrifuge bowl having a base and a peripheral wall surrounding an axis passing through the base and generally upstanding from the base to an open mouth;

means mounting the bowl for rotation about the axis;

feed means for feeding the intermixed materials into the bowl so that during rotation of the bowl the intermixed materials flow over the peripheral wall for discharge from the open mouth;

first guide means for collecting the materials discharged from the open mouth;

at least one annular recess on the peripheral wall over which the materials pass so that heavier material collects in the recess and lighter material passes over the recess to the open mouth for discharge from the open mouth;

said at least one recess being defined by a lower side wall and an upper side wall which extend generally outwardly of the axis to an outer base of said at least one recess;

fluidizing means for fluidizing said heavier material in said at least one annular recess comprising a plurality of openings through the peripheral wall at said at least one recess and fluid injection means outside the peripheral wall for injecting fluid through the openings;

and second guide means for collecting the heavier materials from said at least one recess;

wherein said feed means comprises a feed duct extending into the bowl to a discharge mouth positioned adjacent said base of the bowl such that the feed materials are fed from the discharge mouth to move to the peripheral wall for said flowing movement over the peripheral wall;

and wherein said peripheral wall of the bowl includes a frusto-conical portion which extends axially of the peripheral wall from a lower end on the peripheral wall arranged for receiving said feed materials from the discharge mouth to an upper end of the frusto-conical portion which is axially spaced from the discharge mouth;

said frusto-conical portion being substantially smooth and substantially imperforate and increasing in diameter from said lower end to said upper end;

said at least one recess being arranged such that the lower side wall thereof connects with the upper end of the frusto-conical portion and extends outwardly relative to the axis from the upper end of the frusto-conical portion;

said at least one recess thus being axially spaced from the discharge mouth by at least a part of an axial length of the frusto-conical portion such that the feed materials pass over said at least a part of the axial length of the frusto-conical portion before reaching said at least one recess.

5,586,966

APPARATUS AND METHOD FOR SEPARATING SOLID/FLUID MIXTURES

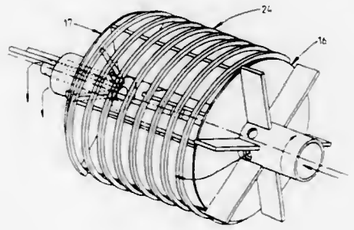
Warwick N. Wood, Cheltenham, Australia, assignor to Warman International Limited, Artarmon, Australia

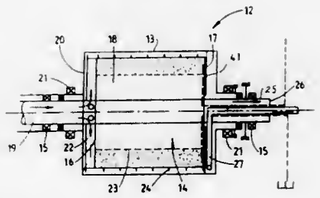
Continuation of Ser. No. 307,777, Oct. 7, 1994, abandoned. This application Mar. 18, 1996, Ser. No. 616,934

Claims priority, application Australia, Apr. 10, 1992, PL1857

Int. Cl.[6] B04B *1/20*

U.S. Cl. 494—37 **12 Claims**





1. Apparatus for separating materials into a heavier component and a lighter component comprising:

a main body;

a rotor disposed within said main body, said rotor and said main body being rotatable about axes of rotation; said rotor comprising:

first and second end walls spaced apart from one another with a rotor chamber therebetween, and a plurality of generally radially extending blades extending between said first and second end walls and separating said rotor chamber into a plurality of sub-chambers;

a feed inlet chamber between said main body and said first end wall;

said first and second end walls having a circumferential clearance for permitting the flow of material into and the discharge of the heavier component out of the rotor chamber; and

a generally centrally disposed discharge in communication with the rotor chamber for discharging the lighter component from a radially inner portion of the rotor chamber, said sub-chambers being open in a radially inward direction with respect to the rotor's axis of rotation and being arranged with respect to said centrally disposed discharge so that said lighter component flows in said radially inward direction through said sub-chambers and directly into said centrally disposed discharge.

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5,586,967

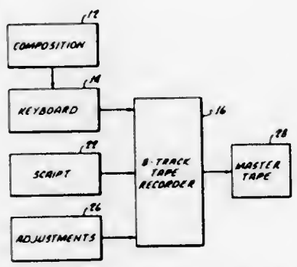
METHOD AND RECORDING FOR PRODUCING SOUNDS AND MESSAGES TO ACHIEVE ALPHA AND THETA BRAINWAVE STATES AND POSITIVE EMOTIONAL STATES IN HUMANS

Mark E. Davis, 21711 Wesley, Apartment D, Laguna Beach, Calif. 92677

Continuation-in-part of Ser. No. 939,088, Sep. 2, 1992, Pat. No. 5,352,181. This application Jun. 27, 1994, Ser. No. 267,149

Int. Cl.[6] A61M *21/00*

U.S. Cl. 600—28 **5 Claims**



1. A method for producing an audio tape for use in achieving alpha and theta brainwave states and effecting positive emotional states in humans to enhance learning and self-improvement, said method comprising:

recording on an audio tape, a musical composition having an initial tempo;

during recording of the musical composition, reducing the initial tempo over a length of the musical composition until a final tempo is reached at an end of the musical composition; and

recording on an audio tape, in synchrony with the reducing initial tempo of the musical composition, a plurality of verbal phrases, said verbal phrases being recorded with between one and approximately eight words per phrase, and with pauses between verbal phrases having a duration of between approximately four and approximately eight seconds.

5,586,968

METHOD AND APPARATUS FOR MOVING AN ENDOSCOPE ALONG A CANAL-SHAPED CAVITY

Andreas Gründl, Haseneystrasse 20, D-81377 München; Alexander Bob, Rahnfelsstrasse 9A, D-68163 Mannheim, and Konstantin Bob, Weberstrasse 17, D-69469 Weinheim, all of Germany

PCT No. PCT/EP93/03570, § 371 Date Jan. 3, 1995, § 102(e) Date Jan. 3, 1995, PCT Pub. No. WO94/13188, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 15, 1993, Ser. No. 284,568

Claims priority, application Germany, Dec. 15, 1992, 42 42 291.4

Int. Cl.[6] A61B *1/00*

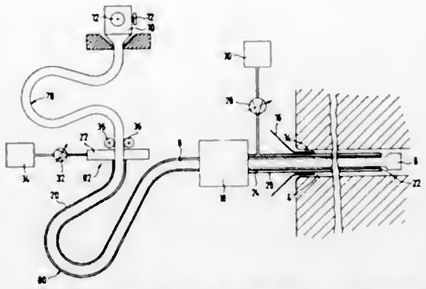
U.S. Cl. 600—114 **13 Claims**

5. An assemblage for examining the interior of a canal-shaped cavity, said assemblage comprising:

a) an endoscope having a movable distal end for positioning within the cavity, and having an opposite stationary operating end for positioning outside of the cavity;

b) a turnout tube embracing a portion of the endoscope, said turnout tube having a movable turnout area for positioning within the cavity, and having an opposite fixed end for positioning outside of the cavity;

c) drive means disposed between said movable distal end and said stationary operating end of said endoscope, said drive means being operable to advance and retract said endoscope in said cavity; and



d) means for providing slack in said endoscope between said movable distal end and said stationary operating end of said endoscope so as to allow said movable distal end of said endoscope to be moved away from said stationary operating end of said endoscope without moving said operating end of said endoscope.

5,586,969

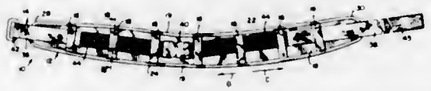
REVERSIBLE SUPPORT BELT

Edward H. Yewer, Jr., 6259 N. Highway 83, Hartland, Wis. 53029

Filed Jun. 16, 1995, Ser. No. 490,928

Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—19 **16 Claims**



1. In a support belt for wearing around the waist of a human body of the type having a body with an inner surface, an outer surface and longitudinal side edges connecting said inner and outer surfaces, and a cinching strap narrower than said body and having an inner surface, an outer surface and longitudinal side edges connecting said inner and outer surfaces for encircling said body when said belt is worn around the waist of a human body, the improvement wherein;

said longitudinal side edges of said body are arcuate over the length of said body and curve in the same direction;

said strap can be detachably removed from said body; and

said strap includes at least two inextensible and straight strips joined end to end by an intermediate bridging section which is flexible so as to allow said strips to form an angle relative to one another as said strips lay against said body.

5,586,970

ARTICULATING ADJUSTABE CONDYLAR PAD FOR KNEE BRACE

John Morris, Castro Valley, and Gary Stafford, Hayward, both of Calif., assignors to Orthopedic Technology, Inc., Tracy, Calif.

Filed Jan. 23, 1995, Ser. No. 379,313

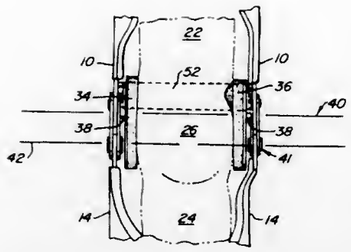
Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—26 **5 Claims**

1. An improved knee brace comprising:

a thigh brace portion mountable to the user's upper leg, the thigh brace portion including medial and lateral struts, said struts extending rigidly from said thigh brace portion downward to and through a hinge axis;

a lower leg portion, said lower leg portion including medial and lateral struts extending upwardly from said lower leg portion to and towards a hinge axis on either side of said leg;



a simple hinge mounted between said upper and lower struts on both sides of said knee brace, said simple hinge enabling pivot of said thigh brace portion relative to said lower leg portion along a first substantially horizontal hinge axis between positions of extension and flexion when mounted to the knee of a wearer;

medial and lateral condylar pads pivotally secured to the thigh brace portion of pivotal movement generally along a second substantially horizontal medial and lateral pivot pad axis, parallel to but offset from said first substantially horizontal hinge axis of said simple hinge, said second substantially horizontal medial and lateral pivotal pad axis spaced apart from the above first substantially horizontal axis of said hinge of said brace by a distance approximating articulation of said simple hinge axis from said thigh brace portion to follow the changing center of pivot of said knee during extension and flexion of said knee;

each said medial and lateral condylar pads including a first cam slot at said pivot for enabling said pad to move on said pivot towards and away from said pivot; and,

each said medial and lateral condylar pads further including a second cam slot between said thigh brace portion and said pad for constraining said medial and lateral condylar pads to move on said pivot towards and away from said pivot to further approximate articulation of said simple hinge axis from said thigh brace portion to follow the changing center of pivot of said knee during extension and flexion of said knee.

5,586,971

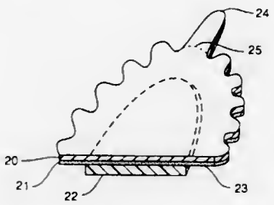
INVISIBLE BANDAGE ASSEMBLY

Nancy M. Newman, 819 Spring Dr., Mill Valley, Calif. 94941

Continuation of Ser. No. 964,339, Oct. 21, 1992, Pat. No. 5,368,553, which is a continuation-in-part of Ser. No. 729,463, Jul. 12, 1991, abandoned. This application Nov. 29, 1994, Ser. No. 346,084

Int. Cl.[6] A61F *13/00;15/00*

U.S. Cl. 602—58 **1 Claim**



1. A bandage assembly comprising tape, wherein said tape is a three layer laminate consisting of

(a) an upper paper backing layer,

(b) an underlying pressure-sensitive adhesive layer which is coterminous in size with said upper paper backing layer, and

(c) a central wound release layer which does not adhere to wounds or blemishes; is not coterminous in size with said upper paper backing layer and the underlying pressure-sensitive adhesive layer and thereby providing a peripheral ring of exposed adhesive

and further wherein said assembly has a scalloped edge and a removable tab.

5,586,972

CREPE EFFECT BANDAGE

John C. Evans, Newhey, United Kingdom, assignor to Smith & Nephew plc, London, United Kingdom

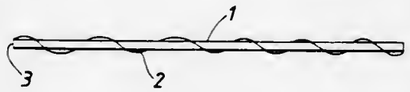
PCT No. PCT/GB93/00958, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO93/22994, PCT Pub. Date Nov. 25, 1993

PCT Filed May 10, 1993, Ser. No. 331,631

Claims priority, application United Kingdom, May 9, 1992, 9210036

Int. Cl.[6] A61L *15/00*

U.S. Cl. 602—76 **21 Claims**



1. A woven bandage which exhibits a crepe effect characterised in that the bandage contains textured filament warp yarns and composite warp yarns comprising a staple fibre yarn and a textured filament yarn twisted together.

5,586,973

METHOD AND DEVICE FOR CONTROLLED IRRIGATION AND SUCTIONING OF A LIQUID CLARIFICANT DURING ENDOSCOPIC SURGERY

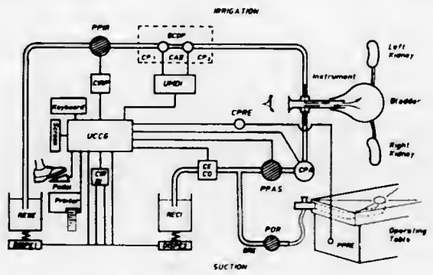
Ivan Lemaire, St Didier au Mont d'Or, and Bertrand Gonon, Lyon, both of France, assignors to C & D Biomedical S.A., Ecully, France

Continuation-in-part of Ser. No. 962,210, Dec. 18, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 353,879

Claims priority, application France, Apr. 22, 1991, 91 04969; WIPO, Apr. 22, 1992, PCT/FR92/00362

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—19 **15 Claims**



1. Apparatus for the controlled irrigation and suctioning of a liquid clarificant in a cavity or a natural passageway in the human body during a surgical procedure with an endoscopic surgical instrument having an injection conduit for injecting liquid clarificant into the cavity or natural passageway and a suction conduit for suctioning liquid clarificant from the cavity or natural passageway, the apparatus comprising:

an irrigation branch for connection to the injection conduit of the instrument and a suction branch for connection to the suction

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conduit of the instrument, each of said branches having at least one pressure sensor and a pump;

the irrigation branch comprises, in sequence commencing from an end of the irrigation branch remote from the instrument: (a) a reservoir (RESE) for storing the liquid clarificant, the reservoir being supported by a first weighing means (DISPE1) for weighing the liquid clarificant contained in the reservoir (RESE); (b) a peristaltic irrigation pump (PPIR) with a flow regulator; and (c) a pressure differential sensor block (BCDP) formed by a pair of irrigation pressure sensors (CP1 and CP2), interconnected by a calibrated Venturi conduit (CAB), for measuring a respective pair of irrigation pressure values (P1 and P2);

the suction branch comprises, in sequence, commencing adjacent the outlet of the instrument: (a) a pressure sensor (CPA) to measure downstream pressure (P3); (b) a peristaltic suction pump (PPAS) with a flow regulator; (c) a recovery pump (POR) connected to a recovery branch (BRE), which is in turn connected to a collection device on the operating table; (d) a conductimetric cell (CECO) which measures hemodilution; and (e) a receptacle (RECI) for recovering liquid clarificant, the receptacle (RECI) being supported by a second weighing means (DISPE2) for weighing the liquid clarificant recovered by the receptacle;

the entire system being connected to a central processing and control unit (UCCG) having a flowmeter measurement device (UMDI) for determining an irrigation flow rate (PPIR) in the irrigation branch from the difference between the pair of irrigation pressure values (P1 and P2) measured by the pair of irrigation pressure sensors (CP1 and CP2), and a control circuit (CIRP) for controlling the irrigation pump in response to the determined irrigation flow rate (PPIR) and thereby controlling an interior cavity pressure (PI) inside the cavity or natural passageway, and

the first and second weighing devices (DISPE1 and DISPE2) are each connected to means for comparing the measurement results of each device with each other, and a reference pressure sensor (CPRE) for measuring a reference pressure is connected to the processing and control unit (UCCG) in order to compare the measured reference pressure with the pressures measured by the other pressure sensors and thereby determine corresponding relative pressures with regard to the reference pressure.

5,586,974

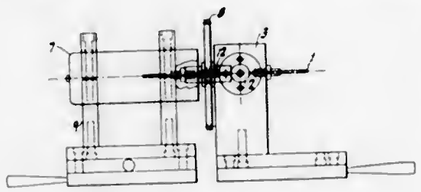
CONTINUOUSLY ADJUSTABLE HIGH FLOW INSUFFLATOR VALVE

Marcus J. Martinez, and Anthony S. Tafoya, both of Albuquerque, N.M., assignors to Olympus America, Inc., Lake Success, N.Y.

Filed Apr. 25, 1995, Ser. No. 428,381

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—26 **17 Claims**



1. A valve comprising:

a) an inlet for receiving fluid flow from a fluid source;

b) a chamber fluidly coupled with the inlet;

c) a chamber outlet fluidly coupled to the chamber;

d) a perforated disk having at least one perforation;

e) an outlet;

f) a dynamic seal, the dynamic seal having a dynamic seal inlet fluidly coupled with the chamber outlet, and a dynamic seal outlet fluidly coupled with the outlet, and arranged about the perforated disk such that, when the at least one perforation of the perforated disk is aligned with the dynamic seal inlet and the dynamic seal outlet, the dynamic seal inlet is fluidly coupled to the dynamic seal outlet;

g) a controllable device for rotating the perforated disc; and

h) a pressure sensor for sensing the pressure in the chamber.

5,586,975

AIR AND LIQUID TIGHT CONTAINER WITH A SLIDABLE GASKET

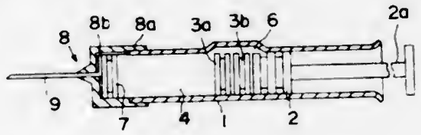
Nobuo Tanaka, Mishima-gun; Seiji Otani, Toyono-gun; Hiroyuki Kawakita, Suita, and Teruo Matsuda, Chiyoda-ku, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, and Arte Corporation, Tokyo, both of Japan

Filed Dec. 29, 1994, Ser. No. 365,947

Claims priority, application Japan, Feb. 18, 1994, 6-021485

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—89 **10 Claims**



1. An apparatus comprising

a tubular body having an inside wall, an inside space, a front open end, a rear open end and an inside diameter r;

a front gasket slidable in said tubular body, said front gasket separating said inside space into a front compartment and a rear compartment, and each of said compartments having a substance therein;

a rear gasket that is capable of being connected to a push rod so as to function as a plunger, said front gasket being slidable in said tubular body in response to sliding of said rear gasket in said tubular body;

a bypass located between said front gasket and said front open end, said bypass having an axial length along said tubular body, and said bypass permitting the substance in said rear compartment to be introduced into said front compartment;

wherein said front gasket comprises a first front gasket arranged on the rear side of said bypass and a second front gasket arranged behind said first front gasket, said first and second front gaskets being axially slidable independently of each other upon sliding of said rear gasket in said tubular body by the push rod;

wherein said first and second front gaskets have a combined axial thickness less than said axial length of said bypass such that, when said first and second front gaskets are slid to said bypass, the substance in said rear compartment can be introduced into said front compartment through said bypass;

wherein each of said front and rear gaskets has at least two annular ribs sealingly engaging said inside wall of tubular body;

wherein each said annular rib has an uncompressed outside diameter R; and

wherein said front and rear gaskets are disposed in said tubular body such that a compressibility C (%) of said ribs, defined as $C(\%)=(R-r)/R\times 100$, is in a range of 2% to 10%, inclusive, and the product of the compressibility and the contact area (mm^2) of said ribs with said inside wall of said tubular body is within a range of 150 to 400.

5,586,976

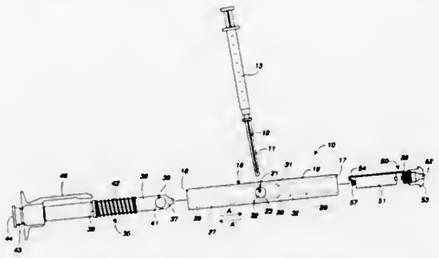
MEDICAL SYRINGE NEEDLE SHEATH HOLDING DEVICE

Vincent M. Coutoumanos, 8512 Steeple Ridge, North Richland Hills, Tex. 76180

Filed Oct. 11, 1995, Ser. No. 540,962

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—192 **9 Claims**



1. A portable, hand-held pocket safety device for removing and replacing a needle sheath for the needle of a syringe with the risk of contact with the needle minimized, comprising:

a holder body having a sheath receiving passage formed therethrough;

a plunger means received within said holder body and movable through said holder body, said plunger means including an aperture formed therealong and adapted to be alignable with said sheath receiving passage of said holder body as said plunger means is moved along said holder body; and

means for automatically biasing said plunger means along said holder body so as to move said aperture of said plunger means away from alignment with said sheath receiving passage upon release of said plunger means, such that said plunger means engages and holds a needle sheath received through said sheath receiving passage.

5,586,977

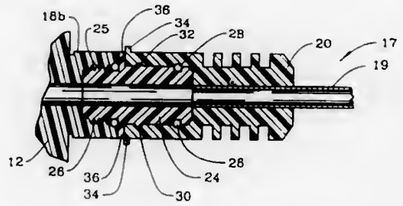
QUICK DISCONNECT FITTING FOR COUPLING INTERCHANGEABLE PROBE TIP TO LAPAROSCOPIC INSTRUMENT

James H. Dorsey, III, Delray Beach, Fla., assignor to C.R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 989,109, Dec. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 470,771, Jan. 26, 1990, Pat. No. 5,188,591. This application Aug. 8, 1994, Ser. No. 286,949

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—264 **5 Claims**



1. A combination surgical valve and surgical probe, said combination comprising:

a surgical probe including a probe shaft, said surgical probe further including an attachment member, said attachment member secured to said probe shaft;

a surgical valve having an inlet and an outlet;

said surgical valve further including a first probe mount member operatively associated with said outlet of said surgical valve;

said probe mount member and said attachment member operatively associated with one another, respectively, providing for rapid engagement or disengagement of said surgical probe to said surgical valve;

engaging means including a groove defined by an inner surface portion of said attachment member and a corresponding collar disposed on an outer surface portion of said probe mount member, said groove and said collar operatively associated with each other to provide a frictional engagement between said attachment member and said probe mount member; and

an o-ring assembly including a notch defined by an outer surface portion of said probe mount member and a second groove defined by an inner surface portion of said attachment member, said notch and second groove housing an o-ring, when said attachment member is removeably secured to said probe mount member said o-ring assembly providing a sealed and aligned relationship between said attachment member and said probe mount member.

5,586,978

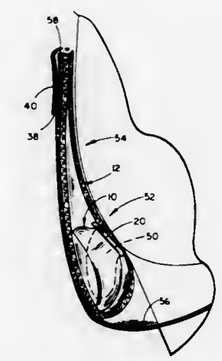
INCONTINENCE DEVICE

Donald E. Bayne, 1465 Holton Rd., Muskegon, Mich. 49445

Filed Nov. 7, 1994, Ser. No. 335,106

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—327 **19 Claims**



1. An incontinence device comprising:

a tray having a body with an opening that extends through said body;

an annular ring surrounding said opening and extending away from said body to a terminal edge, said annular ring having an annular groove, said annular groove opening radially outward from said annular ring;

a flange extending outward from said annular ring to said terminal edge and defining at least a portion of said annular groove, said flange and annular ring formed as a single piece from a moldable material;

at least one drain operatively connected with said body to drain material from within said tray; and

a liquid barrier having an aperture extending through said liquid barrier, said liquid barrier being connected with said tray to define a passage through each of said opening and said aperture said liquid barrier at least partially enveloping said tray.

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5,586,979

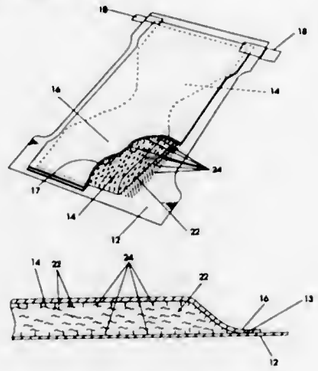
DISPOSABLE ABSORBENT ARTICLE CORE INTEGRITY SUPPORT

Dennis A. Thomas, Cincinnati, Ohio, assignor to The Procter and Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 149,410, Dec. 16, 1993, Pat. No. 5,397,317. This application Nov. 21, 1994, Ser. No. 342,538

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—382 **10 Claims**



1. A disposable absorbent article comprising:

a backing sheet of a flexible sheet material;

a plurality of individual columnar projections disposed on said backing sheet, said projections disposed to project generally normal to said backing sheet;

a mass of absorbent material overlying a portion of said backing sheet and penetrated by at least some of said individual columnar projections.

5,586,980

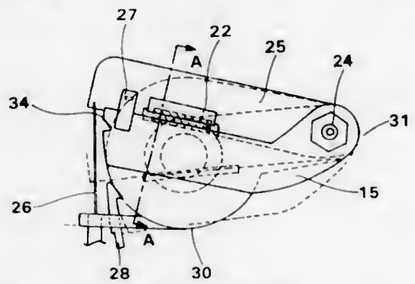
MICROKERATOME

Frederic B. Kremer, 887 Roscommon Rd., Bryn Mawr, Pa. 19010, and Harold E. Clupper, Little Shiloh Rd., West Chester, Pa. 19380

Filed Oct. 14, 1994, Ser. No. 323,177

Int. Cl.[6] A61F *9/00;* **A61N** *5/06*

U.S. Cl. 606—4 **44 Claims**



39. A micro-keratome device comprising:

a vacuum ring, a cutting blade carrier containing a cutting blade, a guard, and an applanation shoe, wherein said cutting blade carrier, said cutting blade and said applanation shoe are mounted on said vacuum ring; said cutting blade is movable independently of said cutting blade carrier so that after making an incision in a cornea of a patient, said cutting blade can be retracted into said cutting blade carrier; said guard maintains incised portions of said cornea during an ophthalmic surgical procedure to be performed on said patient and returns said incised portion to said cornea after said surgical procedure; and said micro-keratome provides an unobstructed pathway to layers of said cornea exposed by displacement of said incised portions without removing said cutting blade carrier from said micro-keratome prior to or during said surgical procedure;

wherein said applanation shoe is pivotally connected to said vacuum ring allowing pivoting motion of said applanation shoe in a plane substantially parallel to a plane projected by said applanation shoe as mounted on said vacuum ring;

wherein said cutting blade carrier is pivotally attached to said applanation shoe, allowing said cutting blade carrier to be pivoted out of said unobstructed pathway during said surgical procedure, after said incision is made;

wherein said micro-keratome further comprises a stop to limit the movement of said cutting blade carrier;

wherein said pivotal attachment of said applanation shoe and said pivotal connection of said cutting blade carrier pivot about the same axis, and said cutting blade carrier and said applanation shoe further comprise means for interlocking said cutting blade carrier and said applanation shoe, one with the other, to allow simultaneous movement of said interlocked cutting blade carrier and applanation shoe in a plane substantially parallel to a plane projected by said vacuum ring as said cutting blade makes said incision, said movement traversing from a first position prior to making said incision wherein said cutting blade carrier and said applanation shoe are interlocked, to a second position, after making said incision, at which point said stop limits movement of said applanation shoe and said cutting blade carrier and said applanation shoe remain interlocked; and

said micro-keratome further comprises means for releasing said interlocking means after said incision is made, when said cutting blade carrier and said applanation shoe are at said second position, said releasing means returning said cutting blade carrier to said first position while said applanation shoe remains in said second position.

5,586,981

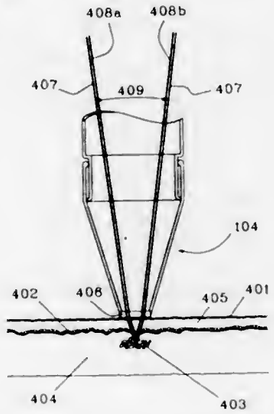
TREATMENT OF CUTANEOUS VASCULAR AND PIGMENTED LESIONS

Xin-Hua Hu, 109 Squire Dr., Winterville, N.C. 28590, assignor to Xin-Hua Hu, Winterville, N.C.

Filed Aug. 25, 1994, Ser. No. 295,987

Int. Cl.[6] A61N *5/06*

U.S. Cl. 606—9 **17 Claims**



1. A method for treatment of cutaneous vascular and pigmented lesions, comprising the steps of:

generating a pulsed beam of laser radiation;

directing the beam to a target region of the skin;

controlling the peak irradiance, the pulse duration and the focal spot size of the beam such that a microplasma is created in the targeted lesion for disruption; and

scanning the beam within a treatment area of the skin.

5,586,982

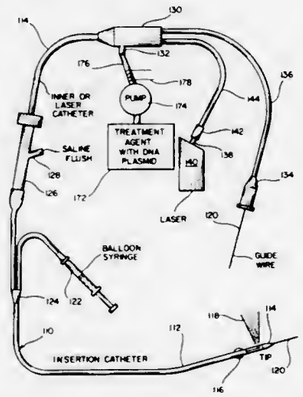
CELL TRANSFECTION APPARATUS AND METHOD

George S. Abela, 80 Longfellow Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 53,206, Apr. 28, 1993, Pat. No. 5,330,467, which is a continuation of Ser. No. 866,473, Apr. 10, 1992, Pat. No. 5,246,437. This application Jul. 18, 1994, Ser. No. 276,324

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—28 **34 Claims**



1. An apparatus for cell transfection comprising:

an instrument with a housing having a wall with at least one hole therein, wherein said instrument has a distal portion adjacent said hole and a proximal portion remote from said hole;

a heater operatively connected to said distal portion so as to apply a sufficient amount of heat to cells of a patient in vivo to enhance the cells susceptibility to transfection; and

a source of treatment agent including a DNA plasmid operatively connected to the instrument so as to apply treatment agent to the heated cells by way of a treatment channel inside said instrument and extending to said hole; and

wherein the treatment agent is operable to transfect the heated cells.

5,586,983

BONE CLAMP OF SHAPE MEMORY MATERIAL

Albert E. Sanders, 7107 Brookside La., San Antonio, and James O. Sanders, 530 Grandview Pl., Terrell Hills, both of Tex. 78209

Division of Ser. No. 956,673, Oct. 5, 1992, Pat. No. 5,290,289, which is a continuation-in-part of Ser. No. 526,601, May 22, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 189,192

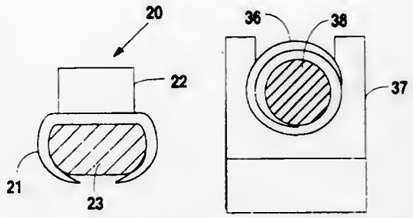
Int. Cl.[6] A61B *17/70*

U.S. Cl. 606—61 **7 Claims**

1. A clamp for securing a rod adjacent to a bone, comprising:

means for holding said rod, said means for holding constructed of shape memory material;

means for affixing said means for holding adjacent to the bone, said means for affixing connected to said means for holding and constructed of shape memory material; and



means for securing said rod within said means for holding, wherein said means for securing is constructed of shape memory material and allows slidable motion of said rod within said means for holding.

5,586,984

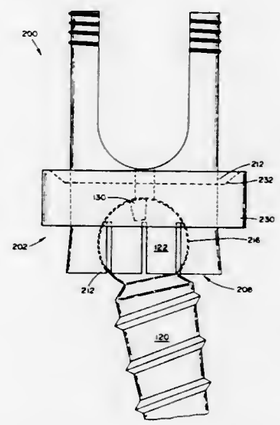
POLYAXIAL LOCKING SCREW AND COUPLING ELEMENT ASSEMBLY FOR USE WITH ROD FIXATION APPARATUS

Joseph P. Errico, Hempstead, N.Y.; Thomas J. Errico, Summit, and James D. Ralph, Oakland, both of N.J., assignors to Fastenetix, L.L.C., Summit, N.J.

Continuation-in-part of Ser. No. 502,285, Jul. 13, 1995. This application Jul. 14, 1995, Ser. No. 502,803

Int. Cl.[6] A61B *17/70*

U.S. Cl. 606—61 **28 Claims**



1. A polyaxial screw and coupling element assembly for use with orthopedic rod implantation apparatus, comprising:

a screw having a curvate head;

a coupling element including

an expandable and contractable interior chamber for receiving therein said curvate head,

a rod receiving locus for receiving therein a rod, and

a surface threading disposed on an upper exterior portion thereof;

a locking ring mounted around said coupling element, the downward translation of said ring providing a force which causes said interior chamber to contract, therein locking the screw to the coupling element; and

a top locking nut, mateable with said surface threading.

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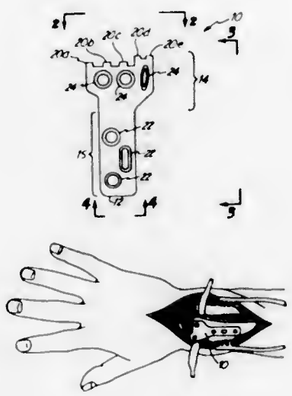
5,586,985

METHOD AND APPARATUS FOR FIXATION OF DISTAL RADIUS FRACTURES

Matthew D. Putnam, Minneapolis, and David Gesensway, Mendota Heights, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 26, 1994, Ser. No. 329,444
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—69 **22 Claims**



1. A plate for stable fixation of distal radius fractures comprising:

a) an elongated plate adapted for attachment to the dorsal surface of the radius, the plate having a proximal end and a distal end, wherein the distal end comprises first and second substantially planar surfaces, the first and second surfaces forming an included angle adapted to substantially match the curvature of the dorsal surface of the distal end of the radius, and further wherein the proximal end of the plate is curved such that the proximal end is adapted to substantially match the profile of the near distal portion of the radius;

b) a plurality of tines extending from the distal end of the plate, wherein each tine is completely integral and unitary with the plate, and further wherein each tine is oriented substantially normal to the first surface such that when the plate is located on a radius, each of the plurality of tines is adapted to extend into the radius; and

c) a plurality of openings extending through the plate adapted to receive fasteners to fasten the plate to the radius.

5,586,986

INSTRUMENT FOR CLOSING TROCAR PUNCTURE WOUNDS

Peter W. J. Hinchliffe, New Haven, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 91,793, Jul. 14, 1993. This application Feb. 23, 1995, Ser. No. 393,541
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—147 **18 Claims**

1. A surgical instrument for applying sutures, which comprises:

a) a shaft;

b) a needle carrier connected to a distal end portion of said shaft;

c) a needle having a tapered end portion and a base portion, said base portion disposed in said needle carrier such that at least said needle base portion is spaced a fixed predetermined distance from a central longitudinal axis of said instrument; and

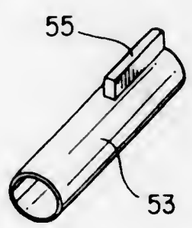
d) an elongated housing member surrounding said shaft and being longitudinally slidable thereon to a distally extended position, wherein said needle is at least partially enclosed within said elongated housing member by said elongated housing member moving from said tapered end portion toward said base portion such that said tapered end portion is shielded from body tissue by said elongated housing member, and to a proximally extended position, wherein said needle tapered end portion is exposed to such body tissue.

5,586,987

ANASTOMOSIS CUFF

Gregory M. Fahy, Gaithersburg, Md., assignor to Organ, Inc., and Life Resuscitation Technologies, Inc., both of Chicago, Ill.

Filed Mar. 24, 1995, Ser. No. 409,705
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—155 **20 Claims**



1. A cuff suitable for use in an anastomosis procedure, comprising:

a hollow portion having a length extending in a longitudinal axial direction of the cuff and a continuous inner surface; and

a non-annular outwardly extending ridge directly connected on an exterior wall of the hollow portion, the non-annular outwardly extending ridge having a planar portion that extends along the exterior wall of the hollow portion in a direction parallel to the longitudinal axial direction such that the ridge is graspable to immobilize and position the cuff.

5,586,988

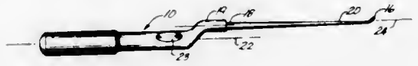
Patent Not Issued For This Number

5,586,989

MICROSURGICAL CURETTE

Robert Bray, Jr., 17724 Camino de Yatasto, Pacific Palisades, Calif. 90272

Filed Jan. 27, 1995, Ser. No. 379,738
Int. Cl.[6] A61B *17/22*
U.S. Cl. 606—160 **9 Claims**



1. A curette comprising:

a cylindrical handle having a longitudinal axis;

a shaft, having a longitudinal axis;

means or attaching a first end of the shaft to the cylindrical handle, such that the longitudinal axis of the shaft is parallel to, but not collinear with, the longitudinal axis of the cylindrical handle; and

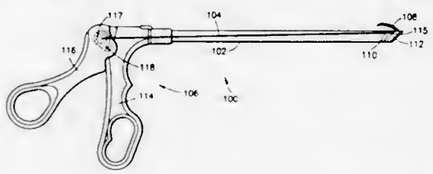
a tip included in a second end of the shaft.

5,586,990

ENDOSURGICAL INSTRUMENT WITH A RADIALLY MOVABLE END EFFECTOR

Kevin F. Hahnen, Miami; Laszlo Farkas, Hialeah, both of Fla., and David P. Gordon, Stamford, Conn., assignors to Symbiosis Corporation, Miami, Fla.

Filed May 8, 1995, Ser. No. 436,121
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—170 **20 Claims**



1. An endosurgical instrument, comprising:

a) a hollow tube having a proximal end, and a distal end, and a wall defining a radial opening near said distal end;

b) a push rod having a proximal end and a distal end, said push rod extending at least partially through said hollow tube;

c) a deflecting surface inside said hollow tube and near said distal end of said hollow tube;

d) a non-rotatable end effector coupled to said push rod with said end effector extending at least partially outside said tube and coupled to said push rod through said radial opening when said end effector is in a deployed position; and

e) actuation means coupled to said proximal end of said hollow tube and said proximal end of said push rod for effecting a relative axial movement of said tube and push rod, wherein

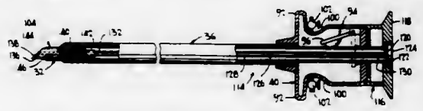
relative axial movement of said tube and push rod causes said distal end of said push rod and said deflecting surface to engage such that said end effector is moved radially and distally relative to said tube.

5,586,991

SAFETY PENETRATING INSTRUMENT

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Division of Ser. No. 745,071, Aug. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 628,899, Dec. 18, 1990, Pat. No. 5,226,426. This application Jan. 6, 1994, Ser. No. 178,151
The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.
Int. Cl.[6] A61B *5/20*
U.S. Cl. 606—185 **14 Claims**



1. A safety penetrating instrument comprising

an elongate penetrating member having a proximal end and a distal end having a sharp tip for penetrating tissue;

a safety probe including a protective body disposed adjacent said distal end of said penetrating member and having an extended position with at least a portion of said protective body protruding distally of said sharp tip and a retracted position with said body disposed to expose said sharp tip, said protective body being made of a flexible, pliable material allowing contact with tissue within the body without injury to the tissue, said protective body being resilient to permit said protective body to be moved to said retracted position in response to forces from contact of said protective body with tissue and to permit said protective body to resiliently return to said extended position upon removal of the forces from tissue contact, said protective body having a portion configured to be compressed in said retracted position and to be expanded in said extended position, said protective body portion having an accordion-like, folded configuration;

a hub receiving said proximal end of said penetrating member;

a housing abutting said hub; and

an elongate, tubular portal sleeve surrounding said penetrating member and having a distal end disposed adjacent said penetrating member distal end and a proximal end secured to said housing.

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5,586,992

DYEING CELLULOSE-CONTAINING TEXTILE MATERIAL WITH HYDROGENATED INDIGO

Georg Schnitzer, Weisenheim; Franz Suetsch, Roedersheim-Gronau; Michael Schmitt, Worms; Erich Kromm, Weisenheim; Harald Schlueter, Weisenheim; Rudolf Krueger, Weisenheim, and Andreas Weiper-Idelmann, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/00873, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/23114, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 21, 1994, Ser. No. 525,655

Claims priority, application Germany, Mar. 30, 1993, 43 10 122.4; May 12, 1993, 43 15 873.0

Int. Cl.[6] D06P *1/22;5/20*

U.S. Cl. 8—653 **7 Claims**

1. A process for dyeing cellulose-containing textile material with indigo which comprises

a) introducing into a dyebath an aqueous solution of leuco indigo prepared by catalytic hydrogenation;

b) contacting the textile material with the dyebath; and, after the leuco indigo has gone onto the textile material,

c) converting said leuco indigo back into the pigment form in a conventional manner by air oxidation.

5,586,993

SEALED STORAGE BATTERY AND MANUFACTURING METHOD THEREOF

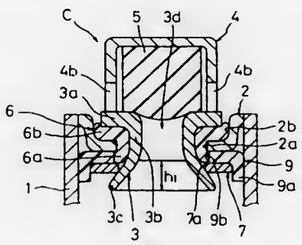
Ken Saito; Naoyoshi Hinotsu; Hikaru Sakamoto, and Koichi Hoshino, all of Iwaki, Japan, assignors to Furukawa Denchi Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 1, 1995, Ser. No. 456,564

Claims priority, application Japan, Jun. 3, 1994, 6-121641

Int. Cl.[6] H01M *6/00*

U.S. Cl. 29—623.2 **4 Claims**



1. A method for manufacturing a sealed storage battery in which a sealing assembly of said battery is assembled, the improvement wherein said assembling of said sealing assembly includes the steps of:

fitting an annular plate cover to a hollow shaft of a hollow rivet via an insulating gasket;

inserting a conical tip end portion of a punch into a bore of said hollow shaft from a side of said bore away from a head of said hollow rivet, said inserting step including a sub-step of inserting a positioning center shaft provided at a tip end of the conical tip end portion of said punch into the bore of said hollow shaft; and

pressurizing said punch toward the head of said hollow rivet, to cause an end portion of said hollow rivet on a side away from the head of said hollow rivet to be diametrically enlarged and caulked by the conical tip end portion of said punch, whereby said hollow rivet is fixed to said cover plate via said insulating gasket.

5,586,994

METHOD FOR MANUFACTURE OF A LEAD ACID STORAGE BATTERY

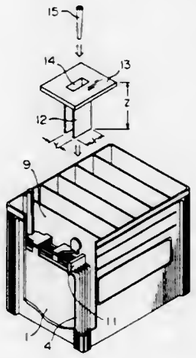
Toshirou Hasegawa, Toyohashi; Kazuhiko Shimoda, Kosai; Kunio Makino, Kosai, and Mitsuo Tomioka, Kosai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 441,129, May 15, 1995. This application Nov. 22, 1995, Ser. No. 561,068

Claims priority, application Japan, May 24, 1994, 6-109628; May 24, 1994, 6-109665; Aug. 2, 1994, 6-181257; Apr. 14, 1995, 7-089290

Int. Cl.[6] H01M *10/14*

U.S. Cl. 29—623.5 **10 Claims**



1. A method for making a lead acid storage battery which comprises the steps of:

(a) forming a plurality of plate groups, with each plate group being formed by

alternately arranging a plurality of positive plates and a plurality of negative plates, each plate having lower and upper ends and a lug disposed on the upper end,

enveloping each of the positive plates or each of the negative plates in an envelope separator having an upper portion extending to a position higher than the upper end of the plate, and

integrally connecting all of the positive plates together with a first connecting strap and integrally connecting all of the negative plates together with a second connecting strap;

(b) placing the plate groups in a plurality of cell chambers formed in a case by a plurality of inner partition walls, the case being made of a synthetic thermoplastic resin;

(c) inserting two shape regulating plates having a width the same as or narrower than an interval between opposing inner partition walls into an area above the plate group in one of the cell chambers, the shape regulating plates being disposed in the area above the plate group at a right angle to the direction of the thickness of the plate group and forming a space between the shape regulating plates;

(d) pouring a heat molten insulating resin into the space between the shape regulating plates to form a beam of resin with first and second ends and crossing the plate group in the direction of the thickness of the plate group, with the first end of the beam contacting an inner wall of the case or one of the inner partition walls, and the second end of the beam contacting one of the inner partition walls; and

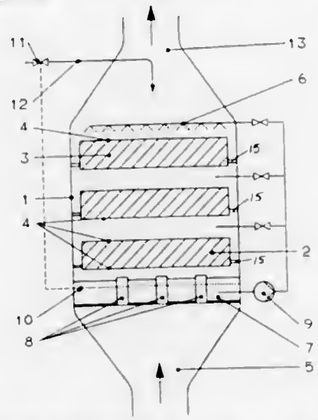
(e) curing the molten resin by cooling to form a beam-shaped plate fixing member.

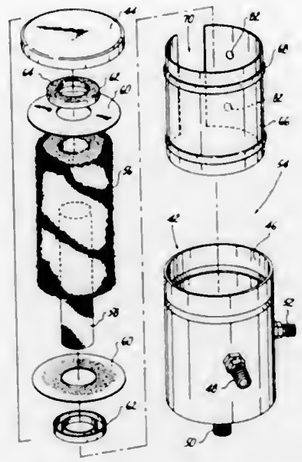
VOL 1193 ISS 4 DE 24 1996 UMI

5,586,995
FILTER FOR SEPARATING POLLUTANTS FROM FLUE GASES

Frohmut Vollhardt, Oberhausen, and Jürgen R. Heering, Knrschenbroich, both of Germany, assignors to Man Gutehoffnungshutte Aktiengesellschaft, Oberhausen, Germany

Filed Mar. 7, 1995, Ser. No. 399,751
Claims priority, application Germany, Mar. 30, 1994, 44 11 078.2
Int. Cl.[6] B01D 47/14
U.S. Cl. 55—227 12 Claims





1. A flue gas filter for separating pollutants from the flue gases, comprising: a filter housing; a plurality of filter boxes, each filter box being arranged at a spaced location from another filter box and being disposed one of horizontally one on top of another or vertically one next to another, said filter boxes being positioned within said filter housing, said filter boxes including cage-wall means for defining walls which are permeable to gas and water; filter medium selected from the group consisting of activated carbon, open-hearth furnace coke and carbonaceous material, said cage wall means retaining said filter medium within said filter boxes; water distribution means for providing a metered charging of water into said housing, said water distribution means including nozzles for spraying said filter medium in said filter boxes, said nozzles being arranged one of above each filter box, for horizontally arranged filter boxes, and to a side of each filter box, for vertically arranged filter boxes; a water collection tank, positioned below said filter boxes, for collecting water; pump means connected to said collection tank for pumping collected water and feeding water to said nozzles of said distribution means; a flue gas feed pipe connection arranged at the bottom of said filter housing; vertical gas flow pipes extending through said water collection tank for passage of flue gases from said flue gas feed pipe, past said water collection tank; and a flue gas exhaust pipe arranged at a top of said filter housing.

5,586,996
VAPOR SEPARATING DEVICE

Arman K. Manooklan, Jr., 2875 Terrell Ave., Oceanside, N.Y. 11572-1151

Filed May 12, 1994, Ser. No. 241,600
Int. Cl.[6] B01D 19/00
U.S. Cl. 55—321 9 Claims

1. Apparatus for separating oil from the blow-by exhaust vapors of a combustion engine comprising a canister having an inlet port for the intake of said vapors from the engine, a gas outlet port for connection to a source of suction for causing the vapors to be sucked through said canister from said inlet port, a discharge port for removal of condensed oil from said canister, and a hollow, cylindrical filter stack located in said canister and operatively arranged so that the vapors pass in contact and radially through the filter stack being sucked from the inlet to the gas outlet port, said filter stack comprising a filter body formed of material permeable to gas and impermeable to oil, a sleeve partially surrounding said filter body on which said vapors from said inlet port impinge and on which the oil in said vapors condense and a longitudinal opening diametrically opposite to the inlet port, and including a pair of seal caps secured to opposite ends of said canister, and an end closure compressed against said seal cap to provide an airtight seal at both ends of said canister comprising a pair of annular disks having a diameter greater than the diameter of said filter body, each of said disks being interposed between said filter body and a respective one of filter stack material ends such that said core extends through said disks, and retaining means securing said sleeve about said annular disks and in spaced enveloping relation to said filter body, said filter stack being mounted within said canister and spaced from the interior wall surface thereof to define an annular flow passage between said sleeve and the interior wall surface of said canister in which said oil in said vapors may collect prior to passage through said filter body.

5,586,997
BAG FILTER

David B. Pall, Roslyn Estates, and James T. Connors, Jr., Groton, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

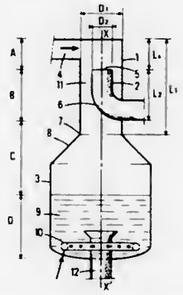
Continuation-in-part of Ser. No. 281,772, Jul. 28, 1994. This application Feb. 16, 1995, Ser. No. 389,264
Int. Cl.[6] B01D 46/02
U.S. Cl. 55—361 29 Claims

1. A bag filter comprising a melt-blown fibrous nonwoven web formed into a bag configuration with a closed end, an open end, an inside surface, and an outside surface, wherein said fibrous nonwoven web comprises fibers such that 90% of the fibers have a diameter ranging from a minimum fiber diameter to a maximum fiber diameter which is no more than about three times the minimum fiber diameter.

5,586,998
CO-CURRENT CYCLONE SEPARATION EXTRACTOR

Thierry Gauthier, Saint Genis Laval, France, assignor to Institut Francais Du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 985,712, Dec. 4, 1992, abandoned. This application Jan. 17, 1995, Ser. No. 373,535
Claims priority, application France, Dec. 5, 1991, 91 15063
Int. Cl.[6] B01D 53/24
U.S. Cl. 55—391 23 Claims



1. Cocurrent cyclone separator extractor for both the separation of a gas/solid mixture MA, having at least one dense phase DA and a light phase LA, into at least one dense phase and into at least one light phase, and for the extraction of gases sorbed by the solid, said separator extractor comprising:

a first external enclosure (1), which is elongated along an axis (X), which has a substantially circular cross-section, of internal diameter D_1 and length L_1, having at a first end, external inlet means (4) for the introduction of the mixture MA, said means making it possible to give at least to the light phase LA a helical movement in the flow direction of the mixture MA in said enclosure,

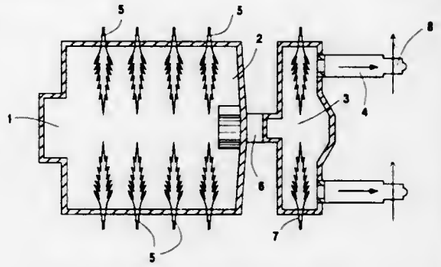
an internal enclosure (2), which is elongated along the axis (X), which has a substantially circular cross-section of diameter D_2, which is less than D_1, and of length L_2, which is less than L_1, whose and close to inlet means (4) is located at a distance LS, which is less than L_1, from the extreme level of inlet means (4), and constitutes the internal inlet (5) by which penetrates at least part of the light phase LA, said internal enclosure being extended by at least one pipe (6) permitting the discharge of the light phase LA separated outside the first external enclosure,

a second external enclosure (3) having a substantially vertical axis of symmetry, connected to said first enclosure by an opening of diameter D_1, said second enclosure collecting the separated dense phase DA and having means (10) for the injection of a light extraction phase LB, injection taking place in countercurrent manner with respect to the flow of the separated dense phase and, at least in part in said dense phase which is at least partly fluidized, the above-mentioned components arranged so that injection of light extraction phase LB limits flow of light phase LA in the direction of said second enclosure, and said second enclosure has at least one outlet (12) for the recovery of the at least partly desorbed dense phase DA, said inlet (5) also functioning as a removal means for said light extraction phase LB.

5,586,999
METHOD FOR PRODUCING GLASS WITH LOWER ALKALI CONTENT

Hisashi Kobayashi, Putnam Valley, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 894,588, Jun. 5, 1992, abandoned. This application May 16, 1994, Ser. No. 242,827
Int. Cl.[6] C03B 5/18;5/225
U.S. Cl. 65—134.3 7 Claims



1. A method for producing glass comprising:

(A) providing glass forming materials into a glassmelting zone;

(B) combusting fuel and oxidant, having an oxygen concentration exceeding that of air and at least 35 volume percent, to provide heat to the glassmelting zone and to generate sufficient combustion reaction products including carbon dioxide and water vapor to establish an atmosphere in the glassmelting zone comprising at least 30 volume percent water vapor;

(C) melting glass forming materials in the glassmelting zone by application of said heat provided to the glassmelting zone to produce molten glass;

(D) dissolving water into the molten glass to act as flux while maintaining the water vapor concentration in the glassmelting zone atmosphere at 30 volume percent or more;

(E) passing molten glass from the glassmelting zone into a refining zone and maintaining an atmosphere in the refining zone having a water vapor concentration of at least 30 volume percent;

(F) passing molten glass from the refining zone into a forehearth zone and maintaining an atmosphere in the forehearth zone having a water vapor concentration of at least 30 volume percent; and

(G) passing dry gas having less than 6 volume percent water over the molten glass and thereafter passing the molten glass to a forming machine.

5,587,000
TAKEOUT MECHANISM IN GLASSWARE FORMING MACHINE

Philip A. Mann, Pontefract, and Ian Green, Dore, both of United Kingdom, assignors to Emhart Glass Machinery Investments Inc., Wilmington, Del.

Filed Dec. 12, 1994, Ser. No. 353,843
Claims priority, application United Kingdom, Dec. 16, 1993, 9325748
Int. Cl.[6] C03B 9/44
U.S. Cl. 65—260 2 Claims

1. A method of setting up a take out mechanism in a glassware forming machine comprising a machine frame, a set of blow mould members having an upper surface and having a known invert height mounted in said machine frame, support means extending above said machine frame, and a take out mechanism comprising:

a vertically extending housing which is secured in said machine frame and which includes an upward extension secured to said support means,

a piston and cylinder device in said housing having upper and lower ends, the piston displaceable between upper and lower positions,

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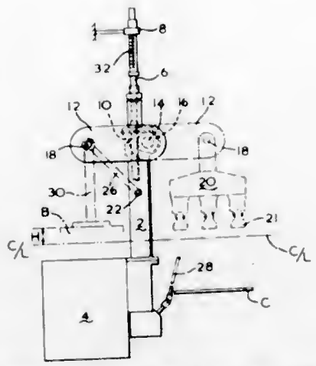


a stop at the lower end of said piston and cylinder which determines the lower position of the piston in said device,

a rack in said housing connected to said piston and cylinder device,

a take out arm pivoted on said housing and linked to said rack by gear means,

a take out head pivoted on said take out arm at a pivot point,

take out tongs depending from said take out head, the pivotal displacement of the take out arm displacing the take out tongs from a lower position for picking up formed containers to an upper position and

wherein a reference boss is provided on said housing, the method comprising

(i) positioning a first jig member between said reference boss and said pivot point to ensure said take out arm is at a predetermined angle to the housing;

(ii) adjusting said stop at the lower end of said piston and cylinder device to ensure that when said take out arm is at the predetermined angle said piston cannot move further downwards;

(iii) removing said first jig member from the pivot point of the arm and from the reference boss and replacing it with a second jig member selected for the lower position of said take out tongs, said second jig member placed on the pivot point of the arm and freely depending from said pivot point of said arm;

(iv) adjusting the position of said housing in the machine frame so that said second jig member contacts the upper surface of the set of blow mould members in the machine and fixing said housing in such position; and

(v) adjusting a scale on said upward extension so that the scale reads a value equivalent to the invert height of the mould members.

5,587,001

PROCESS FOR TREATING IRON-CONTAINING SULFIDIC ROCKS AND ORES

Nadine H. C. De Vries, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 28, 1995, Ser. No. 431,215

Int. Cl.[6] C22B *3/06;3/12*

U.S. Cl. 75—743 **8 Claims**

1. A process for pretreating sulfidic iron-containing ores of metals prior to lixiviating said ores comprising the steps of:

A. contacting said ores with an aqueous solution containing manganate ions or a precursor of manganate ions wherein the concentration of manganate ions, present or formed, is between approximately 0.0005 mole % and saturation, and the pH of the solution is between about 6 and 13;

B. allowing a reaction between said precursor moiety and the sulfides in said ore to proceed when the solution of step A contains a manganate precursor so as to form manganate ions; and

C. maintaining the pH of the reaction medium at between about 6 and 13 so as to cause the formation of a layer of manganese oxide on the surface of said sulfides.

5,587,002

PROCESS FOR THE PREPARATION OF A COOLING AGENT CONTAINING IRON FOR A STEEL-MAKING CONVERTER

Serge Audebert, Bellegarde, and Francis Audibert, Saint Martin de Crau, both of France, assignors to Sollac, Puteaux, France

Filed Nov. 25, 1992, Ser. No. 981,425

Claims priority, application France, Nov. 26, 1991, 91 14590

Int. Cl.[6] C22B *1/243;1/244*

U.S. Cl. 75—770 **8 Claims**

1. A process for the preparation of a cooling agent containing iron, comprising the steps of:

adding quicklime, iron ore, slag and metal fibrils to extracted fatty rolling mill slurries present in a container in order to obtain mixture A which comprises more than 5% water, hydrocarbons and contains the following components in percent by weight:

fatty slurries: 55 to 93%

lime: 5 to 25%

metal fibrils: 5 to 15%

iron ore: 1 to 15%

slag: 1 to 15%

covering said container containing mixture A and allowing mixture A to stand for a time sufficient for slaking of said lime, reduction of the water content to 4–5% and reduction of the hydrocarbon content,

homogenizing mixture A,

adding 4 to 10% of binder to said mixture A to produce mixture B,

compacting said mixture B in order to form ovoids.

5,587,003

REMOVAL OF CARBON DIOXIDE FROM GAS STREAMS

Martin Bülow, Basking Ridge; Loc Dao, Bound Brook, and Frank R. Fitch, Bedminster, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Mar. 21, 1995, Ser. No. 407,817

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—123 **13 Claims**

1. A method of removing carbon dioxide from a gas stream selected from oxygen, nitrogen, argon and mixtures of these which contains carbon dioxide at a partial pressure not greater than about 10 mbar as an impurity, comprising subjecting said gas stream to adsorption using clinoptilolite as the adsorbent at a temperature in the range of about 20° to about 80° C., thereby adsorbing substantially all of the carbon dioxide from the gas stream.

5,587,004

DEFOAMING DEVICE AND METHOD FOR AERATION

Fumio Mogi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 716,466, Jun. 17, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 487,514

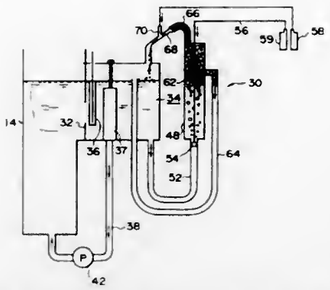
Claims priority, application Japan, Jun. 22, 1990, 2-165367

Int. Cl.[6] B01D *19/02*

U.S. Cl. 95—157 **20 Claims**

1. A defoaming device for aeration, for use in a processor equipped with an aeration apparatus for sending air into a processing solution, comprising:

a pipe for guiding foam produced in said aeration apparatus to outside said aeration apparatus;



a throttle portion disposed midway in said pipe and formed by reducing the cross-sectional area of said pipe so as to accelerate the flow rate of the foam in said pipe, portions of said pipe at an upstream side of said throttle portion being isolated from ambient;

air-stream guiding means co-acting with said throttle portion for guiding an air stream into a portion of said pipe in a downstream direction corresponding to the direction of the flow of the foam so as to accelerate the flow rate of the foam in said pipe up to a predetermined rate, said air-stream guiding means being disposed at the downstream side of said throttle portion, said pipe having no throttle portions downstream of said air-stream guiding means.

11. A defoaming method for use in a processor equipped with an aeration apparatus for sending air into a processing solution, said method comprising:

guiding foam produced in said aeration apparatus through a pipe to an outside apparatus;

increasing a flow rate of the foam in said pipe by providing a throttle portion midway in said pipe and by providing means for guiding an air stream into a portion of said pipe downstream of said throttle portion of said pipe in a direction corresponding to a direction of flow for the foam, said pipe having no throttle portions downstream of said air stream guiding means and portions of said pipe at an upstream side of said throttle portion being isolated from ambient.

5,587,005

AIR PURIFIER APPARATUS WITH AN ELECTROSTATIC FILTER

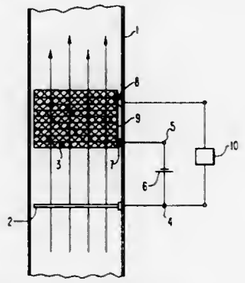
Doreano De Marco, Belluno, Italy, assignor to Procond Elettronica S.p.A., Belluno, Italy

Filed Mar. 7, 1995, Ser. No. 399,553

Claims priority, application Italy, Mar. 16, 1994, PN94A0015

Int. Cl.[6] B03C *3/72*

U.S. Cl. 96—26 **4 Claims**



1. An air purifier apparatus comprising:

a power supply;

a first electrode connected to a first terminal of said power supply;

an electrical contact connected to a second terminal of said power supply;

an electrostatic filter detachably and operatively connected to said electrical contact;

an alarm device having at least first and second indicator states, said alarm device having said first indicator state when said electrostatic filter is electrically connected to said power supply through said electrical contact, and said alarm device having said second indicator state when said electrostatic filter is not electrically connected to said power supply through said electrical contact; and

a second electrical contact which is connected to said alarm device, wherein said electrostatic filter is detachably and operatively connectable to said second electrical contact, and wherein said electrical contact and said second electrical contact are electrically connected through said electrostatic filter when said electrostatic filter is operatively connected to said electrical contact and said second electrical contact;

wherein said alarm device includes means for changing from said second indicator state to said first indicator state when energized by said power supply through said electrostatic filter and said second electrical contact;

wherein said alarm device includes a display indicator and an electrostatically controlled shutter, said electrostatically controlled shutter concealing said display indicator in the absence of energy from said power supply and revealing said display indicator when energized by said power supply.

5,587,006

COMPOSITION AND PROCESS FOR MECHANICAL PLATING OF NICKEL-CONTAINING COATINGS ON METAL SUBSTRATES

Marjorie H. Shepherd, Madison, Ind., and Kim B. Gasaway, Troy, Ohio, assignors to Madison Chemical Co., Inc., Madison, Ind.

Division of Ser. No. 336,668, Nov. 7, 1994, Pat. No. 5,460,848, which is a continuation-in-part of Ser. No. 224,520, Apr. 7, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 510,127

Int. Cl.[6] B22F *7/00*

U.S. Cl. 106—1.05 **9 Claims**

1. A co-plating promoter composition for mechanically plating a tin- and nickel-containing coating on metal articles, said composition comprising from 1 to 30 wt-% insoluble nickel oxide, from 5 to 50 wt-% platable tin compound, from 10 to 45 wt-% acidity regulating agent and from 10 to 60 wt-% dispersant.

5,587,007

MODIFIED DICYCLOPENTADIENE RESINS

Daniel R. Curvin, Franklin, Va., assignor to Arizona Chemical Company, Panama City, Fla.

Filed Aug. 14, 1995, Ser. No. 514,764

Int. Cl.[6] C09D *11/00;* **C08G** *63/00*

U.S. Cl. 106—23 **25 Claims**

1. A method for preparing a modified dicyclopentadiene resin consisting essentially of

reacting (a) dicyclopentadiene, (b) a phenol selected from the group consisting of an alkyl phenol having the formula $CH_3C_nCH_{2n}C_6H_4OH$, where n is from 1 to 9, and a bisphenol having the formula $HOC_6H_4(CR_2)_xC_6H_4OH$, where R is independently hydrogen or a C_1–C_6 alkyl group and x is from 1 to 4, or mixtures thereof; (c) a fatty acid or a derivative thereof selected from the group consisting of tall oil, a tall oil derivative, dimer fatty acid, linseed oil and mixtures thereof; and (d) an unsaturated organic diacid or an anhydride thereof, at a temperature and pressure sufficient to produce a phenol-modified cyclopentadiene resin.

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5,587,008

SAND MOLDING MEDIA FOR IRON CASTINGS

Victor S. LaFay, Cincinnati, Ohio, and Stephen L. Neltner, Alexandria, Ky., assignors to Hill & Griffith Co., Cincinnati, Ohio

Filed Nov. 7, 1995, Ser. No. 556,740
Int. Cl.[6] B22C *1/02*
U.S. Cl. 106—38.51 **10 Claims**

1. A sand molding medium comprising, on a weight basis:

silica sand	85%–95%
pre-mix	5%–15%

wherein the pre-mix comprises:

a clay component	70%–80%
a carbon component	15%–30%

characterized in that
the carbon component includes wettable uintaite.

5,587,009

ADHESIVE RELEASE AGENT APPLIED TO SURFACE FOR IMPROVED CLEANING

Michael E. Besse, Golden Valley; Cynthia L. Ross, Roseville, and Helen A. Kleaver, Prior Lake, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Jun. 12, 1995, Ser. No. 489,692
Int. Cl.[6] B29C *33/60*
U.S. Cl. 106—244 **11 Claims**

1. A method for removing bonding agents from a substrate, said method comprising the steps of:

(a) applying a release composition to a substrate to form a barrier layer, said release composition comprising an effective adhesive bond releasing amount of lecithin and an amount of hydrophobic carrier effective to provide a barrier layer when said composition is applied on the intended substrate;

(b) contacting the treated substrate with a bonding agent; and

(c) removing any bonding agent from the areas of the substrate treated with the release agent, wherein the hydrophobic carrier is selected from the group consisting of an animal-based oil, a vegetable oil, a mineral oil, and mixtures thereof.

5,587,010

PROCESS FOR PRODUCING FINE FLAKY ALUMINA PARTICLES AND ALUMINA-BASED PLASTIC MATERIAL

Yasun Shibasaki, Nagoya; Kiichi Oda, Nagoya, and Takeshi Fukuda, Kurobe, all of Japan, assignors to Agency Of Industrial Science And Technology, Ministry Of International Trade And Industry, and YKK Corporation, both of Tokyo, Japan

Division of Ser. No. 301,734, Sep. 7, 1994, which is a continuation of Ser. No. 907,933, Jul. 1, 1992, abandoned. This application Jun. 16, 1995, Ser. No. 491,114
Claims priority, application Japan, Jul. 9, 1991, 3-193668; Oct. 3, 1991, 3-282015
Int. Cl.[6] C04B *35/10*
U.S. Cl. 106—287.17 **4 Claims**

1. An alumina-based plastic material produced by kneading an

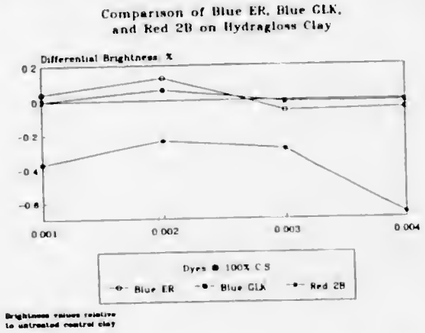
alumina powder consisting of fine flaky alumina particles having a particle size of 1.0 μm or less and a thickness of 0.1 μm or less with an organic water holding material and water.

5,587,011

OPTICALLY WHITENED CLAY PIGMENTS

Carl J. Marshall, Jr., and Gary M. Freeman, both of Macon, Ga., assignors to J. M. Huber Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 382,938, Feb. 1, 1995, abandoned, which is a continuation of Ser. No. 102,312, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 844,318, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 665,824, Mar. 7, 1991, abandoned, which is a division of Ser. No. 427,341, Oct. 27, 1989, abandoned. This application Apr. 6, 1995, Ser. No. 419,069
Int. Cl.[6] C04B *14/00*
U.S. Cl. 106—416 **33 Claims**



1. A method of optically whitening an inorganic pigment selected from a mineral clay pigment and a sodium aluminosilicate pigment, each pigment having a yellow tint, without sacrificing the pigment's brightness, comprising adding to an aqueous slurry of the pigment, an aqueous solution in combination comprising (1) a blue cationic organic dye that is either bright blue or reddish-blue in hue with (2) a red cationic organic dye that is bluish-red in hue, the ratio of the (1) blue to the (2) red dye being from 99/1 to 60/40 at an effective combined concentration of 0.00002 to 0.008% by weight as based on active dyestuffs on dry pigment, and vigorously mixing the resulting slurry to bond the dyes directly to the pigment, whereby the pigment exhibits increased whiteness.

5,587,012

COMPOSITION FOR AND METHOD OF PUMPING CONCRETE

Daniel P. Montgomery, Mesquite, Tex., assignor to Fritz Industries, Inc., Mesquite, Tex.

Division of Ser. No. 282,879, Jul. 29, 1994, Pat. No. 5,443,636. This application Jun. 22, 1995, Ser. No. 493,411
Int. Cl.[6] C04B *24/10*
U.S. Cl. 106—823 **10 Claims**

1. An additive for a concrete slurry said additive being comprised of a water soluble, inorganic, alkaline material and a solvatable, organic polymeric material,

wherein the concentration of said alkaline material in said additive is an amount in the range of from about 40 to about 99 parts per 100 parts by weight of said additive and the concentration of said polymeric material in said additive is an amount in the range of from about 1 to about 60 parts per 100 parts by weight of said additive, and further

wherein said organic polymeric material consists essentially of a mixture of at least one synthetic hydrophilic polymer and a material selected from the group consisting of natural polymers modified by reaction with hydrophilic constituents and mixtures thereof, and still further

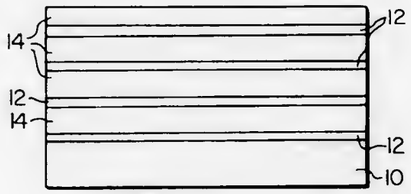
wherein the weight ratio of said synthetic hydrophilic polymer to said modified natural polymer is an amount in the range of from about 1 to 1 to about 2 to 1 and the molecular weight of said modified natural polymer is less than about 100,000.

5,587,013

METHODS OF SYNTHESIZING AND POLISHING A FLAT DIAMOND FILM AND FREE-STANDING DIAMOND FILM

Akihiko Ikegaya; Keiichiro Tanabe, and Naoji Fujimori, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 27, 1995, Ser. No. 379,692
Claims priority, application Japan, Jan. 27, 1994, 6-26353
Int. Cl.[6] C30B *29/04*
U.S. Cl. 117—89 **32 Claims**



1. A method of synthesizing a free-standing diamond film comprising the steps off:

growing at least one potential-convex diamond layer on a substrate by a CVD method using hydrogen gas and hydrocarbon gas under a condition (a) such that the at least one potential-convex diamond layer has a potential to deform into a convex shape by elimination of the substrate;

growing at least one potential-concave diamond layer on the potential-convex diamond layer by a CVD method under a condition (b) such that the at least one potential-concave diamond layer has a potential to deform into a concave shape by elimination the substrate;

alternating said growing steps such that the potential-convex and potential-concave diamond layers alternate;

eliminating the substrate; and

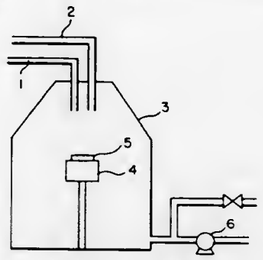
obtaining the free-standing diamond film having at least one potential-convex layer and at least one potential-concave layer, the potential-convex and potential concave layers being deposited alternately.

5,587,014

METHOD FOR MANUFACTURING GROUP III-V COMPOUND SEMICONDUCTOR CRYSTALS

Yasushi Iyechika, and Tomoyuki Takada, both of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 21, 1994, Ser. No. 360,427
Claims priority, application Japan, Dec. 22, 1993, 5-325333
Int. Cl.[6] G30B *25/14*
U.S. Cl. 117—90 **10 Claims**



1. A method for manufacturing group III–V compound semiconductor crystals including at least Ga as the group III element and at least N as the group V element by using metal-organic compounds of a group III metal having at least Ga in the molecule thereof and compounds having N in the molecule thereof as the raw materials, to grow a group III–V compound semiconductor crystal in a reaction tube and grow the crystal on a substrate made of a material different from the group III–V compound semiconductor crystal to be grown;

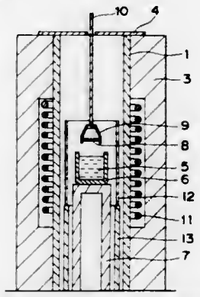
wherein at least one kind of gas, selected from a group consisting of compounds including halogen elements and group V elements, and hydrogen halide, is introduced before the growth of the compound semiconductor crystal begins thereby to carry out gas phase etching of the inner wall surface of the reaction tube.

5,587,015

APPARATUS FOR PRODUCTION OF SINGLE CRYSTAL OXIDE FILMS BY LIQUID-PHASE EPITAXY

Masaru Fujino, and Hiroshi Takagi, both of Ohtsu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 6, 1995, Ser. No. 418,012
Claims priority, application Japan, Apr. 7, 1994, 6-069402
Int. Cl.[6] C30B *35/00*
U.S. Cl. 117—200 **15 Claims**



1. An apparatus for production of single crystal oxide films by liquid-phase epitaxy comprising an insulating core tube, an electroconductive cylindrical member having openings at both ends and being arranged in the core tube, a high frequency induction heater disposed outside said core tube for heating said electroconductive cylindrical member and a crucible made of an electroconductive material and coaxially arranged in the cylindrical member.

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5,587,016

CONTROLLED FEEDING CZOCHRALSKI APPARATUS

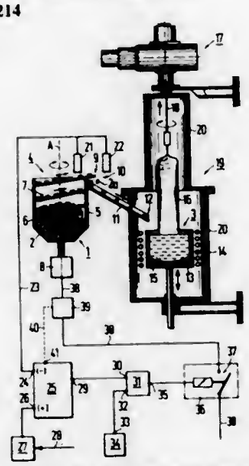
Burkhard Altekrüger; Joachim Aufrelter, both of Alzenau; Dieter Brüss, Bruchköbel, and Klaus Kalkowski, Kelkheim, all of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Division of Ser. No. 293,428, Aug. 19, 1994, Pat. No. 5,492,078. This application Nov. 13, 1995, Ser. No. 556,048

Claims priority, application Germany, Aug. 28, 1993, 43 28 982.7

Int. Cl.[6] C30B *35/00*

U.S. Cl. 117—214 **8 Claims**



1. A control system for the controlled feeding of a melting crucible (13) with particles (2, 2*a*) during the drawing of a crystal (16) by the Czochralski method, said system comprising a source (1) for a supply of particles (2, 2*a*) and with a melting crucible (13) to receive the particles, where the source (1) is equipped with a conveying device (4) for discharging particles at an adjustable rate per unit time, and where a device (17) for he continuous drawing-out of a crystal (16) with a given diameter and a given dopant concentration is attached to the melting crucible (13), means (7, 11) for putting the doped particles into single file as the particles (2, 2*a*) are traveling to the melting crucible (13), at least one sensor (21, 22) for counting the particles traveling in single file, wherein the output of each sensor (21, 22) is connected to a first input (24) of a counter (25), which has a second input (24) for a reference value element (27) and which can find the difference between the count pulses of the sensor (21, 22) and the reference input pulses supplied by the reference input element; and wherein the counter output (29) is connected to a control device (switching element (36) and amplifier (35)) for the drive (8) of the conveying device (4) of the source (1).

5,587,017

PROCESS AND APPARATUS FOR PRODUCING MOLTEN METAL COATED STEEL SHEETS

Shizuo Yamanaka, Chiba-ken, and Takao Hashimoto, Ibaragi-ken, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Sep. 29, 1994, Ser. No. 314,630

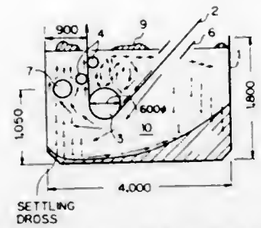
Claims priority, application Japan, Sep. 30, 1993, 5-244749

Int. Cl.[6] B05C *3/00*

U.S. Cl. 118—424 **16 Claims**

1. An apparatus for producing a molten metal plated steel sheet comprising:

a molten metal plating tank containing a melt, said plating tank having a bottom and side walls with one side wall being located at a delivery end at which a steel sheet fed through the plating tank emerges,



a submerged sink roll disposed in the plating tank for conveying the steel sheet; and

a buffer member provided within the tank between the sink roll and the one side wall for decelerating melt flows coming from below the sink roll.

5,587,018

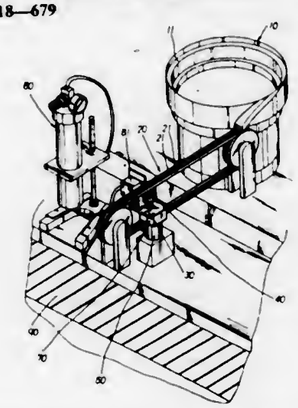
360 DEGREES FAST SPOT GLUING MACHINE FOR SCREWS

Fa-Chih Chung, Miao-Li Hsien, Taiwan, assignor to Jiuh Yih Hardware Co., Ltd., Miao-Li Hsien, Taiwan

Filed Jan. 20, 1995, Ser. No. 375,676

Int. Cl.[6] B05C *11/00;1/00;5/00*

U.S. Cl. 118—679 **4 Claims**



1. A gluing machine for applying glue around the periphery of a shank portion of a headed fastener comprising:

a) supply means for supplying a plurality of fasteners;

b) a conveyor for conveying a plurality of fasteners from the supply means, the conveyor comprising a pair of spaced apart endless belts having first runs moving at substantially the same speed so as to convey the fastener with the shank portions extending below the first runs between the spaced apart endless belts; and,

c) a glue applying device for applying glue around the entire circumference of the shank of the fastener, the glue applying device comprising:

i) a pair of spaced apart upright boards forming a channel therebetween, the boards located immediately beneath the first runs of the spaced apart endless belts such that shanks of fasteners conveyed by the endless belts pass through the channel between the upright boards;

ii) a gluing plate attached to a first of the pair of upright boards so as to extend into the channel;

iii) glue supply means connected to the gluing plate to supply glue to the gluing plate;

iv) an arcuate notch in a second of the pair of upright boards; and,

v) a rotatable wheel having a resilient peripheral surface, a portion of the wheel extending into the channel between the upright boards through the arcuate notch to contact the shanks of fasteners conveyed by the convey such that rotation of the wheel causes rotation of a fastener shank coming into contact with the wheel against the gluing pad so as to apply the glue around the entire periphery of shanks.

5,587,019

APPARATUS FOR USE IN EPITAXIAL CRYSTAL GROWTH

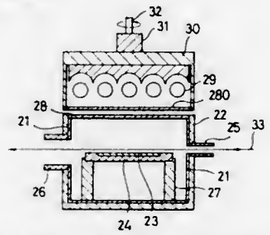
Koji Fujie, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 23, 1993, Ser. No. 47,552

Claims priority, application Japan, Feb. 26, 1992, 4-075200

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—725 **5 Claims**



1. An apparatus for epitaxially growing a semiconductor crystal, comprising:

a reactor having an inner container made of quartz, a transparent quartz window at the upper end of said reactor, a gas supply pipe for supplying a reactive gas into said reactor and an exhaust pipe for exhausting the gas remaining in the reactor, with both tubes mounted through opposite side walls of the reactor, respectively, said reactor being completely sealed except for said gas supply and exhaust pipes;

a semiconductor support member fixedly mounted in said container of said reactor for supporting a semiconductor substrate; and

a hermetically sealed infrared lamp housing rotatably mounted over said quartz window and in parallel with said quartz window, wherein said reactor and said lamp housing are completely separate from each other.

5,587,020

Patent Not Issued For This Number

5,587,021

METHOD AND APPARATUS FOR THE CLEANING AND/OR CARE OF FLOORS AND/OR FLOOR COVERINGS OF ALL TYPES

Guido Hoersch, Kapfenberger Strasse 28, D-50226 Frechen, Germany, and Reinhard Hoersch, Frechen, Germany, assignors to Guido Hoersch, Frechen, Germany

PCT No. PCT/EP93/02747, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO94/08504, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 7, 1993, Ser. No. 411,606

Claims priority, application Germany, Oct. 10, 1992, 42 33 888.3

Int. Cl.[6] B08B *3/12;5/00;* **A47L** *5/10;5/26*

U.S. Cl. 134—1 **37 Claims**

1. A method for the treatment of a surface, the surface being bare floor, a tiled floor or a floor with a covering including a carpet, upon an application of an auxiliary medium and an application of heat with a machine, wherein the machine has means for heating an air stream, at least one rotary disk and at least one drive dish with an opening through said dish for the passage of said hot air stream and at least one opening for said auxiliary medium, comprising the steps:

heating said air stream to provide a heated air stream;

pre-heating said auxiliary medium in said heated air stream to provide a pre-heated auxiliary medium;

directing said heated air stream through said drive dish;

directing said pre-heated auxiliary medium through said drive dish;

heating said pre-heated auxiliary medium with said heated air stream as said pre-heated auxiliary medium and said heated air stream pass through said drive dish.

5,587,022

METHOD OF RINSING SHOWERS

Robert H. Black, 4858 Mariner Point, Jacksonville, Fla. 32225

Division of Ser. No. 374,918, Jan. 19, 1995, abandoned, which is a continuation-in-part of Ser. No. 162,751, Dec. 7, 1993, abandoned. This application May 11, 1995, Ser. No. 439,382

Int. Cl.[6] B08B *3/04;3/08*

U.S. Cl. 134—26 **20 Claims**

1. A method of rinsing showers clean, consisting essentially of repeated cycles of the steps of:

wetting surfaces of a shower;

spraying the wet shower surfaces after showering with an aqueous rinsing solution comprising:

0.5% to 3% by volume of a non-ionic surfactant having an HLB of 13 or less;

1 to 8% by volume of an alcohol selected from the group consisting of isopropyl alcohol, ethyl alcohol, n-propyl alcohol, n-butyl alcohol, isobutyl alcohol, and glycerol; and

0.1 to 3% by volume of a chelating agent, wherein said aqueous rinsing solution has a pH in a range of 4 to 8, whereby deposits resulting from showering are removed, without scrubbing or wiping by allowing said aqueous rinsing solution to transport said deposits down the shower surfaces to a drain, said shower surfaces air-drying spot-free and without streaking.

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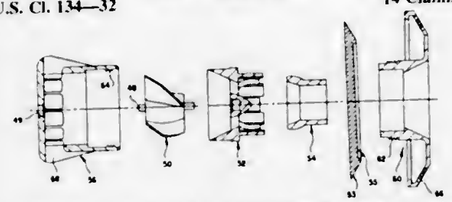
5,587,023

METHOD OF REMOVING A WHIRLPOOL JET APPARATUS FROM A WHIRLPOOL BATHTUB FOR INSPECTION, CLEANING OR REPAIR

John W. Booth, Irving, Tex., assignor to Sanijet Corporation, Dallas, Tex.

Continuation of Ser. No. 147,201, Nov. 3, 1993, Pat. No. 5,414,878. This application May 16, 1995, Ser. No. 442,548
Int. Cl.[6] B08B *7/00*
U.S. Cl. 134—32 14 Claims



1. A method of removing a jet assembly for inspection, cleaning and repair from a whirlpool jet apparatus, the apparatus comprising

a jet casing mounted in a tub aperture in a water tight manner providing an open end facing into tub interior, and

a jet assembly for receiving and pumping water being insertable and removable through said open end,

the method comprising the steps of:

disengaging the jet assembly from the jet casing without breaking a water tight seal; and

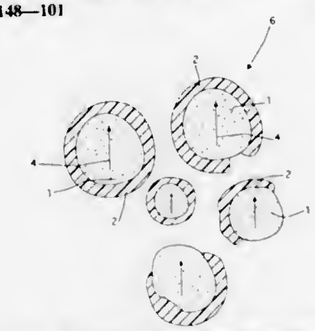
removing the jet assembly from the casing as a one piece unit.

5,587,024

SOLID RESIN-COATED MAGNET POWDER AND A METHOD FOR PRODUCING AN ANISOTROPIC BONDED MAGNET THEREFROM

Ryoji Nakayama; Takuo Takeshita, and Muneaki Watanabe, all of Saitama-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Division of Ser. No. 71,565, Jun. 1, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 423,272
Claims priority, application Japan, Jun. 1, 1992, 4-165349
Int. Cl.[6] H01F *1/03*
U.S. Cl. 148—101 4 Claims



1. A method for making a solid resin-coated magnet powder comprising:

forming an alloy ingot;

heating said alloy ingot in a hydrogen atmosphere;

continuing said heating to promote phase transformation of said alloy ingot;

maintaining said alloy ingot in a vacuum at an elevated temperature to further promote phase transformation;

grinding said ingot to produce an anisotropic powder;

dissolving a plastic resin in a solvent to produce a solution;

mixing said anisotropic powder with said solution;

kneading said anisotropic powder in said solution in a vacuum until said solvent is substantially completely volatilized;

granulating the product of said kneading step to produce a composite powder; and

ball milling said composite powder to produce a resulting product containing a substantial fraction consisting of individual magnet powder particles coated with said plastic resin.

5,587,025

NUCLEAR STEAM GENERATOR CHEMICAL CLEANING PASSIVATION SOLUTION

John M. Jevec, Uniontown, Ohio, and Randall P. Dow, Lynchburg, Va., assignors to Framatome Technologies, Inc., Lynchburg, Va., and The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 22, 1995, Ser. No. 408,670
Int. Cl.[6] C23C *22/60*
U.S. Cl. 148—274 4 Claims

1. A method for chemically passivating nuclear steam generator surfaces, comprising the steps of:

during a copper removal step after a copper removal phase when copper concentration stops increasing;

providing a free EDTA solution in an amount of less than or equal to 15 grams per liter of solution but not less than a minimum of about 1 gram per liter of solution;

raising the solution temperature to about 37° C. to 49° C.;

spiking a hydrogen peroxide concentration back to about 2±0.5% (w/v) as a passivation solution; and

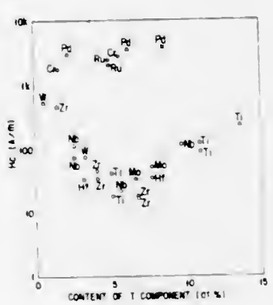
exposing the nuclear steam generator surfaces to the passivation solution for a period of at least two hours.

5,587,026

FERROMAGNETIC FILM

Hitoshi Iwasaki; Yuichi Ohsawa, and Reiko Kondoh, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 188,747, Jan. 31, 1994, Pat. No. 5,484,491, which is a continuation of Ser. No. 954,042, Sep. 30, 1992, abandoned. This application Jul. 5, 1995, Ser. No. 498,231
Claims priority, application Japan, Sep. 30, 1991, 3-250674; Sep. 30, 1991, 3-252448
Int. Cl.[6] C22C *19/07*
U.S. Cl. 148—313 9 Claims



1. A magnetic head comprising a ferromagnetic film having a coercive force of 200 A/m or less and consisting of an alloy represented by the formula:

$Co_xFe_yT_z$

wherein T is an element selected from the group consisting of Ta, Ti, Zr, Hf, Mo and W, and x, y, and z represent atomic % and satisfy:

$73<x<94$,

$5<y\leqq 15$,

$1<z<12$, and

$x+y+z=100$,

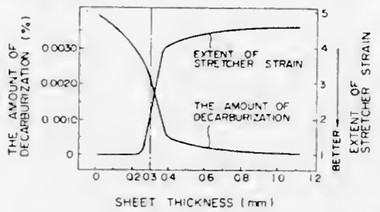
and wherein said film shows hcp-phase (001) orientation.

5,587,027

METHOD OF MANUFACTURING CANNING STEEL SHEET WITH NON-AGING PROPERTY AND SUPERIOR WORKABILITY

Akio Tosaka; Chikako Fujinaga; Toshiyuki Kato; Kaku Sato, and Hideo Kuguminato, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kyogo, Japan

Filed Feb. 15, 1995, Ser. No. 389,045
Claims priority, application Japan, Feb. 17, 1994, 6-020346
Int. Cl.[6] C22C *38/06*; C21D *8/00*
U.S. Cl. 148—320 21 Claims



1. A method for manufacturing a canning steel sheet with non-aging property and superior workability, comprising the steps of:

(a) using, as a starting material, an ultra-low-carbon steel slab consisting essentially of:

C: from 0.0015% to 0.0100% by weight,

Si: up to 0.20% by weight,

Mn: from 0.10% to 1.20% by weight,

Al: from 0.02% to 0.10% by weight,

P: from 0.005% to 0.040% by weight,

S: up to 0.015% by weight,

N: up to 0.005% by weight, and balance iron and unavoidable impurities;

(b) hot rolling said steel;

(c) pickling said steel;

(d) cold rolling said steel at a reduction ratio of at least 70% after said pickling step; and

(e) recrystallization annealing said steel in a continuous annealing furnace in an atmosphere having a hydrogen content of from 3% to less than 10% and a dew point not lower than −20° C. at a temperature not lower than 730° C. such that the content of remained C in said steel is kept less than 0.0015% by weight.

5,587,028

AMORPHOUS ALLOYS RESISTANT TO HOT CORROSION

Koji Hashimoto, 2-25-5, Shogen, Izumi-ku, Sendai-shi, Miyagi; Hiroki Habazaki, Sendai, both of Japan; Stanislaw Mrowec, and Marek Danielewski, both of Krakow, Poland, assignors to Koji Hashimoto, Miyagi, and YKK Corporation, Tokyo, both of Japan

Continuation of Ser. No. 44,534, Apr. 7, 1993, abandoned. This application Feb. 9, 1995, Ser. No. 386,121
Claims priority, application Japan, Apr. 7, 1992, 4-085529; Apr. 7, 1992, 4-085530; Nov. 11, 1992, 4-326075
Int. Cl.[6] C22C *45/08*
U.S. Cl. 148—403 5 Claims

5. A single phase amorphous alloy which is produced by sputtering and resistant to hot corrosion in both sulfidizing and oxidizing atmospheres at high temperatures, which consists of, at most, 20 atomic percent of at least one element selected from the group of Fe, Co, Ni and Cu, at most, 50 atomic percent of Si and less than 50 atomic percent of the sum of Cr and at least 7 atomic percent of at least one element selected from the group of Mo and W, with the sum of Si and the substantial balance of at least 10 atomic percent of Al being at least 30 atomic percent, said alloy having a parabolic rate constant of oxidation at 950° C. of 5×10^{-12} $g^2\ cm^{-4}\ s^{-1}$ or smaller and a parabolic rate constant of sulfidation at 950° C., under a sulfur partial pressure of 10^{-2} atm., of 9×10^{-9} $g^2\ cm^{-4}\ s^{-1}$ or smaller.

5,587,029

MACHINEABLE ALUMINUM ALLOYS CONTAINING IN AND SN AND PROCESS FOR PRODUCING THE SAME

Subhasish Sircar, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 27, 1994, Ser. No. 330,514
Int. Cl.[6] C22C *21/12*
U.S. Cl. 148—438 16 Claims

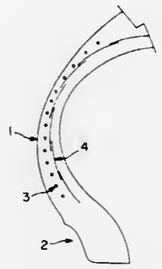
1. A lead-free free-machining aluminum alloy comprising an aluminum alloy including an effective amount of tin and an effective amount of indium, the effective amounts of tin and indium being those amounts of tin and indium that when combined with each other and with other elements in the alloy form low melting point constituents that melt during a machining operation to facilitate formation of proper size machine chips for effective machining, the amount of tin in the alloy ranging from 0.04 to 1.5 wt. %, the amount of indium being greater than 0.10 wt. %, and the alloy having copper as a major alloying element.

5,587,030

TIRE HAVING CARCASS REINFORCEMENT FORMED OF STRIPS

Yves Herbelleau, Riom, France, assignor to Sedepro, Paris, France

Filed Jun. 2, 1995, Ser. No. 458,737
Claims priority, application France, Jun. 28, 1994, 94 08304
Int. Cl.[6] B60C *9/00;9/02;9/08*
U.S. Cl. 152—555 7 Claims



1. A tire reinforced by at least one so-called carcass reinforcement present at least in the sidewalls of said tire in which the carcass reinforcement has a circumferential arrangement of lengths of cord arranged side by side, said lengths being of a length less than the height of the sidewall of the tire in question, said lengths extending transversely with respect to the circumferential direction, said lengths being embedded in a matrix of elastomeric material, said circumferential arrangement being arranged in such a manner that, when the carcass reinforcement is observed in radial section, said lengths of cord show at least a certain overlap.

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5,587,031

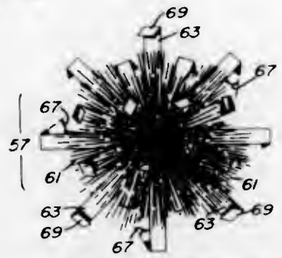
EDGE-FOLDED TINSEL GARLAND AND METHOD OF PRODUCTION

Kevin Young, Bensalem, Pa., assignor to F. C. Young & Co., Inc., Yardley, Pa.

Division of Ser. No. 298,267, Aug. 31, 1994, Pat. No. 5,500,258. This application Jul. 20, 1995, Ser. No. 504,476

Int. Cl.[6] A41G *1/04*

U.S. Cl. 156—148 **5 Claims**



1. The method of making a tinsel garland, comprising the steps of: providing an elongate strip of web material;

folding at least one edge of said web material along a longitudinal foldline defining a boundary of a side portion parallel to said edge so that said side portion is folded over face-to-face;

creasing said web material along said foldline by applying pressure to the opposite sides of the folded web;

cutting said folded web material transversally along a plurality of parallel cut lines to form a plurality of needles with free ends at said edge and an uncut portion at the center of said web material, said needles having bent tabs formed by the folded portions of the web material between said foldline and said edge; and

twisting said uncut portion of said folded and cut web about a pair of wires along a central axis forming a substantially cylindrical garland having radially-projecting needles with bent tabs at the free ends of said needles.

5,587,032

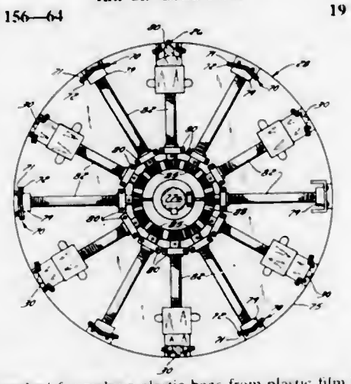
METHOD AND APPARATUS FOR REGISTRATION OF A SEAL ON A PLASTIC BAG

Stephen A. Saindon, Appleton; Peter J. Gletman, Jr., Combined Locks, and Nicholas J. Nagel, Oregon, all of Wis., assignors to CMD Corporation, Appleton, Wis.

Continuation-in-part of Ser. No. 228,566, Apr. 15, 1994, Pat. No. 5,518,559, which is a continuation-in-part of Ser. No. 105,434, Aug. 12, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 289,426

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—64 **19 Claims**



7. A method for making plastic bags from plastic film having a plurality of registration marks using a bag making machine having a cylindrical drum with a variable diameter, a circumference, an axis and at least one seal bar substantially parallel to the axis and defining the circumference, comprising,

detecting the rotation of the drum;

detecting the registration marks on the film;

determining the nominal length of the bags from the detection of the registration marks and the rotation of the drum;

determining a phase of the registration mark relative to a seal on the plastic bag;

adjusting the diameter of the drum in a first direction in response to the nominal bag length and the phase of the registration mark relative to the seal on the plastic bag such that a circumferential distance between subsequent seal bars is changed in a first direction to be substantially equal to the nominal bag length; and

continued adjusting of the diameter of the drum in the first direction such that the circumferential distance between subsequent seal bars is not substantially equal to the nominal bag length.

5,587,033

PROCESS FOR THE PREPARATION OF RADIATION IMAGE STORAGE PANELS

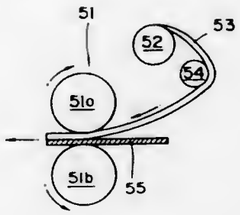
Hideki Suzuki, and Katsuhiro Kohda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 196,460, Feb. 15, 1994, which is a division of Ser. No. 692,649, Apr. 29, 1991, Pat. No. 5,306,367. This application Jun. 6, 1995, Ser. No. 468,326

Claims priority, application Japan, Apr. 27, 1990, 2-112505; May 11, 1990, 2-122380; Jun. 20, 1990, 2-161518

Int. Cl.[6] B29C *55/06;* **B32B** *31/20;31/26;* **G03C** *1/00*

U.S. Cl. 156—164 **6 Claims**



1. A process for the preparation of a radiation image storage panel comprising the steps of:

forming a phosphor sheet comprising a binder and a stimulable phosphor; and

compressing the phosphor sheet on a support under heating up to a temperature of not lower than softening point or melting point of the binder by means of a heated calender roll, keeping the phosphor sheet under tension in the range of 10–700 g/cm.

5,587,034

PROCESS FOR PULTRUDING FIBER REINFORCED FURAN COMPOSITES

Chen-Chi M. Ma, Hsinchu, Taiwan, assignor to National Science Council, Taipei, Taiwan

Filed Oct. 23, 1992, Ser. No. 965,864

Int. Cl.[6] B29C *70/52*

U.S. Cl. 156—166 **6 Claims**

1. A process for pultruding a fiber reinforced furan resin composite which comprises

drawing a plurality of continuous filaments through an impregnating batch of liquid furan resin to saturate the filaments with said resin and a squeeze orifice to remove excess resin and air, and

continuously pulling the resin-impregnated filaments through a pultrusion die to heat and cure said resin,

wherein the liquid furan resin comprises a furfuryl alcohol prepolymer which is prepared by polymerizing 100 parts by weight of furfuryl alcohol monomer with an addition of 0.05–2.5 parts by weight of an acid catalyst at a temperature of 35°–70° C. until the resulting polymerization mixture has a viscosity of 300–400 cps,

and wherein the liquid furan resin is maintained at a temperature of 15°–35° C. and has a viscosity ranging from 500–3000 cps during the impregnating step,

and wherein the pultrusion die has three heating zones through which the resin is pultruded, the first zone having a temperature range of 150°–180° C., the second zone having a temperature range of 180°–225° C., and the third zone having a temperature range of 170°–220° C., and wherein the temperature in the second zone is higher than the temperatures in the first and third zones.

5,587,035

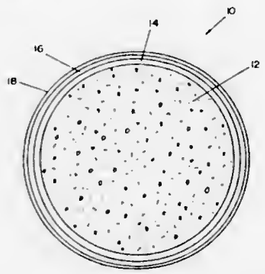
COMPOSITE FILLED HOLLOW STRUCTURE

Robert H. Greene, 131 Stable Dr., Lancaster, Pa. 17603

Division of Ser. No. 915,315, Jul. 20, 1992. This application Dec. 8, 1994, Ser. No. 352,350

Int. Cl.[6] E04G *21/00*

U.S. Cl. 156—187 **3 Claims**



1. A method of constructing a filled structure characterized by the combination of high compressive strength and tensile strength to allow a high bending load comprising:

providing a fiber reinforced resinous hollow structure having a tensile strength of at least 30,000 psi and an inside surface forming a boundary which encloses a space,

providing a mixture of particulate cementitious material and liquid which may be hardened into a hard core, said mixture being selected so that the hard core formed therefrom has a density of at least 35 pounds per cubic foot and a compressive strength of at least 1500 psi and the mixture expands its volume as it hardens,

placing the mixture within the space, and

permitting said mixture to expand and harden into the hard core within the hollow structure in such a manner that expansion of the mixture is restrained by the hollow structure and the hard core exerts a force against the inside surface of the hollow structure such that the hard core is force-fit against the inside surface to provide said filled structure.

5,587,036

PROCESS FOR THE PRODUCTION OF BLANKS FOR MOTOR VEHICLE LICENSE PLATES

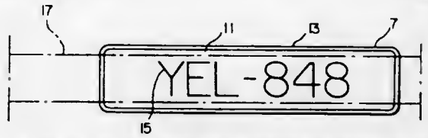
Joachim Utsch, Alte Dreisbachstr. 19, 5900 Siegen; Gerhard Utsch, and Manfred Utsch, both of Siegen, all of Germany, assignors to Joachim Utsch, Siegen, Germany

Filed Dec. 17, 1991, Ser. No. 808,768

Claims priority, application Germany, Dec. 17, 1990, 40 40 386.6

Int. Cl.[6] B32B *31/16;* **B60R** *13/10*

U.S. Cl. 156—219 **1 Claim**



1. A process for the production of automotive vehicle license plates, comprising unreeling from a coil a continuous length of metal strip, applying to said length of metal strip a colored film that imparts to said strip a series of colored rims, severing said length of strip into individual license plate blanks bordered by said rims and embossing only said rims thereby to produce raised rims about the periphery of each severed blank, subsequently embossing on said blank individual characters identifying a particular automotive vehicle, and applying to said characters a paint of a color contrasting with the background of said characters by applying to said characters a strip bearing said paint and having a width substantially less than the distance between upper and lower said rims of said blank.

5,587,037

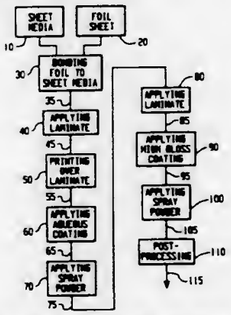
MULTI-LAYER SHEET MATERIAL HAVING A REFRACTIVE SURFACE AND METHOD FOR MAKING SAME

Alan E. Fellner, Macedonia, Ohio, assignor to Custom Graphics, Solon, Ohio

Filed Nov. 23, 1994, Ser. No. 344,566

Int. Cl.[6] B44C *1/165*

U.S. Cl. 156—231 **8 Claims**



1. A process for making a multi-layer metallic-foil printed sheet material comprising the steps of:

positioning a sheet media and a foil sheet having a carrier and metal foil thereon, in a stamping press;

moving a heat transfer plate die into engagement with the carrier of the foil sheet and pressing the sheet media against the foil sheet with the die, said die having reliefs etched therein;

releasing from the foil sheet a metal foil design shape by supplying heat to the die, said metal foil design shape corresponding to the reliefs etched in the die;

bonding the metal foil design shape to the sheet media by means of heat supplied by the die;

applying a first laminate coating over the surface of the sheet media having the metal foil design shape thereon;

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applying printing ink to the first laminate coating using an offset printing press;

applying a second laminate coating over the printing ink; and

applying a high gloss coating over the second laminate coating.

5,587,038

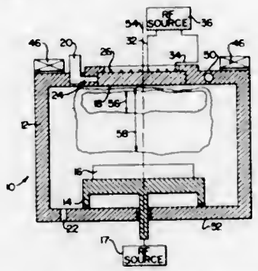
APPARATUS AND PROCESS FOR PRODUCING HIGH DENSITY AXIALLY EXTENDING PLASMAS

Joseph L. Cecchi, and James E. Stevens, both of Albuquerque, N.M., assignors to Princeton University, Princeton, N.J.

Filed Jun. 16, 1994, Ser. No. 261,853

Int. Cl.[6] C23F *1/02*

U.S. Cl. 156—345 **18 Claims**



1. An apparatus for producing a plasma comprising:

a processing chamber;

gas supplying means for supplying gas to said processing chamber;

a radio frequency power source;

an electrically conductive planar antenna located outside of said processing chamber and electrically coupled to said radio frequency power source to generate a helicon wave in said processing chamber and thereby produce a plasma of a gas in said processing chamber; and

magnetic field generating means located outside of said processing chamber for generating a magnetic field within said processing chamber, said magnetic field generating means generating a magnetic field within said chamber substantially perpendicular to the plane of said planar antenna, the magnetic field causing elongation of said plasma in said processing chamber.

5,587,039

PLASMA ETCH EQUIPMENT

Siamak Salimian, Sunnyvale; Michelangelo Delfino, Los Altos, and Bu-Chin Chung, Saratoga, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 818,662, Jan. 9, 1992, Pat. No. 5,376,233. This application Sep. 12, 1994, Ser. No. 304,719

Int. Cl.[6] H01L *21/302*

U.S. Cl. 156—345 **6 Claims**

1. In an ECR plasma processing apparatus having a microwave generator coupled to a plasma generating chamber, said plasma generating chamber being disposed in a magnetic field, the maximum intensity of said magnetic field being aligned with the axis of said plasma generating chamber, an interior region of said plasma generating chamber being isolated from said microwave generator by a dielectric microwave window having a first face and a second face, said first face forming an interior wall of said interior region and said second face being parallel to said first face, the improvement comprising:

said first face of said dielectric microwave window coated with a layer of alumina to preclude plasma etching of and release of oxygen from said first face; and

said second face of said dielectric microwave window formed of a quartz dielectric material.

5,587,040

APPARATUS FOR MANUFACTURING RECAPPED TIRE

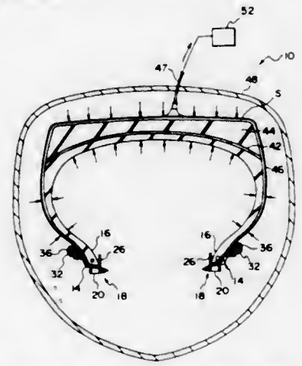
Mikio Fujimoto, Higashimurayama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 28, 1995, Ser. No. 563,484

Claims priority, application Japan, Dec. 5, 1994, 6-300843

Int. Cl.[6] B29D *30/54*

U.S. Cl. 156—394.1 **20 Claims**



1. An apparatus for manufacturing a recapped tire, comprising:

a vulcanizer in which is filled a fluid for vulcanization for adhering by vulcanization a base tire and a tread;

a rim to which the base tire is mounted;

an envelope which is annular and covers an outer periphery of the base tire;

suction means for sucking air from between the base tire and said envelope;

a tube which is annular and expandable and contractible, said tube being provided at a portion of said rim corresponding to an outer side of the base tire along a tire axial direction, and pushing said envelope against a bead portion of the base tire;

a stopper provided at a portion of said rim corresponding to an inner side of the base tire along the tire axial direction, and preventing movement of the bead portion toward the inner side of the base tire along the tire axial direction; and

internal pressure providing means for providing internal pressure to said tube so as to inflate said tube.

5,587,041

COMPOSITE PREPREG APPLICATION DEVICE

Donald A. Sandusky, Williamsburg, and Joseph M. Marchello, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

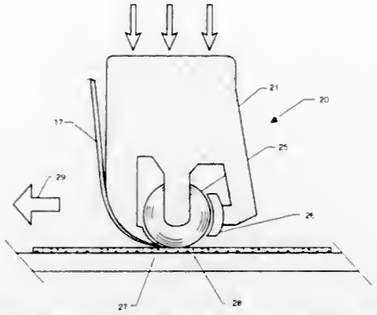
Division of Ser. No. 411,231, Mar. 21, 1995, abandoned. This application Jun. 1, 1995, Ser. No. 457,608

Int. Cl.[6] B65H *81/00*

U.S. Cl. 156—441 **2 Claims**

1. A device for applying composite prepreg comprising:

an attachment base having means for attaching to a conventional robotic lay-up machine and having an electrical supply and cooling fluid supply;



a heated shoe assembly attached to said attachment base and enclosing a means for heating said shoe assembly; and

a pressure roller rotatably attached to said attachment base, said roller having a means for cooling which comprises an external cooling shoe.

5,587,042

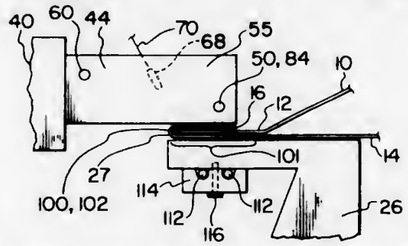
ADHESIVE CURING SYSTEM AND METHOD FOR A HEMMING MACHINE

Lucien St. Denis, Windsor, Canada, assignor to E. R. St. Denis & Sons Ltd., Oldcastle, Canada

Continuation-in-part of Ser. No. 307,470, Sep. 19, 1994, abandoned. This application May 17, 1995, Ser. No. 443,334

Int. Cl.[6] B32B *31/20;* **C09J** *5/06*

U.S. Cl. 156—477.1 **14 Claims**



1. A machine for hemming a flange on a first rigid panel with an edge portion of a second rigid panel to form a hem, one of said panels having adhesive located in the hem, said machine comprising:

(a) a panel support nest having a top surface for supporting the first panel and the second panel in a superimposed relation with the edge portion of the second panel proximate to the flange of the first panel;

(b) a support surface heater for heating a portion of the support surface of the support nest;

(c) a plurality of first flange bending members having bevelled engaging surfaces, the first flange bending members being located at a pre-hem position;

(d) a plurality of second flange bending members located at a final hem position;

(e) a second flange bending member heater for heating a section of each of the plurality of second flange bending members;

(f) means for moving the support nest to the pre-hem position such that the flange of the first panel is pressed against the bevelled engaging surfaces of the first flange bending members wherein the flange of the first panel is bent to approximately 45° with respect to the plane of the first panel to form a pre-hemmed flange; and

(g) means for moving the support nest to the final hem position such that the pre-hemmed flange is pressed against the second flange bending members, wherein said pre-hemmed flange of the first panel is bent to fully clinch said edge portion of the second panel to form the hem and whereby upon forming the hem the adhesive is heated and at least partially cured.

5,587,043

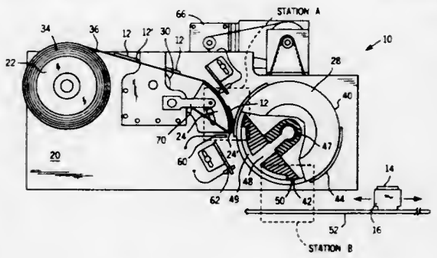
THIN LABEL APPLICATOR

Clement F. Hying, Menomonee Falls; Jack E. Perko, Cedarburg, and Larry E. Wenzler, Oak Creek, all of Wis., assignors to Brady USA, Inc., Milwaukee, Wis.

Filed Jun. 5, 1995, Ser. No. 462,298

Int. Cl.[6] B65C *9/00*

U.S. Cl. 156—566 **8 Claims**



1. A device for applying adhesive coated, thin labels carried on a web roll in which each label has a leading edge, a trailing edge, an adhesive face and a nonadhesive face, said device comprising:

a. a label drum for holding the web roll;

b. a peel plate around which the label bearing web is guided, wherein an abrupt change in direction of the web around the peel plate initiates separation of the leading edge of a label from the web;

c. a vacuum transfer drum for picking up the separated labels at a pick-up station adjacent said peel plate and moving the labels to a transfer station, said vacuum transfer drum comprising:

i. a drum;

ii. at least one vacuum pad mounted on the periphery of said drum, said vacuum pad having a plurality of apertures;

iii. vacuum means in the interior of said drum for applying a negative pressure at the surface of said vacuum pad by way of said apertures, wherein said vacuum means applies said negative pressure only as the drum rotates between the pick-up station and the transfer station;

d. a take-up drum for receiving the web after the labels have been removed;

e. means for driving the web between said label drum and said take-up drum;

f. a shuttle for holding and moving articles to and from the transfer station, such that articles are placed in contact with labels as the labels arrive at the transfer station;

g. a first sensor for detecting the position of the shuttle;

h. a second sensor for detecting the position of the drum;

i. a third sensor for detecting when web mounted labels are in position for being picked up; and

j. a fourth sensor for detecting either the leading edge or trailing edge of a label as it is held on said vacuum pad to verify the position of the label on the pad for proper alignment with the article carried by said shuttle.

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5,587,044

LABEL CASSETTE RETAINING DEVICE FOR LABELER

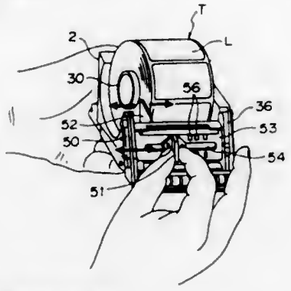
Fumio Goto, Iwate-ken, Japan, assignor to Kabushiki Kaisha Sato, Japan

Continuation-in-part of Ser. No. 133,624, Oct. 8, 1993, Pat. No. 5,403,431. This application Apr. 8, 1994, Ser. No. 225,052

Claims priority, application Japan, Oct. 18, 1992, 4-75906; Mar. 10, 1994, 6-003376

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—577 **6 Claims**



1. A labeler comprising:

a main body;

a label cassette for holding a roll of labels, the roll of labels comprising a label strip of separate labels and a continuous backing strip to which the labels are separably adhered;

label strip advancing means for advancing the label strip off the roll;

label removing means for engaging the label strip after it has left the roll and for removing the labels from the backing strip;

an outlet from the main body for labels removed from the backing strip; and

a retainer on the label cassette for restricting lateral movement of and for guiding the label strip moving off the label roll and being adjustable for different width label strips, the retainer comprising:

a first side plate for engaging one side edge of the label strip;

a second side plate for engaging the other side edge of the label strip; the second side plate being movable toward or away from the first side plate for adjusting the space between the plates for guiding different width label strips; and

a grip for moving the second side plate and for engaging a slot on the main body.

5,587,045

GETTERING OF PARTICLES FROM AN ELECTRO-NEGATIVE PLASMA WITH INSULATING CHUCK

John H. Keller, Newburgh, and Gregory Costrini, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1995, Ser. No. 430,040

Int. Cl.[6] H01L *21/306*

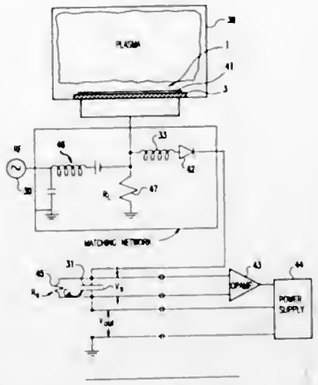
U.S. Cl. 156—627.1 **5 Claims**

1. In a plasma processing system used in the manufacture of semiconductor circuits wherein a semiconductor wafer is mounted on a negative electrode and exposed to a plasma discharge, said wafer being separated from said negative electrode by an insulator, an apparatus for preventing negatively charged particulates from going to the wafer when the plasma discharge is turned off, said apparatus comprising:

a sensing device connected to said negative electrode through a diode and a choke;

a source of voltage between said sensing device and circuit ground; and

bias control means connected across said capacitor for controlling said source of voltage to maintain a small negative bias on said wafer when plasma density decays to zero.



5,587,046

PROCESS FOR TREATING SEMICONDUCTOR MATERIAL WITH AN ACID-CONTAINING FLUID

Maximilian Stadler, Haiming; Günter Schwab, Emmerting; Peter Romeder, Burghausen, and Gabriele Trifellner, Winhoring, all of Germany, assignors to Wacker Siltronic Gesellschaft Für Halbleitermaterialien Aktiengesellschaft, Burghausen, Germany

Filed Apr. 10, 1995, Ser. No. 419,362

Claims priority, application Germany, Apr. 28, 1994, 44 14 925.5

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—662.1 **10 Claims**

3. A process for treating semiconductor material with an acid-containing fluid, water being formed as the product of a chemical reaction, which comprises

adding phosphorus pentoxide to the acid-containing fluid during the treatment of the semiconductor material.

5,587,047

METHOD FOR SEPARATING BORIC ACID

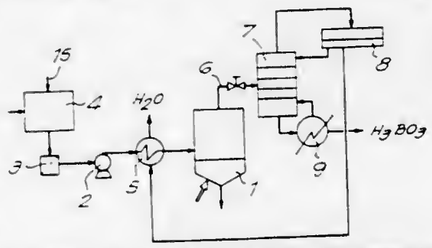
Aimé Bruggeman, Retie, and Johan Braet, Nazareth, both of Belgium, assignors to Studiecentrum voor Kernenergie, Belgium

Continuation of Ser. No. 260,786, Jun. 16, 1994, Pat. No. 5,468,347. This application Sep. 8, 1995, Ser. No. 525,216

Claims priority, application Belgium, Jun. 16, 1993, 09300608

Int. Cl.[6] B01D *1/00;3/38;* **G21F** *9/08*

U.S. Cl. 159—47.300 **17 Claims**



1. A method for removing boric acid from water having boric acid dissolved therein which comprises introducing said water having boric acid dissolved therein into an evaporator wherein the temperature in the evaporator is more than 100° C. and the pressure in the evaporator is above atmospheric pressure; said water having a substantially neutral or acidic pH; heating said water to form steam whereby boric acid is removed from said water by transfer from said water to said steam so as to produce steam enriched with boric acid; removing said boric acid enriched steam from said evaporator and removing, from the evaporator, the water from which boric acid has been removed.

10. A method for removing boric acid from a liquid containing boric acid which comprises introducing a liquid containing boric acid into an evaporator wherein the temperature in the evaporator is more that 100° C. and the pressure in the evaporator is above atmospheric pressure; and liquid having a substantially neutral or acidic pH; introducing steam into said evaporator wbereby boric acid is removed from said liquid by transfer from said liquid to said steam so as to produce steam enriched with boric acid; removing said boric acid enriched steam from said evaporator and removing, from the evaporator, the liquid from which boric acid has been removed.

5,587,048

PULP AND PAPER PRODUCTS PRODUCED FROM RECYCLED, HIGH LIGNIN CONTENT, WASTE PAPER

Robert C. Streisel, Mt. Pleasant, S.C.; Mark A. Hank; Leo T. Mulcahy, both of Covington, Va., and Ralph S. Peterson, Clifton Forge, Va., assignors to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 216,448, Mar. 23, 1994, abandoned, which is a division of Ser. No. 21,662, Mar. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 862,996, Apr. 6, 1992, abandoned. This application Mar. 15, 1996, Ser. No. 616,762

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—7 **5 Claims**

1. A fiber pulp for a generally streak and scratch-free blade-coated paper from a furnish having at least 10% by weight of said fiber pulp produced from recycled paper substantially comprised of recycled corrugated containers, said fiber pulp containing less than about 20 ppm per unit area of solid, non-fibrous contaminants of a size greater than 0.05 mm^2, said fiber pulp being produced from said recycled paper by a method comprising the steps of:

a) combining a quantity of paper substantially comprised of corrugated containers to be recycled, containing lignin, cellulosic fibers and solid non-fibrous contaminants, with an aqueous liquid to form a slurry containing about 9–15% by weight solids and agitating said slurry in a low shear mixer at a temperature of less than 65.6° C. for a time sufficient to separate said lignin and cellulosic fibers from said solid contaminants without significantly degrading said solid contaminants, and then sequentially;

b) removing from said slurry gross contaminants of a size in a range greater than about 5 mm^2 by passing said slurry through holes of a predetermined diameter;

c) removing from said slurry contaminants having a specific gravity in a range greater than 1;

d) removing from said slurry intermediate contaminants having a size in a range greater than about 2 to 3 mm^2 by passing said slurry through holes of a predetermined size;

e) removing sand from said slurry;

f) removing from said slurry fine contaminants of a size in a range at least about 0.15 mm^2, by passing said slurry through elongated slots of a predetermined width;

g) removing from said slurry by centrifugal means contaminants having a specific gravity less than 1;

h) dewatering said slurry to form a wet, friable pulp having a moisture content of about 30–60%;

i) digesting said pulp in a cooking liquor for a time and at a temperature sufficient to hydrolyze a substantial portion of said lignin remaining in intimate association with said cellulosic fibers wherein said digesting takes place at a target temperature in a range of 121° –150° C.; and

j) separating said digested pulp from spent cooking liquor.

5,587,049

PROCESS FOR DELIGNIFYING RAW CELLULOSIC MATERIAL IMPREGNATED WITH MONOPERSULPHURIC ACID

Fausto Marzolini; Giulio Calmanti, both of Milan, and Gianpiero Sacchi, Trivolzio, all of Italy, assignors to Ausimont S.p.A., Italy

Continuation of Ser. No. 9,719, Jan. 27, 1993, abandoned. This application Apr. 8, 1994, Ser. No. 225,353

Claims priority, application Italy, Jan. 31, 1992, MI92A0192

Int. Cl.[6] D21C *3/04;3/26*

U.S. Cl. 162—40 **6 Claims**

1. A process for delignifying raw lignocellulosic material comprising:

(1) a first step comprising:

(a) impregnating raw lignocellulosic material with an acid solution containing monopersulphuric acid or salts thereof in an amount ranging from 0.3 to 14% by weight of dry cellulose and sulphuric acid in an amount ranging from 0.4 to 18% by weight of dry cellulose, at a temperature lower than 20° C. and for a time ranging from 5 to 90 minutes to form impregnated lignocellulosic material;

(b) thickening the impregnated lignocellulosic material of step (1)(a) to obtain a concentrated pulp of impregnated lignocellulosic material containing from 5 to 30% of dry matter by separating the acid solution from the impregnated lignocellulosic material without any washing of the impregnated lignocellulosic material with water;

(c) recycling at least a portion of the solution obtained from the thickening of step (1)(b) to the acid solution of step (1)(a), and

(2) conducting a second step prior to any washing of the impregnated lignocellulosic material of step (1) with water comprising:

treating the thickened, impregnated lignocellulosic material of step (1) with an alkaline medium at a pH higher than 9 to 12.5, at a temperature lower than 40° C., and for a time sufficient to obtain a substantial reduction in the amount of lignin contained in the thickened, impregnated lignocellulosic material.

5,587,050

Patent Not Issued For This Number

5,587,051

SIMPLIFIED LASER APPARATUS AND METHOD FOR MEASURING STOCK THICKNESS ON PAPERMAKING MACHINES

Volker Ostermayer, 209 Gilderbrook Rd., Greenville, S.C. 29615, and Thomas B. Fleischer, 108 Meadowood Ct., Pelzer, S.C. 29669

Continuation-in-part of Ser. No. 282,924, Jul. 29, 1994. This application Nov. 14, 1994, Ser. No. 337,770

Int. Cl.[6] D21F *7/00;* **G01N** *21/90*

U.S. Cl. 162—198 **31 Claims**

1. An apparatus for monitoring the de-watering performance of a forming section of a papermaking machine, said forming section including an associated structure having a side frame and an endless paper forming fabric which travels about a plurality of rolls; said paper forming fabric having an upper horizontal run, a head box for depositing paper stock consisting of a water/fiber mixture on top of said upper horizontal run of said forming fabric; a plurality of de-watering mechanisms disposed sequentially underneath said fabric along said upper horizontal run of said fabric for removing water from said stock; wherein said apparatus comprises:

a carrier stand having a pair of spaced apart legs including a top leg and a bottom leg for being positioned above and below said horizontal run of said fabric, respectively;

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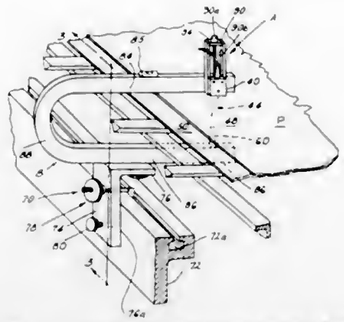


a laser instrument carried by said top leg portion of said carrier stand and having a laser beam;

a baseline contact device carried by said bottom leg portion of said carrier stand for contacting a bottom surface of said horizontal run of said fabric to establish a baseline reference a first distance directly below said laser instrument;

said carrier stand positioning said laser instrument above said upper horizontal run of said forming fabric so that said laser beam is reflected from a top horizontal surface of said paper stock and said carrier stand supporting said baseline device which contacts said bottom surface of said upper horizontal run of said forming fabric which is devoid of said paper stock;

said laser instrument including a laser displacement meter having a receiver for receiving said reflected laser beam of said laser meter and generating a signal corresponding to said reflected laser beam and distance to said upper run of said fabric; and

a controller for receiving said signal and for computing and generating an output representative of a thickness of said paper stock, and hence the relative water content of said stock, based on said signal and said baseline reference.

5,587,052

APPARATUS AND METHOD FOR TENSIONING A FABRIC IN A PAPER MACHINE

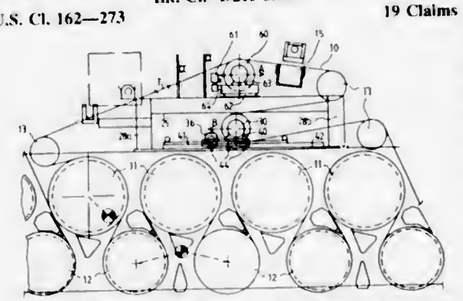
Jukka Autio, Karstula, and Timo Kujala, Jyvaskyla, both of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Jan. 27, 1994, Ser. No. 189,115

Claims priority, application Finland, Jan. 29, 1993, 930398

Int. Cl.[6] D21F *3/00*

U.S. Cl. 162—273 **19 Claims**



1. Apparatus for tensioning a fabric in a paper machine, comprising

a frame defining a driving side of the apparatus on a first side thereof and an operating side of the apparatus at a second side thereof opposite to said first side,

a tensioning roll mounted on said frame and arranged in a loop of the fabric,

bearing supports for supporting ends of said tensioning roll,

sledges to which said bearing supports are fixed at the driving side and at the operating side of the apparatus,

a drive motor for moving said sledges synchronously in relation to one another to thereby regulate the tension in the fabric that runs over said tensioning roll,

linear guide means for guiding movement of said sledges in a substantially linear direction, said linear guide means comprising linear guide rails coupled to said frame and linear ball-bearing units coupled to said sledges, said linear ball-bearing units engaging with said linear guide rails,

shafts journalled on said sledges and operated by said motor to displace said sledges guided along said linear guide rails of said linear guide means, and

synchronization means for synchronizing said shafts journalled on said sledges and thus the movement of said sledges.

5,587,053

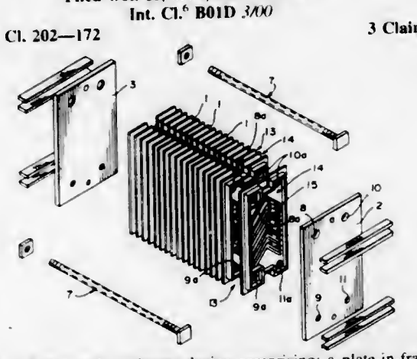
BOILER/CONDENSER ASSEMBLY FOR HIGH EFFICIENCY PURIFICATION SYSTEM

Robert C. Keith, Redondo Beach, Calif., assignor to Grano Environmental Corporation, Carson, Calif.

Filed Oct. 11, 1994, Ser. No. 320,233

Int. Cl.[6] B01D *3/00*

U.S. Cl. 202—172 **3 Claims**



1. A boiler and condenser device comprising: a plate-in-frame heat exchanger including a plurality of vertically extending common plate members, a plurality of alternating boiling and condensing chambers on opposite sides of said common plate members, means for conveying feed material into said boiling chambers, means for conveying vapors from said boiling chambers into said condensing chambers, a face of each common plate member in a condensing chamber having a corrugated herringbone surface configuration, a plurality of diagonal vapor flow paths for directing vapors from the boiling chambers diagonally across the condensing chamber, the corrugated surfaces of oppositely facing adjacent common plate members having portions in abutting relationship to form contact points between adjacent common plate members, said contact points providing accumulation points for liquid forming on condensing surfaces of said common plate members, a plurality of diagonal liquid flow paths adjacent the diagonal vapor flow paths for directing the liquid to flow down the condensing surface into run-off streams, and a run-off area on the condensing surfaces communicating with the lower ends of the diagonal liquid flow paths for carrying a large volume of liquid off the plate members while occupying a small portion of the total surface area of the plate.

5,587,054

VAPOR COMPRESSION DISTILLATION SYSTEM

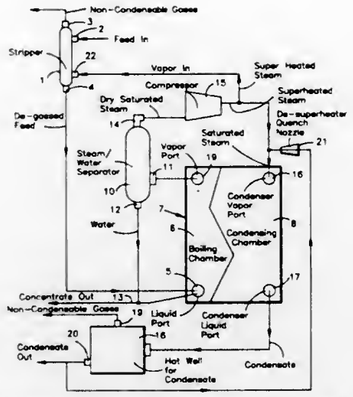
Robert C. Keith, Redondo Beach, Calif., assignor to Grano Environmental Corporation, Carson, Calif.

Filed Oct. 11, 1994, Ser. No. 320,235

Int. Cl.[6] B01D *3/10*

U.S. Cl. 202—182 **4 Claims**

1. A vapor compression distillation system comprising, a plate-in-frame heat exchanger including a plurality of vertically extend-



ing plate members, a plurality of alternating boiling and condensing chambers on opposite sides of said plate members, means for conveying incoming feed material into said boiling chambers, a vacuum pump for providing the system with a vacuum for matching the temperature of the boiling chambers with the temperature of the incoming feed material, the inlet of said vacuum pump communicating with non-condensable gases from the incoming feed material and non-condensable gases from a condensate, a vapor outlet port communicating with said boiling chambers, a compressor having an inlet communicating with said boiling chambers, said compressor having an outlet communicating with a vapor inlet port for said condensing chambers, means for flowing an evaporated portion of the feed material in the boiling chambers through the vapor outlet port into the compressor to form superheated steam, means for feeding said superheated steam from the outlet of said compressor to an inlet of said condensing chambers, a condensate outlet port communicating with said condensing chamber, a quench nozzle positioned in proximity to and being in communication with the vapor inlet port of the condensing chambers, and means for directing a portion of condensate through the quench nozzle into the vapor inlet port for desuperheating the superheated system to reduce the steam temperature to saturated steam temperature as it enters the condensing chambers, such that the condensing chambers are maintained at a higher temperature than the boiling chambers, heat released by the steam as it condenses in the condensing chambers on one side of the plate members being transmitted through the plate members to the opposite side thereof into the boiling chambers to evaporate the incoming feed material, thereby providing a high heat transfer coefficient between the steam and plate members.

5,587,055

WATER DISTILLING APPARATUS AND METHOD

Michael O. Hartman, 7553 Brazil Rd., Benton, Ark. 72015; Dale J. Kinder, Benton, Ark.; Randy E. Rainey, Conway, Ark.; Arthur R. Helmich, and Daniel E. Willis, both of Benton, Ark., assignors to Michael O. Hartman, Benton, Ark.

Continuation-in-part of Ser. No. 143,437, Oct. 26, 1993, Pat. No. 5,484,510. This application Oct. 21, 1994, Ser. No. 327,038

Int. Cl.[6] B01D *3/42;* **C02F** *1/04*

U.S. Cl. 203—1 **22 Claims**

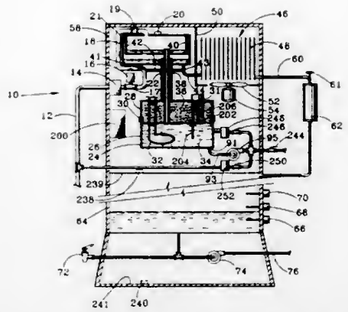
21. A method of operating a water distillation unit, comprising:

providing an evaporation unit and a heating member within a heating pan to purify incoming water containing contaminants;

inputting water to the heating pan;

activating the heating member within the heating pan to generate steam;

cooling the steam within a condenser unit to form water condensate;



positioning a total dissolved solids probe within the heating pan for measuring total dissolved solids values; and

partially flushing water from the heating pan in response to the measured total dissolved solids value to lower the total dissolved solids content of the water in the heating pan.

5,587,056

SEPARATION OF ALIPHATIC DIACIDS FROM ADIPIC ACID ADMIXTURES THEREOF

Philippe Denis, Decines; Carl Patois, Lyon, and Robert Perron, Charly, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Jun. 14, 1995, Ser. No. 490,231

Claims priority, application France, Jun. 14, 1994, 94 07505

Int. Cl.[6] B01D *3/34*

U.S. Cl. 203—29 **22 Claims**

1. A process for the separation of at least a fraction of at least one branched, saturated aliphatic diacid having 6 carbon atoms from an admixture thereof with at least adipic acid, comprising at least partially converting said at least one aliphatic diacid in said admixture in the presence of a homogeneous acid catalyst soluble in said admixture and having a pKa less than or equal to 5, or in the presence of a heterogeneous acid catalyst into a corresponding anhydride thereof, and removing said corresponding anhydride or said adipic acid from said admixture.

5,587,057

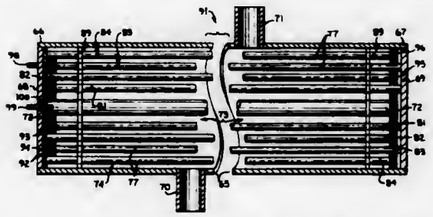
HIGHLY CONDUCTIVE LIQUID MEDIA ELECTROCOAGULATION

David M. A. Metzler, 1001 Winchester, Kansas City, Mo. 64126, and Albert L. Mauk, Kansas City, Kans., assignors to David M. A. Metzler, Kansas City, Mo.

Continuation-in-part of Ser. No. 854,360, Mar. 19, 1992, Pat. No. 5,271,814. This application Dec. 7, 1993, Ser. No. 163,683

Int. Cl.[6] C25D *17/00*

U.S. Cl. 204—228 **9 Claims**



1. An electrolytic treater apparatus for liquids and comprising:

(a) an elongated tubular housing formed of conductive material and closed at opposite ends to form an elongated treater chamber;

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(b) means forming a first fluid connection and a second fluid connection positioned respectively adjacent said opposite ends and defining a flow path through said treater chamber;

(c) power supply means having a first power supply terminal and a second power supply terminal of opposite polarities and having an output voltage;

(d) an elongated electrode structure extending through said chamber, said electrode structure having multiple conductive sections insulated from one another;

(e) said power supply means being connected to said housing and said electrode structure in such a manner that, with a conductive liquid present in said chamber, said output voltage is divided across said electrode structure sections; and

(f) flow reversing valve means fluidically connected to said first and second fluid connections and being reversibly operable to flow a fluid through said flow path in a first direction from the first connection to the second connection or in the reverse direction from the second connection to the first connection.

5,587,058

ELECTRODE AND METHOD OF PREPARATION THEREOF

Victor V. Gorodetsky; Vladimir A. Neburchilov, and Y. M. Kolotyrkin, all of Moscow, Russian Federation, assignors to Karpov Institute of Physical Chemiestry, Moscow, Russian Federation

Filed Sep. 21, 1995, Ser. No. 531,405

Int. Cl.[6] C25B *11/08;11/10*

U.S. Cl. 204—290 F **6 Claims**

1. An electrode for electrolysis of solutions of electrolytes comprising a support of film forming metal or alloy thereof, having a composite coating consisting essentially of oxides of metals selected from the group consisting of iridium, ruthenium, titanium and tantalum having molar ratios $(IrO_2+RuO_2):(TiO_2+Ta_2O_5)$ of (1-19):(3-1) wherein $IrO_2:RuO_2$ is (24-4):1, and $TiO_2:Ta_2O_5$ is 1:(0-0.05).

5,587,059

ANTICORROSIVE CATHODIC ELECTRODEPOSITION PAINT

Shuhei Yamoto, Hirakata; Koji Ito, Ibaraki, and Mitsuo Yamada, Suita, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Aug. 10, 1995, Ser. No. 513,232

Claims priority, application Japan, Aug. 11, 1994, 6-212094; Aug. 11, 1994, 6-212095

Int. Cl.[6] C25D *9/02*

U.S. Cl. 204—505 **21 Claims**

1. In a cathodic electrodeposition paint composition comprising a cationic film-forming epoxy resin and a crosslinker, said crosslinker is a blocked polyisocyanate, both dispersed in an aqueous medium containing a neutralizing agent, the improvement wherein

said paint composition further comprises an anticorrosively effective amount of a combination of a water-soluble cerium compound and either a polyvalent metal phosphomolybdate or a copper compound.

5,587,060

METHOD OF REMOVING METAL CONTAINED IN SOLUTION

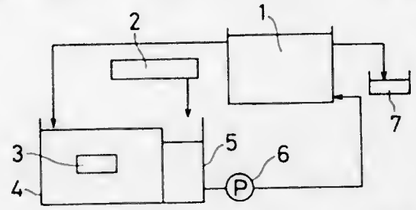
Naoki Abe, Okazaki; Koji Mizuno, Toyota; Masayuki Sumiyoshi, Okazaki; Katsuya Murakami, Toyota; Kojiro Murayama, Toyota; Koichi Sugiura, Toyota; Fumio Kawahara, Toyota; Mitsuru Tomono, Toyota, and Heijiro Ojima, 7, Shimoshigehara-cho 4-chome, Kariya-shi, Aichi-ken, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha; MEC International Corporation, both of Toyota, and Heijiro Ojima, Kariya, all of Japan

Filed Sep. 12, 1995, Ser. No. 527,206

Claims priority, application Japan, Sep. 13, 1994, 6-219103; Aug. 11, 1995, 7-205765; Aug. 28, 1995, 7-218820

Int. Cl.[6] B01D *17/06;* **C02F** *1/48*

U.S. Cl. 204—554 **4 Claims**



1. A method of separating metal from a metal-containing solution, comprising the steps of:

adding a surface active agent containing a hydrophilic group, a hydrophobic group and a chelating group to a metal-containing solution;

applying an electric field to the mixture solution containing the surface active agent obtained in the preceding step; and

separating an aggregate from the solution in which the surface active agent having chelated metal has been aggregated in the preceding two steps.

5,587,061

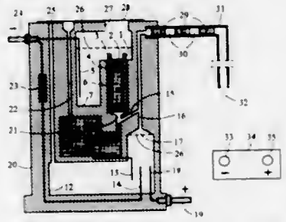
DEVICE AND METHOD FOR BIOMOLECULE PURIFICATION

Stephen L. Chen, 1300 SW. 185th Ave., Aloha, Oreg. 97007

Filed Nov. 28, 1995, Ser. No. 563,445

Int. Cl.[6] G01N *27/26;27/447*

U.S. Cl. 204—613 **6 Claims**



1. A device of modified preparative gel electrophoresis for biomolecule purification, comprising

a lower chamber containing a first buffer and electrode for conducting an electric field of electrophoresis,

a balance channel, with a substantially reduced volume capacity, uprising from said lower chamber, said balance channel being sealable by a sealing means for trapping air bubbles generated within said lower chamber,

an upper chamber containing a second buffer and an electrode for conducting said electric field of electrophoresis,

an inlet on top side of said upper chamber, said inlet being sealable by said sealing means for trapping air bubbles generated within said upper chamber,

an air chamber containing said second buffer and three electrodes immersed in said second buffer,

a silicon diode in electric circuit having direct connection with one of said three electrodes in said air chamber for controlling electric current of said one of said three electrodes,

a vent connected to said air chamber, said vent being sealable by said sealing means for trapping air bubbles generated within said air chamber,

a column channel vertically connecting said upper chamber to said lower chamber via a buffer channel, said buffer channel, with a substantially reduced diameter, located between said column channel and said lower chamber and join to said lower chamber at a site immersed in said first buffer, said column channel located beneath said inlet with said upper chamber and immersed by said second buffer from said upper chamber,

a gel column fitted in said column channel loosely for easy placement,

gap between said gel column and said column channel being permeable for said second buffer from said upper chamber to said buffer channel, and

a fraction storage tubing receiving an outflow of said first buffer from said lower chamber, an outflow of said second buffer from said upper chamber, and an outflow of said air bubbles from said air chamber via a channel means, said channel means linked to said buffer channel at the middle and joined to said air chamber on its top.

5,587,062

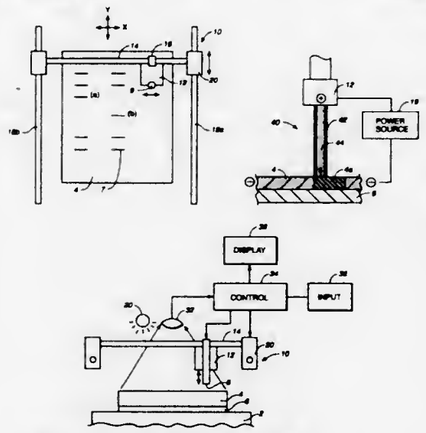
SAMPLE COLLECTING APPARATUS BY GEL ELECTROPHORESIS

Yoshiyuki Togawa, Osaka, and Makoto Miura, Kyoto, both of Japan, assignors to Shimadzu Corporation, Japan

Filed Jan. 24, 1996, Ser. No. 592,872

Int. Cl.[6] G01N *27/26;27/447*

U.S. Cl. 204—613 **13 Claims**



1. A sample collecting apparatus comprising:

a base table for placing a gel thereon;

a cutting tool disposed above said base table for cutting out a specified part of said gel;

a moving mechanism for moving said cutting tool three-dimensionally for causing said cutting tool to cut out said specified part of said gel;

a detector for optically detecting migration patterns in said gel placed on said base table; and

a control device for controlling said moving mechanism according to detection by said detector so as to cause said cutting tool to cut out said specified part of said gel.

7. A sample collecting apparatus comprising:

a base table for placing a gel thereon;

an extractor disposed above said base table for extracting by electrophoresis a migration band at a specified part of said gel;

a moving mechanism for moving said extractor three-dimensionally for causing said extractor to extract said migration band at said specified part of said gel;

a detector for optically detecting migration patterns in said gel placed on said base table; and

a control device for controlling said moving mechanism according to detection by said detector so as to cause said extractor to extract said migration band at said specified part of said gel.

5,587,063

METHOD FOR ELECTROLYTIC COLORING OF ALUMINUM SURFACES USING ALTERNATING CURRENT

Peter Kuhm, Hilden; Christine Schroeder, Duesseldorf; Volker Sander, Hilden; Juergen Lindener, and Loert De Riese-Meyer, both of Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/03574, § 371 Date Jul. 28, 1995, § 102(e) Date Jul. 28, 1995, PCT Pub. No. WO94/15002, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 16, 1993, Ser. No. 464,702

Claims priority, application Germany, Dec. 24, 1993, 42 44 021.1

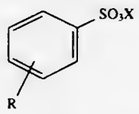
Int. Cl.[6] C25D *11/22*

U.S. Cl. 205—173 **20 Claims**

1. A process for the electrolytic alternating-current coloring of anodized aluminum surfaces, said process comprising steps of:

(A) providing an acidic coloring bath A that is substantially free from tin(II) ions and silver ions but contains copper(II) ions and an electrolyte additive A' selected from the group consisting of

(A'.a) benzene sulfonates corresponding to general formula (I):



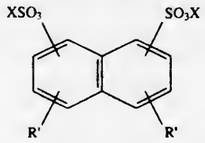
(I)

in which

R stands for one or more position-isomeric moieties, each of which is hydrogen, hydroxyl, carboxyl or aldehyde, with the proviso that not more than one is a carboxylic group (COOX), and

X represents hydrogen or sodium or potassium cation, and

(A'.b) naphthalene disulfonates corresponding to general formula (II):



(II)

in which

R' stands for one or more position-isomeric moieties, each of which is hydrogen, hydroxyl, carboxyl or aldehyde, with the proviso that no hydroxy group is present in the 1-position of the naphthalene ring, and

X is as defined above;

(B) providing an acidic coloring bath B that is substantially free from copper(II) ions but contains (B.1) tin(II) ions, silver ions, or both tin(II) and silver ions; and, if bath B contains tin(II) ions, also contains (B.2) an electrolyte additive B' containing:

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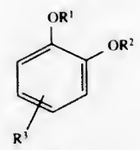
(B'.1) at least one stabilizer for tin(II) ions, said at least one stabilizer corresponding to one of the general formulas (III) to (VII):

(III)



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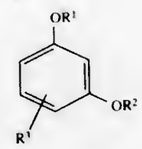
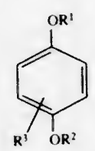
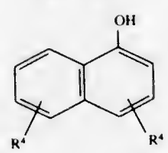


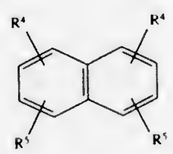
(V)



(VI)



(VII)



in which

R^1 and R^2 represent hydrogen, alkyl, aryl, alkylaryl, alkylaryl sulfonic acid, alkyl sulfonic acid and alkali metal salts thereof containing 1 to 22 carbon atoms,

R^3 represents one or more hydrogen and/or alkyl, aryl, alkylaryl moieties containing 1 to 22 carbon atoms,

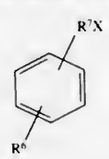
R^4 represents one or more sulfonic acid groups (SO_3X),

R^5 represents one or more hydrogen and/or alkyl, aryl and alkylaryl moieties containing 1 to 22 carbon atoms and

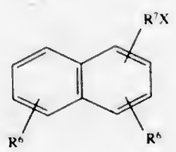
X is as defined above,

at least one of the substituents R^1, R^2 and R^3 not being hydrogen; and (B'.2) at least one throw improver corresponding to one of the general formulae (VIII) and (IX):

(VIII)



(IX)



in which

R^6 stands for one or more position-isomeric moieties, each of which is hydrogen, hydroxyl, carboxyl, aldehyde or C_{1-6} alkyl,

R^7 represents one or more carboxyl groups (COO) or sulfonic acid groups (SO_3X) and

X is hydrogen or an alkali metal cation selected from sodium and potassium; and

(C) either (C.1) coloring the aluminum surfaces by alternating current electrolysis in first bath (A) and subsequently in bath (B) or (C.2) coloring the aluminum surfaces by alternating current electrolysis first in bath (B) and subsequently in bath (A).

5,587,064

WASTE WATER PURIFICATION PROCESS AND APPARATUS

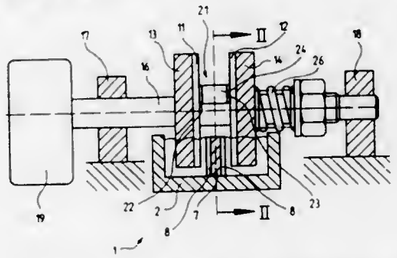
Günther Hambitzer, Pfinztal; Winfried Böke, Karlsruhe, and Armin Oertel, Pfinztal, all of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Germany

Filed Aug. 10, 1995, Ser. No. 513,235

Claims priority, application Germany, Aug. 13, 1994, 44 28 787.9

Int. Cl.[6] C02F *1/461*

U.S. Cl. 205—742 **14 Claims**



1. A method for cleaning wastewater containing heavy metals, which are deposited cathodically, with at least one cathode and at least one anode, a cutting device for mechanically removing the heavy metal deposits on the cathode, the removed deposits being separated form the wastewater, with the at least one cathode and the cutting device being moved relative to one another, with a variable pressure force between the at least one cathode and the cutting device and with a lead dioxide layer on the at least one anode being formed in a self-renewing manner by deposition of lead dioxide from the wastewater on an anode base material, and with the lead dioxide layer on the at least one anode is maintained at a specified thickness.

5,587,065

MOBILE SYSTEM FOR THE COLLECTION, SEPARATION AND DISPOSAL OF WET SOLID, OILY AND/OR WATERY WASTE

Thomas J. Burns, Aurora, Ohio, assignor to H2Oil, Inc., Aurora, Ohio

Filed Mar. 23, 1993, Ser. No. 35,626

Int. Cl.[6] B01D *21/24;21/34*

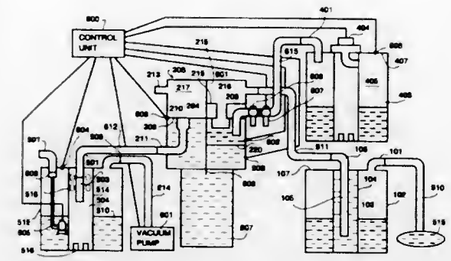
U.S. Cl. 210—104 **19 Claims**

5. A separating and disposal system for handling watery, oily waste, which comprises

(a) first and second fluid chambers disposed generally in a side-by-side arrangement,

(b) means forming a fluid flow connection between lower portions of said fluid chambers,

(c) means forming an air flow connection between upper portions of said fluid chambers,



(d) a fluid inlet means for flowing fluid into the upper portions of said first fluid chamber,

(e) a fluid outlet communicating with said second fluid chamber and being located at a predetermined height therein to establish a predetermined normal liquid level for said first and second chambers,

(f) means in said first fluid chamber for sensing the level of an interface between a layer of oily liquid separated from and supported by water,

(g) a discharge conduit for oily liquid communicating with said first fluid chamber below said normal liquid level for effecting removal of oily liquid from said first fluid chamber,

(h) means for effecting a flow of liquid into said fluid inlet means and out of said fluid outlet, and

(i) control means responsive to said means for sensing for periodically and selectively removing oily liquid from said first fluid chamber.

6. A separating and disposal system according to claim 5, further characterized by

(a) said means for sensing the level of said layer of oily liquid comprising a sensor in said first fluid chamber operative to detect an oil-water interface.

7. A separating and disposal system according to claim 6, further characterized by

(a) a normally closed oil-receiving vessel, connected to said discharge conduit, for receiving oily liquid from said first fluid chamber,

(b) said oil-receiving vessel including sensor means for determining a full condition.

5,587,066

BARREL SHAPED SPRING CENTER TUBE FOR A FLUID FILTER

Edward A. Covington, Gastonia, N.C., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 938,430, Aug. 31, 1992, Pat. No. 5,284,579. This application Feb. 8, 1994, Ser. No. 193,225

Int. Cl.[6] B01D *27/10*

U.S. Cl. 210—130 **20 Claims**

20. A filter unit comprising:

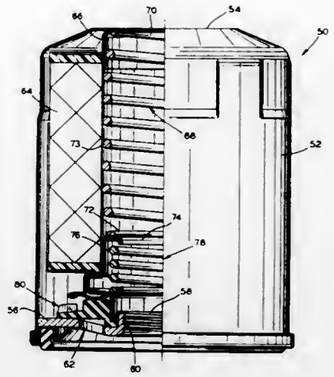
a hollow container having a closed end and an opened end;

a hollow cylindrical filter element disposed within said container;

an end plate supported on said container adjacent said opened end, said end plate having a plurality of fluid inlet ports and a fluid outlet port formed therethrough;

a valve disposed within said container, said valve including an annular housing having a first end, a second end, and an annular flange between said first end and said second end which extends radially outwardly between said filter element and said end plate, said first end of said housing being disposed within said filter element; and

a spring disposed within said container having a first end portion, a central portion, and a second end portion, said spring extending through said filter element and reacting between said closed end of said container and said valve annular housing to urge said valve into engagement with said end



plate, said first end portion of said spring defining an outer diameter which is smaller than an outer diameter defined by said central portion of said spring.

5,587,067

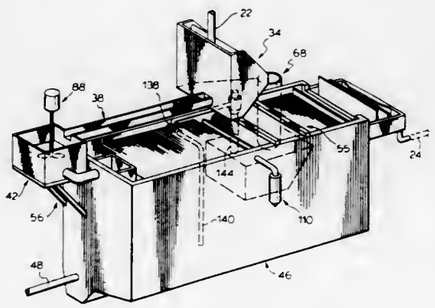
WASTEWATER TREATMENT APPARATUS

Leonard S. Love, Mississauga, Canada, assignor to Sydlo Inc., Mississauga, Canada

Filed Jun. 21, 1995, Ser. No. 493,074

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—155 **14 Claims**



1. A unitary wastewater treatment apparatus having an inlet for raw wastewater and a treated effluent outlet, the apparatus comprising:

a screen filter for receiving raw wastewater from said raw wastewater inlet and removing coarse particles from the wastewater, said screen filter having an outlet;

a flume having an inlet coupled to said outlet, and a discharge;

de-ragging means in said flume;

scum and grit removal means comprising a tank for receiving wastewater from said flume and for containing a body of water to a defined level, said tank having an effluent outlet communicating with said treated effluent outlet of the apparatus, a skimmer for removing scum from the surface of said body of water, pre-aeration means for aerating water in the tank, and grit removal means; and,

chemical mixing means between said flume discharge and said treated effluent outlet of the apparatus.

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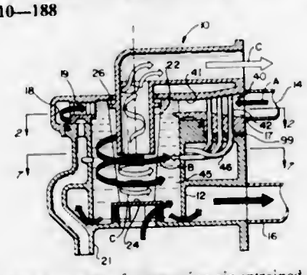
5,587,068

MULTI-ATTITUDE DEAERATOR FOR OIL TANK

Wilho V. Aho, Jr., West Palm Beach; Stephen R. Jones, Tequesta; Gregory E. Chetta, Palm Beach Gardens, and Terry H. Strout, Palm City, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 15, 1994, Ser. No. 340,498
Int. Cl.[6] B01D *19/00;21/26*
U.S. Cl. 210—188 **9 Claims**



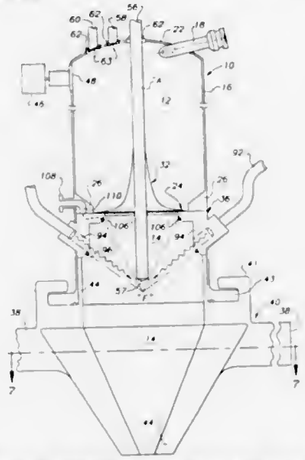
1. A deaerator apparatus for removing air entrained in oil having wall means for defining an enclosed chamber and vortex generating means in said chamber, the air entrained in oil being an air/oil mixture being centrifuged by said vortex generating means to separate the oil and air from the air/oil mixture, an inlet formed in said wall means for admitting the air/oil mixture into said enclosed chamber wherein the oil is directed toward the wall means of said enclosed chamber, an air removal tube extending through said wall means into said enclosed chamber for removing the air, wake separator means disposed in said inlet for creating a wake and removing a portion of the air from said air/oil mixture prior to said air/oil mixture entering said enclosed chamber, and connecting means interconnecting said wake separator means and said air removal tube.

5,587,069

WATER DECONTAMINATION APPARATUS USING PEROXIDE PHOTOLYSIS IONIZER

Wayne F. Downey, Jr., 437 Franklin Ct., Collegeville, Pa. 19426

Continuation-in-part of Ser. No. 111,988, Aug. 25, 1993, Pat. No. 5,439,595. This application Jun. 7, 1995, Ser. No. 480,852
Int. Cl.[6] C02F *1/32*
U.S. Cl. 210—192 **18 Claims**



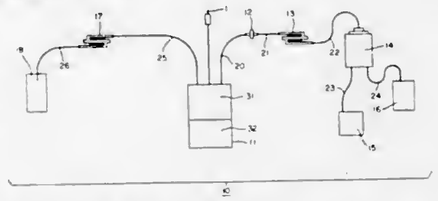
1. For use in the treatment of water, apparatus comprising a first chamber, a water inlet port in fluid communication with said first chamber, a second chamber in fluid communication with said first chamber and having an outlet port, first orifice means in fluid communication with said second chamber for introducing oxidizing reagent into said second chamber, an ultraviolet radiation source operatively coupled to said first and second chambers, said ultraviolet radiation source being disposed to simultaneously irradiate water in said first chamber and water and reagent in said second chamber, and second orifice means for conducting and directing water from said first to said second chamber, said second orifice means directing the water toward a mixing zone, wherein the water and the reagent are mixed in said second chamber and irradiated by ultraviolet radiation from said radiation source.

5,587,070

SYSTEM FOR PROCESSING BIOLOGICAL FLUID

David B. Pall, Roslyn Estates; Thomas C. Gsell; Vlado I. Matkovich, both of Glen Cove, and Thomas Bormann, Seaford, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 788,787, Nov. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 609,654, Nov. 6, 1990, Pat. No. 5,100,564. This application Jun. 4, 1993, Ser. No. 71,495
Int. Cl.[6] B01D *36/00;36/02*
U.S. Cl. 210—202 **32 Claims**



26. A biological fluid processing system comprising:

a first container;

a first porous medium communicating with the first container, said first porous medium comprising a leukocyte depletion medium; and

a separation device downstream of, and communicating with, the first porous medium, said device comprising a housing and including a separation medium;

said housing having an inlet, a first outlet, and a second outlet;

said separation medium having a first surface and a second surface, and comprising at least one porous membrane, said separation medium being suitable for passing a biological fluid including plasma and at least one other component of the biological fluid along the first surface of the separation medium and for passing plasma through the separation medium,

said separation medium positioned inside the housing to provide a first fluid flow path for the biological fluid from the inlet along the first surface of the separation medium to the first outlet, wherein said first fluid flow path includes at least one fluid flow channel which comprises a serpentine flow channel; and a second fluid flow path for passing plasma through the first and second surfaces of the separation medium to the second outlet.

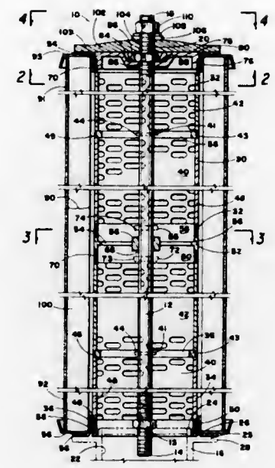
5,587,071

REPLACEABLE ELEMENT FLUID FILTER

Donald E. Belden, Sand Springs, Okla., assignor to Facet International, Inc., Tulsa, Okla.

Division of Ser. No. 58,768, Apr. 13, 1993, Pat. No. 5,423,984. This application Jun. 9, 1995, Ser. No. 488,877
Int. Cl.[6] B01D *29/21;27/08;27/06;35/30*
U.S. Cl. 210—232 **4 Claims**

1. A replaceable element fluid filter comprising:



an elongated rigid apertured center tube comprised of a plurality of tubular sections joined concentrically end-to-end with the joined sections allowing flow communication between adjacent joined tube sections, the center tube having a top and a bottom end;

an elongated rod extending coaxially through said center tube, a bottom end of the rod being secured to a filter attachment means, said filter attachment means having a fluid passageway therethrough, the rod having a top end portion;

a top flange member having a central opening therethrough and a periphery in engagement with and closing said center tube top end, the top flange member central opening receiving said rod therethrough;

a means received on said rod top end portion to secure said top flange member against said center tube and to thereby hold said center tube in communication with said filter attachment means;

a tubular filter element having top and bottom end portions replaceably receivable on said center tube;

means to sealably close said filter element top and bottom end portions and for providing closed communication between said tubular filter element and said filter attachment means fluid passageway;

a yoke member received on the top end portion of said rod and having an outer peripheral area sealably engaging said means to sealably close said filter element top end portion; and

means received on said rod adjacent to said top end thereof to retain said yoke whereby said yoke member may be removed to replace said filter element without disturbing said center tube, whereby by varying the number of said plurality of apertured center tube tubular sections and the length of said rod, said tubular filter elements of different length may be employed.

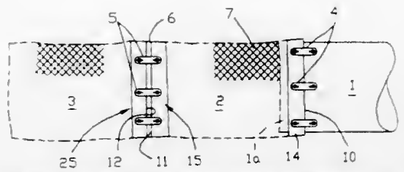
5,587,072

STORM SEWER OUTLET FILTER

Francis A. Regan, 211 Ardmore Ave., Ardmore, Pa. 19003

Filed Oct. 10, 1995, Ser. No. 541,619
Int. Cl.[6] B01D *35/02*
U.S. Cl. 210—232 **11 Claims**

1. A filter device to be connected to the outlet of a storm sewer to receive the flow of water and debris carried by the water which exits from the outlet, the filter functioning for allowing the water to pass therethru while retaining debris carried by the water, the filter device comprising:



first filter means including an elongated, hollow member made of netting and having a water/debris entrance end and also having a water/debris exit end, the netting being open to pass water therethrough;

first connector means mounted on said netting and extending around said entrance end;

mechanism mounted on said first connector means for use in connecting the entrance end to a storm sewer outlet;

second connector means mounted on said netting and extending around said exit end;

mechanism mounted on said second connector means for use in connecting the exit end to an adjacent filter means;

second filter means including an elongated, hollow member made of netting and having a water/debris entrance end, the netting being open to pass water therethrough and

also having an opposite closed end;

third connector means mounted on said netting of said second filter means and extending around the entrance end of said second filter means;

mechanism mounted on said third connector means for use in connecting last said entrance end to the exit end of said first filter means; and

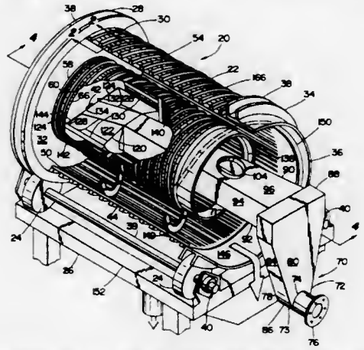
a plurality of releasable, reusable fastener means respectively engaging said mechanism or said exit end of said first filter means; and said mechanism on said entrance end of said second filter means and releasably securing the first and second filter means together with the ends of said second and third connector means adjacent to and facing one another and constituting a joint.

5,587,073

END SUPPORTED DOUBLE DRUM WASTE WATER SCREEN

David R. Zittel, 155 Oak Grove Dr., Columbus, Wis. 53925

Continuation of Ser. No. 121,730, Sep. 15, 1993, Pat. No. 5,433,849. This application Jun. 7, 1995, Ser. No. 477,085
Int. Cl.[6] B01D *33/067;33/11;33/42;33/72*
U.S. Cl. 210—372 **11 Claims**



1. An apparatus for filtering particulate matter from water, the apparatus comprising:

a) a frame;

b) an outer drum rotatably mounted to the frame, the outer drum having portions defining a drum head and a generally cylindrical perforated screen extending from the drum head which

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allows the passage of water therethrough but which retains particulate matter above a first size;

c) an inner drum mounted in cantilever supported engagement to the drum head inside of the outer drum and thus mounted to co-rotate with the outer drum, the inner drum having portions defining a generally cylindrical perforated screen which allows the passage of water therethrough but which retains particulate mater above a second size, wherein the second size is greater than the first size;

d) means mounted on the interior of the outer drum for advancing particulate matter retained by the outer drum screen to a discharge opening of the outer drum;

e) means mounted on the interior of the inner drum for advancing particulate matter retained by the inner drum screen to an inner drum discharge opening; and

f) a conduit which discharges waste water containing particulate matter into the interior of the inner drum, whereby the water passes through the perforated screen of the inner drum and through the perforated screen of the outer drum, to yield a treated water flow which has reduced levels of particulate matter.

5,587,074

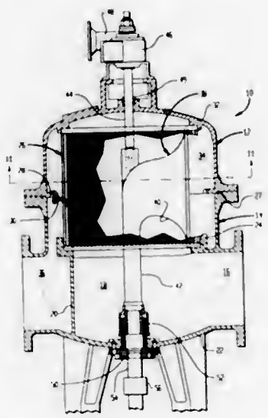
FLUID FILTER WITH ENHANCED BACKFLUSH FLOW

Gerard J. Lynch, Bridgewater, and Joseph Quinn, Kearny, both of N.J., assignors to H-Tech, Inc., Del.

Filed Feb. 17, 1995, Ser. No. 390,134

Int. Cl.[6] B01D *29/68*

U.S. Cl. 210—411 **7 Claims**



1. A backflush conduit for an automatic backflushing filter, comprising:

a) a flared inlet portion converging inwardly from an inlet aperture in the direction of backflushing flow;

b) an outlet portion having a generally cylindrical shape and oriented at an angle with respect to said inlet portion; and

c) a transition portion connecting said inlet portion and said outlet portion, said transition portion turning through said angle while converging to said outlet portion, said inlet portion having an interior with upper and lower walls, said upper and lower walls being symmetrical and convex relative to each other and converging in the direction of backflushing flow through said conduit toward said transition portion, said conduit having a streamlined interior contour to enhance fluid flow therethrough and supporting a substantially even rate of fluid flow across said inlet aperture.

5,587,075

PRESSURE FILTER

Uwe Maurer, Schwelm, Germany, assignor to Mike Maurer, Schwelm, Germany

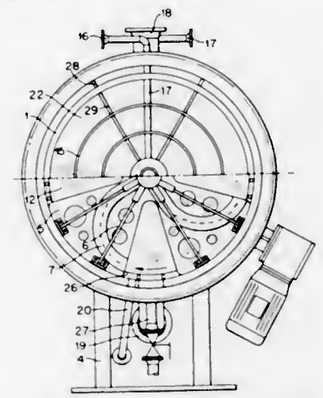
PCT No. PCT/DE94/00795, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO95/00229, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 21, 1994, Ser. No. 392,770

Claims priority, application Germany, Jun. 24, 1993, 43 20 951.3

Int. Cl.[6] B01D *29/68*

U.S. Cl. 210—411 **7 Claims**



1. A pressure filter comprising a fluid compartment with a fluid inlet, at least one filter surface in the fluid compartment having a plurality of apertures, one side of the filter surface being restricted by the fluid compartment and the other side thereof being restricted by a filtrate compartment having a filtrate outlet, and a backwashing means with a backwashing head sweeping over the filter surface and sealing a part of the filter surface with respect to the fluid compartment, the backwashing head restricting a backwashing compartment having at least one suction chamber open in a slot-like manner to the filter surface and having connected thereto a reject drain, wherein the slot-like aperture of the suction chamber is formed as a semi-arc of a helix of about 190° and in such a manner that each aperture of the filter surface, independent of its radial position, is swept over by the slot-like aperture in approximately the same space of time.

5,587,076

FILTER NOZZLE FOR INJECTION MOLDING MACHINES PROCESSING THERMOPLASTICS

Kurt Herzog, Wattwil, Switzerland, assignor to Herzog AG, Wolfertswil, Switzerland

Filed May 19, 1995, Ser. No. 446,011

Claims priority, application Switzerland, May 25, 1994, 1613/94

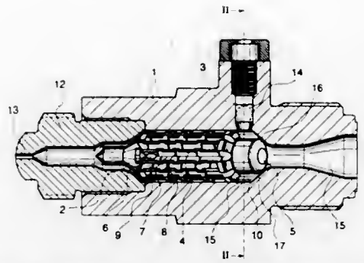
Int. Cl.[6] B01D *35/02*

U.S. Cl. 210—461 **13 Claims**

1. A filter nozzle for thermoplastic injection molding machines, the nozzle comprising:

a nozzle body defining an inlet opening, an outlet opening and a passage between said inlet opening and said outlet opening, said nozzle body also defining a flushing opening communicating with said passage;

a filter positioned in said passage in an area adjacent said flushing opening, said filter including partition means for blocking contaminants from flowing through said filter, said filter and said nozzle body providing a path from an upstream side of said partition means to said flushing opening, said path not passing through said partition means;



means for opening and closing said flushing opening to remove contaminants from upstream of said filter.

a generally hollow main body having a top and a bottom and a side wall having at least a portion thereof with a generally decreasing conical taper from the top toward the bottom thereof, and having a tangential inlet in said side wall near said body top for introducing fiber suspension to be cleaned;

a vortex finder located in said body top;

a bottom outlet nozzle located at said bottom of said main body, substantially concentric with said vortex finder; and

a turbulence generator disposed in said tangential inlet for generating sufficient turbulence so as to break up fiber flocs in introduced suspension and prevent reformation of the flocs before the suspension enters said hollow main body, so as to enhance cleaning efficiency of the cleaner, increase the consistency of fiber suspension which the cleaner can effectively handle, and/or minimize the sensitivity of the cleaner cleaning efficiency to consistency changes in the fiber suspension compared to the same cleaner but not including said turbulence generator.

5,587,077

SCREEN CYLINDER OR PLATE HAVING A GROOVED FIRST FACE AND A STEPLESS SECOND FACE

Frank Aaltonen, Lisse, Netherlands, and Timo Alajaaski, Kotka, Finland, assignors to CAE Investments B.V., Eygelshoven, Netherlands

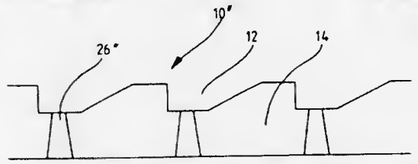
PCT No. PCT/FI92/00263, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/07384, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 30, 1992, Ser. No. 211,403

Claims priority, application Finland, Oct. 4, 1991, 914703

Int. Cl.[6] B01D *39/10*

U.S. Cl. 210—498 **30 Claims**



1. A method of producing a screen cylinder or plate from a piece of material having first and second opposed substantially parallel faces, comprising the steps of:

(a) forming a plurality of grooves associated with the first face, each groove having a lowermost portion closest to the second face; and

(b) from the second face, in a single working phase, forming stepless, continuous surface through-extending apertures in the material, the apertures cooperating with the grooves.

5,587,078

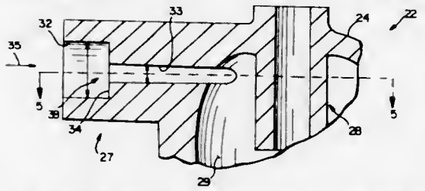
CENTRIFUGAL CLEANER

Peter LeBlanc, Queensbury, N.Y., assignor to Ahlstrom Machinery Corporation, Noormarkku, Finland

Filed Apr. 1, 1994, Ser. No. 221,004

Int. Cl.[6] B01D *21/26*

U.S. Cl. 210—512.1 **26 Claims**



1. A centrifugal cleaner for fiber suspensions having fiber flocs therein, comprising:

5,587,079

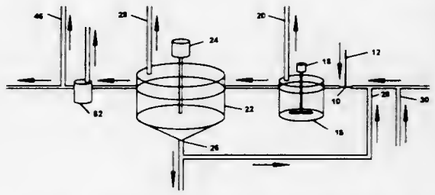
PROCESS FOR TREATING SOLUTIONS CONTAINING SULFATE AND METAL IONS.

Michael V. Rowley; Douglas D. Warkentin, both of 930 West 49th Avenue, Vancouver, B.C., V5Z 2S9, Canada, and Beverly M. Piroshco, 3913 West 24th Avenue, Vancouver, B.C., V6S 1M1, Canada

Filed Apr. 21, 1995, Ser. No. 426,802

Int. Cl.[6] C02F *3/30*

U.S. Cl. 210—603 **29 Claims**



1. A process for treating a solution containing sulfate ions and metal ions, comprising the steps of:

(a) adding hydrogen sulfide to the solution;

(b) precipitating a sulfide of the metal ions from the solution;

(c) feeding a portion of the solution to an anaerobic microbiological culture that utilizes the sulfate ions and produces hydrogen sulfide;

(d) feeding the anaerobic microbiological culture gaseous nutrients comprising hydrogen and a carbon oxide, the gaseous nutrients being produced by a partial oxidation burner;

(e) stripping hydrogen sulfide produced by the microbiological culture from the solution; and,

(f) recirculating a portion of the hydrogen sulfide stripped from the solution in step (e) to be used in step (a).

5,587,080

FERMENTATION PROCESS

Robert Landine; Claude De Garie, and Albert Cocci, all of Fredericton, Canada, assignors to ADI, Limited, Canada Division of Ser. No. 94,118, Sep. 22, 1993, Pat. No. 5,505,848. This application Dec. 11, 1995, Ser. No. 570,690

Int. Cl.[6] C02F *3/28*

U.S. Cl. 210—603 **8 Claims**

1. A method of treating a liquid effluent by fermentation, comprising; positioning a gas collection conduit around at least part of the periphery of an effluent container; positioning a gas-impermeable cover of said effluent container; pumping effluent into said container for fermentation therein; collecting gas emanating

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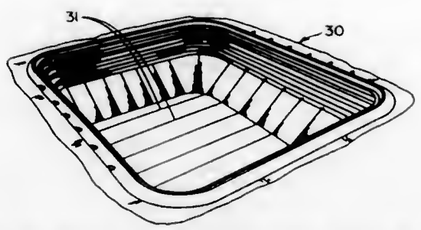
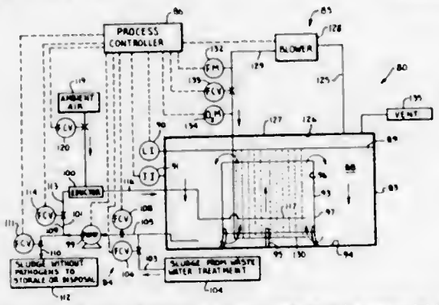


from said effluent into said gas collection conduit; extracting said gas from said conduit; and removing clarified liquor from said container.

5,587,081
THERMOPHILIC AEROBIC WASTE TREATMENT PROCESS
Kenneth L. Norcross, and Yanlong Li, both of Edwardsville, Kans., assignors to Jet-Tech, Inc., Edwardsville, Kans.
Filed Apr. 26, 1994, Ser. No. 233,276
Int. Cl.[6] C02F *11/06*
U.S. Cl. 210—604 **13 Claims**



1. A method of destroying pathogenic organisms in a material by exposing the organisms to an aerobic and thermophilic environment, comprising the steps of:

a) placing the material in a reactor;

b) flowing oxygen-containing gas upward through the material; and

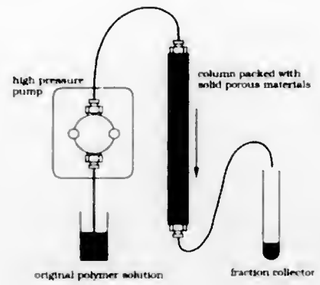
c) providing a blower mechanism for recycling at least a portion of the gas that has previously flowed through the material back through the material as recycle.

5,587,082
HIGH OSMOTIC PRESSURE CHROMATOGRAPHY
Iwao Teranka, 73 Batavia Pl., Harrison, N.Y. 10528, and Min Luo, 229 W. 62nd St., New York, N.Y. 10023
Filed Jun. 7, 1995, Ser. No. 480,238
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—635 **21 Claims**

1. A method for fractionating polymers based on molecular size comprising the steps of:

(A) providing a solution of polymer dissolved in a first solvent, said polymer having an initial polydispersity index greater than 1.000 and including higher and lower molecular weight polymer components, said polymer being dissolved in said first solvent at a concentration about equal to or greater than an overlap concentration, c*, of said polymer but less than a concentration at which said solution is no longer fluid,

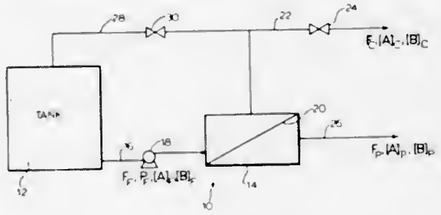
(B) passing said solution as a mobile phase through a chromatographic matrix to generate an eluent, said matrix including a



porous material imbibed with a second solvent, said second solvent imbibed in said porous material acting as a stationary phase in communication with said mobile phase, said porous material having pore openings of a dimension on the order of a molecular size of said polymer that allows said lower and higher molecular weight polymer components to migrate selectively between said mobile phase and said stationary phase to effect size-based partitioning of said polymer, whereby said migration is enhanced by a relatively high osmotic pressure generated because said concentration is about equal to or greater than said overlap concentration, c*, and

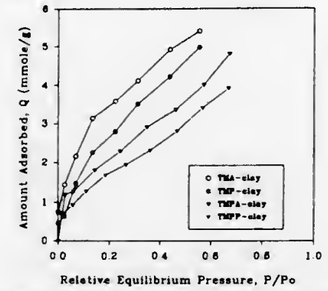
(C) eluting said polymer from said porous material.

5,587,083
NANOFILTRATION OF CONCENTRATED AQUEOUS SALT SOLUTIONS
Zbigniew Twardowski, Burnaby, Canada, assignor to Chemetics International Company Ltd., Vancouver, Canada
Filed Apr. 17, 1995, Ser. No. 422,935
Int. Cl.[6] B01D *61/00*
U.S. Cl. 210—652 **12 Claims**



1. In a nanofiltration process for filtering an aqueous liquor comprising feeding a feed liquor to a nanofiltration membrane module under a positive applied pressure to provide a pass liquor and a permeate liquor and selectively decreasing the concentration of a first compound relative to the concentration of a second compound in said aqueous liquor wherein said first compound has a first feed concentration and said second compound has a second feed concentration, said process comprising feeding said aqueous liquor to said nanofiltration membrane module, collecting said pass liquor wherein said first compound is at a first pass concentration lower than said first feed concentration, and said second compound is at a second pass concentration higher than said second feed concentration, and collecting said permeate liquor wherein said first compound has a first permeate concentration and said second compound is at a second permeate concentration, the improvement wherein said first feed compound has a first feed concentration greater than 50 g/l, wherein said first feed compound contains monovalent ions, and said second feed compound contains polyvalent ions.

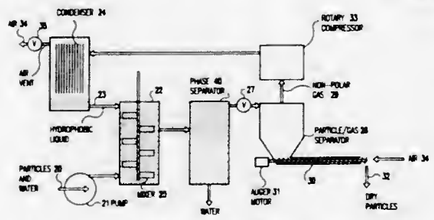
5,587,084
METHOD OF REMOVING ORGANIC CONTAMINANTS FROM AIR AND WATER WITH ORGANOPHILIC, QUATERNARY PHOSPHONIUM ION-EXCHANGED SMECTITE CLAYS
Stephen A. Boyd, and Ravi Kukkadapu, both of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.
Filed Feb. 7, 1995, Ser. No. 384,967
Int. Cl.[6] C02F *1/28;1/42*
U.S. Cl. 210—691 **9 Claims**



1. A method of adsorbing an organic compound from air or water comprising contacting the organic compound in the air or water with a quaternary phosphonium ion-exchanged colloidal clay including a quaternary phosphonium ion-exchanged cation of the formula:

wherein X^- is selected from the group consisting of Cl^-, Br^- and I^-; wherein R_1, R_2, R_3 and R_4 are organic moieties selected from the group consisting of short chain alkyl moieties (C_1–C_4); long chain alkyl moieties (C_4–C_{20}); substituted alkyl moieties having 1 to about 20 carbon atoms; substituted or unsubstituted cyclo-alkyl moieties; substituted or unsubstituted aryl moieties; substituted or unsubstituted alkaryl moieties; alkenes; alkynes; aldehydes; ketones; alcohols; carboxylic acids; esters; ethers; cyclic ethers; and combinations thereof.

5,587,085
METHOD FOR DEWATERING PARTICLES
Roe-Hoan Yoon, and Gerald H. Luttrell, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Property Inc., Blacksburg, Va.
Continuation-in-part of Ser. No. 229,012, Apr. 18, 1994, Pat. No. 5,458,786. This application Jun. 7, 1995, Ser. No. 476,513
Int. Cl.[6] C02F *1/54*
U.S. Cl. 210—711 **5 Claims**



1. A method for dewatering hydrophobic particles, comprising the steps of:

adding to a mixture comprised of water and hydrophobic particles, a quantity of at least one hydrophobic compound which is in a gaseous state under atmospheric pressure and in liquid state at higher pressures, said hydrophobic compound being under pressure and in said liquid state during said adding step, said quantity of said hydrophobic compound being sufficient to displace water from surfaces of said hydropbobic particles;

spontaneously displacing water from said surfaces of said hydrophobic particles while said hydrophobic compound is in its liquid state;

separating said hydrophobic compound and said hydrophobic particles from said water by the substeps of:

floating said hydrophobic compound and said hydrophobic particles on top of said water, and

recovering a binary composition of said hydrophobic compound and said hydrophobic particles from said mixture;

reducing said pressure of said binary composition to cause said hydrophobic compound to change to said gaseous state and separate from said hydrophobic particles;

collecting dried hydrophobic particles after said step of reducing pressure; and

recycling said hydrophobic compound for use in said adding a step.

5,587,086
PURIFICATION OF AQUEOUS MEDIA USING ALUMINUM POLYCHLORIDE/IRON COMPOUND/SALT-BASED COAGULANT COMPOSITIONS
Sylvain Danda, Marly la Ville; Magnus Kvant, Niederroedern, and Yvette Pescher, Bagneux, all of France, assignors to Kemrhone France, Courbevole Cedex, France
Division of Ser. No. 248,178, May 24, 1994. This application Jun. 2, 1995, Ser. No. 458,698
Claims priority, application France, May 24, 1909, 93 06159
Int. Cl.[6] C02F *1/52;1/56*
U.S. Cl. 210—723 **11 Claims**

1. In a process of the treatment/purification of an impure aqueous medium by contacting same with a coagulating agent and thence permitting particulate impurities therein to settle, the improvement which comprises using, as the coagulant therefor, a coagulant composition, comprising (i) at least one basic aluminum polychloride or polychlorosulfate, (ii) at least one iron (II) and/or iron (III) compound, and (iii) at least one alkali metal and/or alkaline earth metal halide wherein said at least one basic aluminum polychloride or polychlorosulfate has the general formula:

$$[Al_n(OH)_mCl3_{n-m-2k}(SO_4)_k][H_4O]_z$$

in which n, m and k are positive numbers; 3n-m-k is positive; z is a positive integer at least equal to 1; and k is a number ranging from 0 to 0.4×n, and wherein said basic aluminum polychloride or polychlorosulfate has a (m/3n)×100 ratio of from 10% to 80%.

5,587,087
METHOD AND APPARATUS FOR TREATING LIQUIDS
Alban Timmons, 7 Cartwright La. Beverley, North Humberside, Great Britain
PCT No. PCT/GB94/01771, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO95/05345, PCT Pub. Date Feb. 23, 1995
PCT Filed Aug. 12, 1994, Ser. No. 416,852
Claims priority, application United Kingdom, Aug. 16, 1993, 9317026
Int. Cl.[6] C02F *1/66*
U.S. Cl. 210—724 **31 Claims**

1. A method for treating a contaminated liquid in a first vessel comprising a light contaminants outlet through which light contaminants can be extracted in upper regions of the vessel and a heavy contaminants outlet through which heavy contaminants can be extracted in lower regions of the vessel and a mid-height outlet

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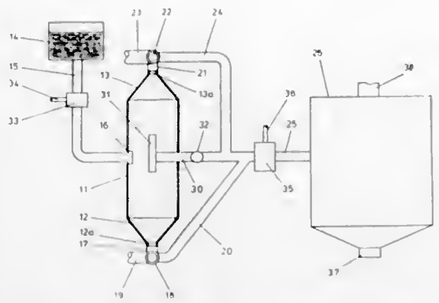


in a mid-height region of the vessel, said mid-height outlet comprising a vertical duct open at both ends and having its axis concentric with the axis of the vessel comprising the steps of adding to the contaminated liquid a first treatment material selected from the group consisting of soluble magnesium salts, ferrous salts, manganous compounds, cuprous compounds, and nickel II, intimately mixing the first treatment material into the contaminated liquid and then raising the pH of the contaminated liquid to a value in excess of 8, and separating clarified liquid from the contaminant.

5,587,088

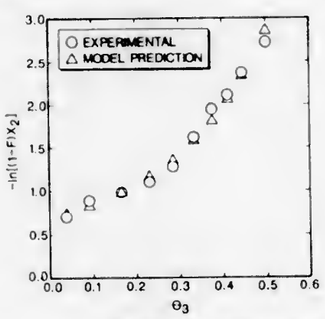
PRECIPITATION AND SEPARATION OF INORGANIC SPECIES FROM AQUEOUS SOLUTIONS

Mansour S. Bader, P.O. Box 1901, Stillwater, Okla. 74074

Filed Aug. 1, 1995, Ser. No. 509,781

Int. Cl.[6] C02F *1/58; 1/62*

U.S. Cl. 210—729 **18 Claims**



Precipitation of Calcium Chloride by Isopropylamine

1. A method of removing salt from an aqueous solution comprising said salt and water, said method comprising the step of adding an effective amount of isopropylamine to said solution to cause at least a portion of said salt to form a solid precipitate, wherein said salt is selected from the group consisting of: chlorides of calcium, barium, strontium, and radium; bicarbonates of sodium, potassium, magnesium, calcium, barium, strontium, and radium; silicates of sodium, potassium, magnesium, and radium; selenites, selenates and selenides of sodium, potassium, magnesium, calcium, barium, strontium, and radium; phosphorous selenide salts selected from phosphorous sub-selenide, phosphorous mono-selenide, phosphorous tri-selenide, and phosphorous penta-selenide; selenium halide salts selected from selenium mono-chloride, selenium tetra-chloride, selenium mono-bromide, and selenium tetra-bromide; bromides, nitrates, nitrites, and phosphates of sodium, potassium, magnesium, calcium, barium, strontium, and radium; and combinations thereof.

5,587,089

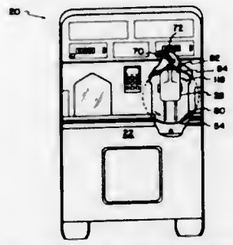
WATER PURIFICATION AND DISPENSING SYSTEM

Gerald A. Vogel, Willmar, and Joseph H. Tholen, Waconia, both of Minn., assignors to J. Vogel Premium Water, St. Cloud, Minn.

Filed Jul. 8, 1994, Ser. No. 272,784

Int. Cl.[6] B01D *17/12*

U.S. Cl. 210—164 **23 Claims**



8. A process for purifying and dispensing water comprising the steps of:

a) obtaining unpurified water from a supply source and purifying the unpurified water in an apparatus including a water purification system;

b) placing a container in the apparatus in an upright position in a container rotating means;

c) rotating the container to an inverted position;

d) directing the purified water from the water purification system into the container when the container is in the inverted position;

e) rotating the container to an upright position; and

f) directing the purified water from the water purification system into the container for filling the container in the upright position.

11. The process of claim 8 additionally comprising, ozonating the purified water in the apparatus.

5,587,090

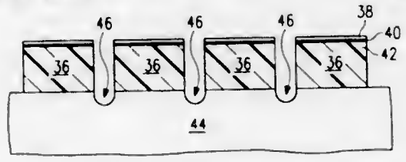
MULTIPLE LEVEL MASK FOR PATTERNING OF CERAMIC MATERIALS

James F. Belcher, Plano; Steven N. Frank, McKinney; John P. Long, Garland, and Jeaneé Jones, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1994, Ser. No. 222,146

Int. Cl.[6] B44C *1/22;* **C03C** *15/00*

U.S. Cl. 216—17 **12 Claims**



1. A method of forming a microelectronic structure, said method comprising steps:

(a) providing a ceramic substrate;

(b) chemical vapor depositing a parylene mask layer on said ceramic substrate;

(c) forming a dry-etch-selective mask layer on said parylene mask layer, said dry-etch-selective mask layer comprising a different material than said parylene mask layer;

(d) forming a top photosensitive layer on said dry-etch-selective mask layer, said top photosensitive layer comprising a different material than said dry-etch-selective mask layer;

(e) forming a pattern in said top photosensitive layer using photolithography;

(f) forming said pattern in said dry-etch-selective mask layer using said top photosensitive layer as a first etch mask;

(g) forming said pattern in said parylene mask layer using said dry-etch-selective mask layer as a second etch mask, said parylene mask layer having vertical walls; and

(h) ion milling said pattern in said ceramic substrate using said parylene mask layer as a third etch mask, whereby the vertical walls of the parylene mask layer allow vertical walls and/or deep trenches to be formed in the ceramic substrate.

5,587,091

METHOD AND APPARATUS FOR CONTROLLING RESISTANCE WELDING

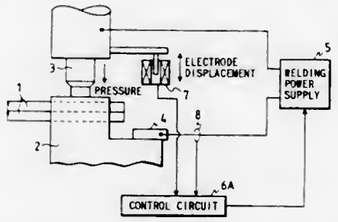
Tadashi Kawagoe, Hekinan, and Keizo Zyouko, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 20, 1995, Ser. No. 426,979

Claims priority, application Japan, Apr. 20, 1994, 6-081651

Int. Cl.[6] B23K *11/24*

U.S. Cl. 219—110 **6 Claims**



1. A control apparatus for resistance welding, comprising:

time measuring means for measuring an energization time of a welding current, the energization time being required by a given electrode displacement during welding between an electrical conductive weld member and a member to be welded which are arranged between two electrodes;

time difference calculating means for calculating a time difference between the energization time measured by the time measuring means and a preset target energization time; and

feedback control means for correctively increasing and decreasing a welding current, which occurs at a next weld timing, on the basis of the time difference calculated by the time difference calculating means.

5,587,092

METHOD OF WELDING VANES INTO A SHELL FOR A TORQUE CONVERTER

Chris Sullivan, Warren; Jim Wells, Sterling Heights, and Michael Prevost, Ypsilanti, all of Mich., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

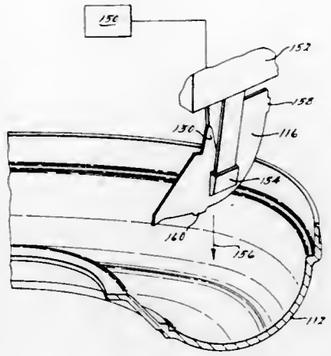
Filed May 2, 1995, Ser. No. 433,947

Int. Cl.[6] B23K *11/26*

U.S. Cl. 219—113 **10 Claims**

1. A method for assembly of a vane into a turbine or impeller for a torque converter, substantially without vane deformation due to heat, comprising:

providing a shell, for an impeller or a turbine, and a vane for insertion into said shell in a predetermined orientation; and, using a high energy pulse from a capacitance discharge welding apparatus for welding of the vane into said shell, without heat deformation of the vane.



5,587,093

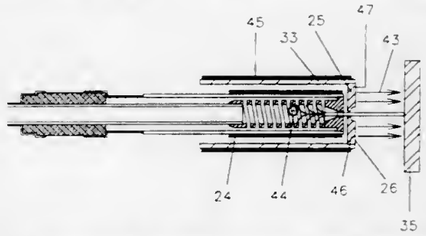
SAFE POTENTIAL ARC CHANNEL ENHANCED ARC HEAD

Graeme Aston, Monument, Colo., assignor to Electric Propulsion Laboratory, Inc., Monument, Colo.

Filed Jun. 2, 1995, Ser. No. 459,332

Int. Cl.[6] B23K *10/00*

U.S. Cl. 219—121.48 **23 Claims**



1. A safe potential arc channel enhanced arc head comprising:

means for introducing a gas flow ionizable to produce a plasma, the gas flowing from a location generally at an upstream end of the arc head into an electrically conducting gas inlet and input current tube coaxially assembled to a generally tubular, electrically conducting insert heater orifice plate;

means for aligning the gas inlet and input current tube and the insert heater orifice plate to share a common axis aligned with the direction of gas flow, the insert heater orifice plate having an orifice therein through which the gas flow exits the arc head;

means for forming a joint at a downstream end of the insert heater orifice plate and a downstream end of an electrically conducting body and return current tube;

a tube coupler electrical insulator generally tubular in shape and means for attaching an upstream end of the body and return current tube to the downstream end of the tube coupler electrical insulator and for attaching an upstream end of the tube coupler electrical insulator to an upstream end of the gas inlet and input current tube;

means for aligning the tube coupler electrical insulator and the body and return current tube to share a common axis, the common axis being coaxial with the common axis of the gas inlet and input current tube and the insert heater orifice plate which are contained wholly within, and electrically isolated from, an inside diameter of the tube coupler electrical insulator and the body and return current tube except at the joint between the insert heater orifice plate and the body and return current tube;

means for establishing a potential difference between an upstream end of the gas inlet and input current tube and an upstream end of the body and return current tube to produce a heater current flow in a path from the upstream end of the gas

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inlet and input current tube, through the insert heater orifice plate, and through the body and return current tube to the upstream end of the body and return current tube;

resistance means for making an Ohmic resistance integral to the insert heater orifice plate at least three times higher than an Ohmic resistance of the current path through the gas inlet and input current tube and the body and return current tube, said resistance means comprising one or more helixes, each with a multiplicity of turns, generally located between an interface between the gas inlet and input current tube and an upstream end of the insert heater orifice plate, the insert heater orifice plate comprising porous tungsten, having a density within the range 70%–90%, and the one or more helixes being impregnated with a low electronic work function emissive mix material;

first power supply means for providing variable control of a heater current to enable heating the one or more helixes to a temperature of at least 1100 degrees C. for normal arc head operation and to a higher temperature for rapid arc head start-up and self-cleaning;

thermal insulation positioned outside of the body and return current tube from a location at a downstream end of the insert heater orifice plate to a location generally at the upstream end of the insert heater orifice plate.

5,587,094

LASER MARKING APPARATUS

Koji Yoshida, Hiratsuka, Japan; Taku Yamazaki, Pittsburgh, Pa., and Akira Mori, Chigasaki, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

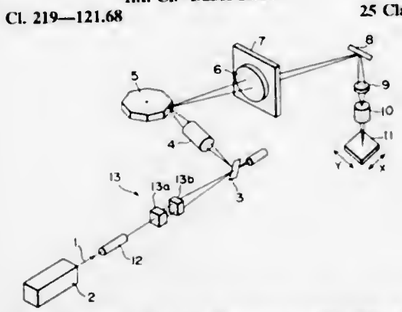
PCT No. PCT/JP93/01717, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO94/12309, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 24, 1993, Ser. No. 433,416

Claims priority, application Japan, Nov. 25, 1992, 4-086578

Int. Cl.[6] B23K *26/06*

U.S. Cl. 219—121.68 **25 Claims**



1. In a laser marking apparatus for passing a laser beam along a beam path from a laser beam source through a raster-scanning system onto a marking surface, said raster-scanning system comprising:

an X-direction polarizing mirror,

a Y-direction polarizing mirror,

a field lens, and

a mask,

wherein said X-direction polarizing mirror, said Y-direction polarizing mirror, said field lens, and said mask are arranged along said beam path so that said laser beam is reflected by each of said X-direction polarizing mirror and said Y-direction polarizing mirror and passes through each of said field lens and said mask,

wherein one of said X-direction polarizing mirror and said Y-direction polarizing mirror is upstream of the other one of said X-direction polarizing mirror and said Y-direction polarizing mirror, with respect to passage of said laser beam along said beam path;

the improvement comprising:

a double polarizing element for branching said laser beam from said laser beam source into two branch beams, said double polarizing element comprising two polarizing prisms arranged in series, with respect to passage of said laser beam along said beam path, at a position in said beam path between said laser beam source and the upstream one of said X-direction polarizing mirror and said Y-direction polarizing mirror, said two polarizing prisms being spaced apart from each other so that there is a distance between the two polarizing prisms along said beam path; and

an adjusting means for varying said distance between the two polarizing prisms.

5,587,095

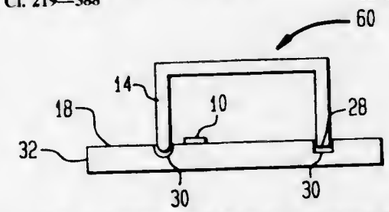
PROCESS AND APPARATUS FOR CONTAMINATION-FREE PROCESSING OF SEMICONDUCTOR PARTS

Nunzio DiPaolo, Poughkeepsie, and Daniel J. Ferguson, Marlboro, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 227,937, Apr. 15, 1994, Pat. No. 5,471,033. This application Aug. 22, 1995, Ser. No. 518,054

Int. Cl.[6] F27B *9/06*

U.S. Cl. 219—388 **12 Claims**



1. A process for treating a part in a second environment wherein said part is protected from said second environment, comprising the steps of:

(a) placing said part on a part carrier in a first environment,

(b) placing a cover over said part carrier such that said cover entraps material from said first environment while enveloping said part to form a covered boat,

(c) removing said boat from said first environment, and

(d) placing said boat in said second environment for treating said part wherein said second environment has more contamination than said first environment.

5,587,096

DE-LABELLING FOR REMOVING APPARATUS LABELS ADHERED TO A DISKETTE UTILIZING OPPOSED HEATERS

Gary S. Huvard, 7819 Tochester Dr., Chesterfield, Va. 23832, and Alfred D. Lobo, 2655 Euclid Heights Blvd., Cleveland Heights, Ohio 44106

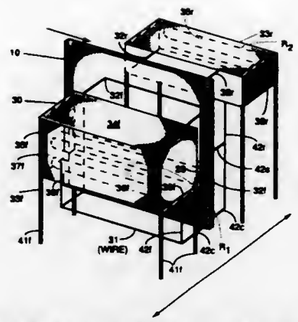
Division of Ser. No. 39,895, Mar. 30, 1993, Pat. No. 5,378,300. This application Dec. 21, 1994, Ser. No. 361,060

Int. Cl.[6] B32B *35/00;* **H05B** *1/00*

U.S. Cl. 219—521 **10 Claims**

1. A device for heating a label of laminar imprintable material, prior to removal thereof from a surface of a standard diskette to which said label is non-removably adhered with a thin layer of adhesive, said diskette having front and rear generally laminar sidewalls which define a casing, in which is non-removably captured a storage disk protected by opposed planar foam pads within said casing; a front label portion extending over at least about 60% of said front sidewall; a rear label portion extending over about 15% of said rear sidewall; said label being adhesively secured to at least said front label portion, said device comprising,

(a) support means to receive and support a diskette in a desired position;



(b) opposed first and second heating means mounted in desired spaced-apart relationship with each other and a diskette therebetween supported in a vertical plane delimited by a pair of opposed biasing means adapted to maintain surfaces of the diskette which are not heated, open to the atmosphere, at least said first heating means providing direct heat energy in a heating zone over said front label portion, said first and second heating means are adapted to direct heat energy over substantially only an area coextensive with the front and rear label portions, respectively, together providing sufficient heat energy to heat said adhesive to a temperature within a range in which said adhesive undergoes thermal viscous deformation; and,

(c) control means including (i) a timer element to provide a predetermined duration of current of requisite amperage and continuous voltage to at least said first heating means, (ii) a starting switch means, and (iii) a signal means recognizable by human senses, said control means being connected to at least said first heating means.

5,587,097

FIXING HEATER AND METHOD OF MANUFACTURING FIXING HEATER

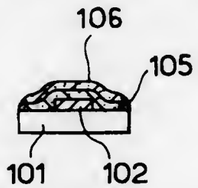
Shigehiro Sato, Yokohama; Yoshiyuki Matsunaga, Yokosuka; Tsuyoshi Ono, Tokyo, and Takaaki Karube, Yokohama, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Continuation of Ser. No. 987,600, Dec. 9, 1992, abandoned. This application Jul. 13, 1994, Ser. No. 274,367

Claims priority, application Japan, Dec. 9, 1991, 3-324791; Feb. 27, 1992, 4-041327; Mar. 31, 1992, 4-108733

Int. Cl.[6] H05B *3/16*

U.S. Cl. 219—543 **8 Claims**



1. A fixing heater comprising:

a substrate having an electrically insulative property;

an electrical resistance member including a heat generating portion formed on the substrate and extending in a longitudinal direction thereof, said heat generating portion having a pair of edge portions one of which is trimmed along the longitudinal direction;

electrode forming portions formed at both longitudinal end portions of the electrical resistance member; and

at least two glass layers formed on a surface of the heat generating portion of the electrical resistance member, said at least two glass layers including a lowermost glass layer and an uppermost glass layer, said lowermost glass layer contacting the surface of the heat generating portion and having an electrical insulation effect higher than that of the uppermost glass layer, said lowermost glass layer also having a surface smoothness lower than that of the uppermost glass layer.

5,587,098

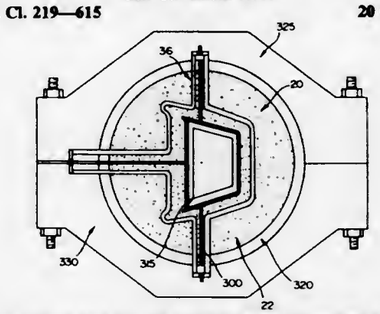
JOINING LARGE STRUCTURES USING LOCALIZED INDUCTION HEATING

Marc R. Matsen, Seattle; Richard J. Poel, Kent; Wesley B. Crow, and David S. Nansen, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 169,655, Dec. 16, 1993, Ser. No. 92,050, Jul. 15, 1993, Pat. No. 5,410,133, and Ser. No. 151,433, Nov. 12, 1993, Pat. No. 5,420,400, said Ser. No. 169,655is a continuation-in-part of Ser. No. 777,739, Oct. 15, 1991, Pat. No. 5,410,132, said Ser. No. 92,050is a division of Ser. No. 681,004, Apr. 5, 1991, Pat. No. 5,229,562. This application Jun. 7, 1995, Ser. No. 481,094

Int. Cl.[6] B23K *13/01*

U.S. Cl. 219—615 **20 Claims**



1. A method for joining large metal aerospace structure made by joining two workpieces using localized induction heating provided by an induction coil to heat the structure along a bondline to a joining temperature to reduce processing time and energy consumption, comprising the steps of:

(a) assembling at least two workpieces to define an assembly having a joint interface at the bondline to form the structure;

(b) placing the assembly in an induction heating press with the bondline adjacent a surrounding ribbon coil susceptor susceptible for induction heating and incorporated into a wall of a die adjacent the joint interface;

(c) energizing the induction coil to heat the susceptor and thereby to heat the workpieces locally at the joint interface;

(d) applying pressure by pushing the workpieces together laterally when the bondline reaches the joining temperature to produce a jointed part having a geometry;

(e) monitoring the geometry of the joined part; and

(f) de-energizing the coil.

5,587,099

SAFETY CONTAINER FOR MICROWAVE OVEN BAKING UTENSIL

James O. Kuhn, Box 444 203 Litchfield Rd., Norfolk, Conn. 06058, and Lee J. Goldman, 23 Buckingham Ave., Harvey Cedars, N.J. 08008

Continuation-in-part of Ser. No. 166,517, Dec. 13, 1993, Pat. No. 5,396,051, and Ser. No. 173,784, Dec. 27, 1993. This application Oct. 31, 1994, Ser. No. 332,137

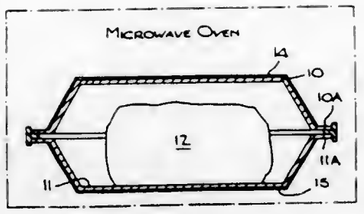
The portion of the term of this patent subsequent to Mar. 7, 2012, has been disclaimed.

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—728 **7 Claims**

1. A safety container for a baking utensil useable in a microwave oven to cook food held in the utensil, the utensil being provided

VOL 1193 ISS 4 DEC 24 1996 UMI



with a heating element having ferrite particles which absorb microwave energy to produce thermal heat to heat the food, said container comprising:

A. separable upper and lower sections formed of a material insensitive to microwave energy for housing the utensil; and

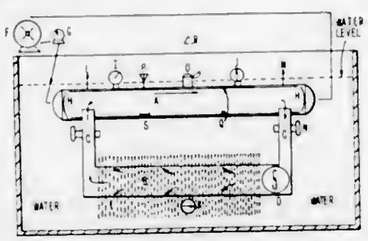
B. temperature-sensitive latching means that latch the sections together when the heating element of the utensil housed in the container raises the temperature of the utensil to a high level well above room temperature and automatically unlatch the sections when the temperature of the utensil is relatively cool and one can then safely remove the utensil from the container.

5,587,100

PROCESS AND THE CONTRIVANCE EMPLOYED FOR PRODUCING HEAT ENERGY WITHOUT COMBUSTION

James P. S. Huang, No. 22-4, Lane 64, Sec. II, Chung Shen Road, Chung Ho city, Taipei, Taiwan

Continuation of Ser. No. 237,281, May 3, 1994, abandoned.
This application Mar. 13, 1996, Ser. No. 614,912
Int. Cl.[6] H05B *6/46*
U.S. Cl. 219—772 **4 Claims**



1. A process for producing heat energy without combustion comprising:

a) using a vacuum pump to evacuate air from a cylindrical shaped reactor including an electrostatic wave generator and a heat releasing reactor which interconnect to said cylindrical shaped reactor through a gas circulating device;

b) flushing said cylindrical shape reactor and heat releasing reactor with nitrogen gas;

c) filling said cylindrical shaped reactor and heat releasing reactor with a predetermined amount of gaseous matter selected from the group consisting of nitrogen, helium and hydrogen;

d) turning on said electrostatic wave generator to produce static electricity at an energy level sufficient to energize the gaseous matter with kinetic energy of static electricity;

e) introducing the gaseous matter energized by said kinetic energy of static electricity into said heat releasing reactor through said gas circulating device for converting said kinetic energy to heat energy;

f) releasing said heat energy from said heat releasing reactor while restoring the energized gaseous matter to an unenergized state; and

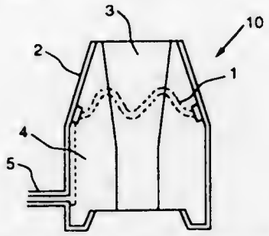
g) returning the restored gaseous matter to said cylindrical shape reactor to start another cycle.

5,587,101

GAS INJECTION NOZZLE FOR POURING LIQUID METAL

Hirokatsu Hattanda; Mitsukazu Ogiso; Yasuta Koike, and Kazuhiro Takagi, all of Tokyo, Japan, assignors to Tokyo Yogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1995, Ser. No. 536,438
Int. Cl.[6] B22D *41/58*
U.S. Cl. 222—603 **3 Claims**



1. A gas injection nozzle for pouring liquid metal, wherein:

(a) said nozzle having a circumference consisting of a porous refractory,

(b) said circumference of said nozzle is surrounded by an iron shell having a gas injection pipe nozzle through which gas is injected to form a gas pool; said gas pool extending perpendicularly along said circumference of said nozzle between said porous refractory and said iron shell; and

(c) said gas pool having a wavy space along at least one portion of said circumference of said nozzle.

5,587,102

MAGNETIC PAINT COMPOSITION AND METHOD

Donald J. Stern, Bellingham, Wash., and Dan Treleaven, Delta, Canada, assignors to DJS&T Limited Partnership, Bellingham, Wash.

Filed Aug. 25, 1994, Ser. No. 296,351
Int. Cl.[6] C09D *5/23*
U.S. Cl. 252—62.54 **9 Claims**

1. A paint composition comprising:

a. water;

b. a binder;

c. a particulate magnetically permeable material, comprising iron particles, distributed in the composition;

d. a thickening agent having thixotropic and viscosity characteristic such that the composition has higher viscosity when subjected to substantially no shear movement and lower viscosity when the composition is subjected to movement having high shear rate;

e. a rust inhibitor that is characterized in that with the paint in its stored condition before application, the rust inhibitor prevents rust caused by water in the composition, and is further characterized in that after application and drying of the paint composition, the rust inhibitor remains distributed throughout the dried paint composition in a manner that at such time as a second coat of waterbase paint is applied, with water from the second coat migrating into the dried paint, the rust inhibitor in the dried paint is positioned to prevent rust occurring by the water in the second coat having migrated into the previously applied paint composition;

whereby when the composition is being stored, its high-viscosity maintains the particulate material suspended in the composition and the rust inhibitor prevents rust in the particulate material, when the paint composition is applied to a wall surface, it is subjected to high shear rates to lower the viscosity and cause its easy application, and when the paint composition is dried and a second coat of waterbase paint is applied over the dried paint composition, with water from the second coat migrating into the dried paint composition the dried paint composition remains intact and rust is prevented.

5,587,103

COMPOSITION, AND METHOD FOR USING SAME, FOR ETCHING METALLIC ALLOYS FROM A SUBSTRATE

Timothy A. Dennis, Bloomdale, Ohio, assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 17, 1996, Ser. No. 587,692
Int. Cl.[6] C09K *13/08*
U.S. Cl. 252—79.3 **12 Claims**

1. A method for removing Aluminum Alloy from a substrate comprising applying a composition to said Aluminum Alloy, said composition being five (5) to ten (10) parts by volume Nitric Acid, four (4) to ten (10) parts by volume Buffered Oxide Etch, thirty (30) to sixty-five (65) parts by volume Phosphoric Acid, and twenty-one (21) to thirty (30) parts by volume Water.

5,587,104

READILY SOLUBLE DRY CONCENTRATES CONTAINING INGREDIENTS OF DETERGENTS

Christiane Zeise, Korschenbroich; Wilfried Raehse, Duesseldorf; Jochen Jacobs, Wuppertal, and Juergen Hoffmeister, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP91/02366, § 371 Date Sep. 8, 1993, § 102(e) Date Sep. 8, 1993, PCT Pub. No. WO92/12229, PCT Pub. Date Jul. 23, 1992
PCT Filed Dec. 10, 1991, Ser. No. 87,684
Claims priority, application Germany, Jan. 8, 1991, 41 00 306.3
Int. Cl.[6] C11D *17/00*
U.S. Cl. 510—298 **21 Claims**

1. Free-flowing and storable granular compacts comprising ingredients of detergent or cleaning compositions in concentrated form, said compacts having been prepared by the process of

(1) preparing an adhesively bound dry premix containing

(a) fine-particle detergent ingredients substantially free of binding or adhesive properties, and

(b) fine-particle detergent ingredients having binding or adhesive properties to form a substantially homogeneous premix, and

(2) press-molding said premix at a temperature of from about 40° C. to 80° C. in the substantial absence of shear forces whereby air is microdispersed in the resultant compacts.

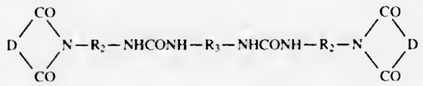
5,587,105

METHODS FOR MAKING LIQUID MOLDING COMPOUNDS USING DIAMINES AND DICYANATES

Clyde H. Sheppard, Boeing Aerospace Company, P.O. Box 399, M/S 73-09, Seattle, Wash. 98124-2499, and Hyman R. Lubowitz, 26 Coral Tree Ln., Rolling Hills Estates, Calif. 90274

Division of Ser. No. 168,289, Mar. 15, 1988. This application Jun. 5, 1995, Ser. No. 493,434
Int. Cl.[6] C07D *209/02;209/56;* **C09K** *3/00*
U.S. Cl. 252—183.11 **10 Claims**

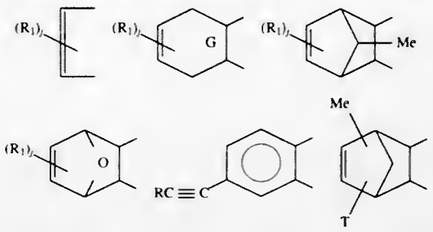
1. A method for making a liquid molding compound of the formula



comprising the step of simultaneously condensing an unsaturated anhydride selected from the group consisting of:

wherein

D=a hydrocarbon radical including an unsaturated functionality selected from the group consisting of:



R_1=lower alkyl, aryl, substituted alkyl, substituted aryl, lower alkoxy, aryloxy, halogen, or mixtures thereof;

G=—CH_2—, —O—, —S—, —SO_2—, —SO—, —CO—, —CH(R)—, or —$C(R)_2$—;

j=0, 1, or 2;

T=allyl or methallyl;

Me=methyl; and

R=hydrogen, lower alkyl, or phenyl,

with a diamine of the formula $H_2N—R_2—NH_2$ and a compound of the formula $OCN—R_3—NCO$, wherein R_3 is a hydrocarbon radical and R_2 is a hydrocarbon radical.

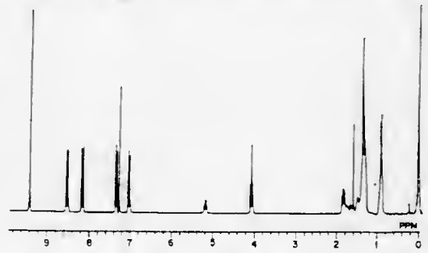
2. The method of claim 1 further comprising the step of blending the condensation product with an effective amount of a diluent.

5,587,106

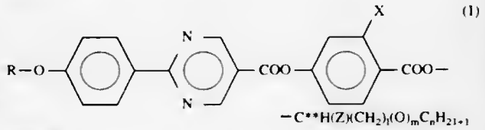
LIQUID CRYSTAL DISPLAY DEVICES AND LIQUID CRYSTAL SUBSTANCES THEREFOR

Masamichi Mizukami, Tsukuba; Tomoyuki Yui, Nagareyama; Yoshihisa Arai, and Yoshihiro Gocho, both of Tsukuba, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 52,604, Apr. 27, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 467,898
Claims priority, application Japan, Apr. 27, 1992, 4-107529
Int. Cl.[6] C09K *19/34;* **C07D** *239/02;* **G02F** *1/13*
U.S. Cl. 252—299.61 **9 Claims**



1. Liquid crystal substances which are represented by the formula (1):



(1)

wherein

R is a straight chain alkyl group having 6 to 10 carbon atoms,

X is hydrogen or fluorine atom,

Z is [—CF_3,]—CF_3, [or—C_2H_5,] and

C** stands for an asymmetric carbon atom, and

l is an integer of 5 to 7, m is 1 and n is 2.

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5,587,107

SiO_2 AEROGELS CONTAINING CARBON PARTICLES AND THEIR PREPARATION

Fritz Schwertfeger; Ulrich Schubert; Elisabeth Seyfried; Joachim Kuhn; Jochen Fricke, all of Wuerzburg, and Manfred Mielke, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 11, 1994, Ser. No. 179,698

Claims priority, application Germany, Jan. 13, 1993, 43 00 598.5

Int. Cl.[6] B01J *13/00;* **E04B** *1/76*

U.S. Cl. 252—315.6 **6 Claims**

1. An SiO_2 aerogel having a density of up to 395 kg/m^3 and containing carbon particles, which aerogel is obtained by heating

a) organically modified SiO_2 aerogels having a density of up to 395 kg/m^3 in the presence of at least one pyrolyzable hydrocarbon gas or at least one inert gas or

b) organically unmodified SiO_2 aerogels having a density of up to 395 kg/m^3 in the presence of at least one pyrolyzable hydrocarbon gas and in the presence or absence of inert gases to 600°–1300° C.

5,587,108

STYRENE MONOMER BASED NAIL TIP BLENDER AND BRUSH CLEANER

Michael R. Schick, Nashotah, Wis., assignor to European Touch Co., Inc., Milwaukee, Wis.

Filed Oct. 6, 1994, Ser. No. 319,278

Int. Cl.[6] C08K *5/01;5/07;5/15;* **A61K** *7/04*

U.S. Cl. 252—364 **10 Claims**

1. A solvent for partially dissolving an edge of a synthetic nail, said solvent comprising:

A) about 20% to about 50% by weight of styrene monomer;

B) about 20% to about 60% by weight of acetone;

C) about 15% to about 30% by weight of gamma butyrolactone; and

D) about 1% to about 10% by weight of a mixture comprising safflower oil and fragrance.

5,587,109

METHOD FOR INHIBITION OF OXYGEN CORROSION IN AQUEOUS SYSTEMS BY THE USE OF A TANNIN ACTIVATED OXYGEN SCAVENGER

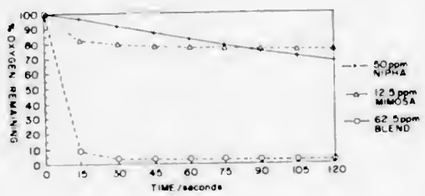
Brian Greaves, Runcorn; Stephen C. Poole, Newton-Le-Willows, both of England; Chih M. Hwa, Palatine, and Joseph C. Fan, Lake Zurich, both of Ill., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 107,550, Aug. 17, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 426,162

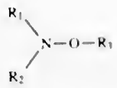
Claims priority, application United Kingdom, Aug. 17, 1992, 9217448

Int. Cl.[6] C23F *11/12;11/16*

U.S. Cl. 252—392 **14 Claims**



1. A method for the treatment of an aqueous system which comprises incorporating into the system (i) at least one member of the group consisting of (a) hydroxylamine or its derivatives, (b) water soluble salts and (c) precursors thereof the formula:



wherein R_1, R_2 and R_3, which may be the same or different, is a member of the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, and aryl, and (ii) tannin wherein (i) and (ii) are in a weight ratio of at least 2:1.

5,587,110

COMPOSITION BEING CAPABLE OF IMPARTING CONDUCTIVITY AND NON-TACKIFYING PROPERTY, PAINT USING THE COMPOSITION, AND ROLLER

Masayuki Yamana, and Tomohiro Isogai, both of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

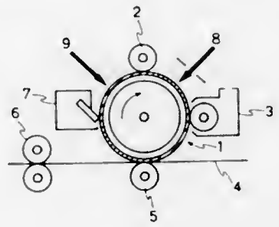
PCT No. PCT/JP94/01655, § 371 Date Jun. 30, 1995, § 102(e) Date Jun. 30, 1995, PCT Pub. No. WO95/09887, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 3, 1994, Ser. No. 481,366

Claims priority, application Japan, Oct. 5, 1993, 5-249593; Apr. 28, 1994, 6-091993

Int. Cl.[6] H01B *1/00;1/24*

U.S. Cl. 252—511 **20 Claims**



1. A composition consisting essentially of (A) carbon fluoride particles having a ratio F/C of fluorine atom to carbon atom of more than 0.5 and less than 1.0, and (B) at least one resin material selected from the group consisting of a thermoplastic resin, a thermosetting resin and a rubber; wherein the weight ratio of (A) to (B) is from 1/99 to 30/70, and said composition imparts electrical conductivity and non-tackifying property.

5,587,111

METAL PASTE, PROCESS FOR PRODUCING SAME AND METHOD OF MAKING A METALLIC THIN FILM USING THE METAL PASTE

Kazuhiro Watanabe, Tsuchiura; Michihiro Oshima, Hachinohe; Kazuhiro Setoguchi, Chiba, and Masaaki Oda, Chiba-ken, all of Japan, assignors to Vacuum Metallurgical Co., Ltd., Chiba-ken, Japan

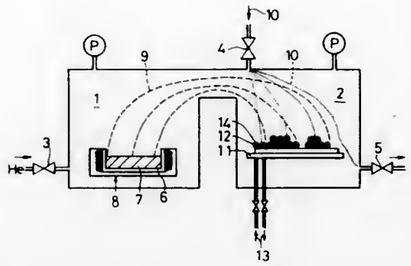
Continuation-in-part of Ser. No. 622,569, Dec. 5, 1990, abandoned. This application Mar. 29, 1991, Ser. No. 677,190

Claims priority, application Japan, Mar. 29, 1990, 2-81635

Int. Cl.[6] H01B *1/02*

U.S. Cl. 252—514 **8 Claims**

1. A metal paste comprising at least 14 wt. % of ultrafine particles of gold individually uniformly dispersed in a solvent



consisting essentially of at least one organic compound, said particles having a particle size of 100 angstroms or less and each particle having its entire surface covered with the solvent.

5,587,112

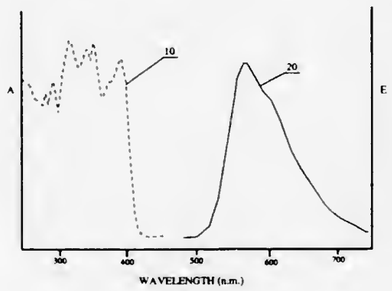
BENZAZOLE COMPOUNDS WITH ESIPT FLUORESCENCE

Joel M. Kauffman, Wayne, and Peter T. Litak, Lansdowne, both of Pa., assignors to Philadelphia College of Pharmacy and Science, Philadelphia, Pa.

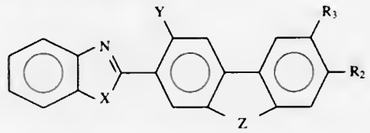
Filed Sep. 2, 1994, Ser. No. 300,401

Int. Cl.[6] F21V *9/04;* **C09K** *11/06;* **C07D** *277/62*

U.S. Cl. 252—589 **21 Claims**



1. An organic, fluorescent material comprising a 2-benzazolyl compound having the structure:



wherein X is a —N(R_1)— group, —O—, or —S—; Y is a proton donating group; Z is a —N(R_1)—group, —O—, or —S—; R_1 is a H or a C_1 to C_{10} alkyl group; R_2 is a H or an added 2-benzazolyl group; R_3 is a H when R_2 is a H and R_3 is H or a Y when R_2 is an added 2-benzazolyl group; and the 2-benzazolyl, the added 2-benzazolyl, or both the 2-benzazolyl and the added 2-benzazolyl is unsubstituted or substituted with one to four R_4 group(s), wherein each R_4 individually is a C_1 to C_{10} alkyl group, aryl group, halo group, or alkyl sulfonyl; or wherein two or more R_4 groups are fused into an aromatic group.

5,587,113

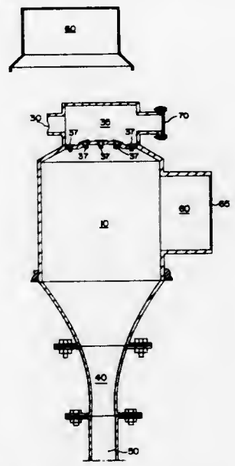
DEVICE FOR THE TREATMENT OF POLLUTED WATER

Antonio Caballero Pichardo, Calle de la Amargura No. 15 Lomas de la Herradura C.P., 52785 Huixquilucan, Mexico

Division of Ser. No. 320,567, Oct. 11, 1994, which is a continuation of Ser. No. 10,144, Jan. 28, 1993, abandoned. This application Apr. 12, 1995, Ser. No. 420,760

Int. Cl.[6] C02F *1/74*

U.S. Cl. 261—116 **2 Claims**



1. An aeration device, comprising:

a tubular section defining a primary chamber, said tubular section having an opening in a side thereof forming an orifice adjacent said primary chamber for the admission of ambient air from the surrounding atmosphere into said primary chamber, said tubular section having an upper peripheral edge and a lower peripheral edge;

a screen for preventing the entrance of foreign particles positioned over the orifice in said tubular section;

means defining a distribution chamber for receiving a liquid to be aerated; said distribution chamber positioned above and sealingly connected to the upper peripheral edge of said tubular section;

a plurality of high speed nozzels positioned at a top end of said primary chamber and fluidly connected to said distribution chamber for delivering accelerated sprays of liquid from said distribution chamber to said primary chamber;

a tapering section having an upper peripheral edge and a lower peripheral edge, wherein the upper peripheral edge of said tapering section is positioned below and sealingly connected to the lower peripheral edge of said tubular section, and wherein a diameter of the upper peripheral edge of said tapering section is larger than a diameter of the lower peripheral edge of said tapering section;

a venturi section including an upper peripheral edge and a lower peripheral edge, wherein the upper peripheral edge of said venturi section is positioned below and sealingly connected to the lower peripheral edge of the tapering section for accelerating the air and liquid therefrom with the entrapped air and for creating a suction at the orifice for drawing air into said primary chamber;

a single drain pipe having an upper peripheral edge that is sealingly connected to the lower peripheral edge of said venturi section, said drain pipe having a lower open end, wherein said drain pipe constitutes the sole outlet of said device such that all of the liquid and air entering said device exits said device through said drain pipe wherein said tapering section, said venturi section, and said drain pipe each have respective maximum cross sectional areas that are substantially smaller than a maximum cross sectional flow area of said primary chamber.

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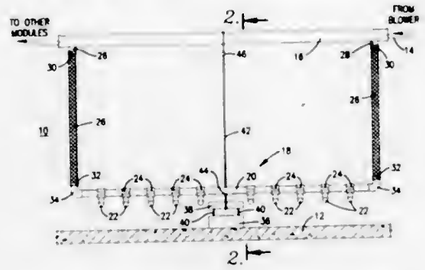
5,587,114

AERATION SYSTEM EMPLOYING RETRIEVABLE AERATION MODULES

Charles E. Tharp, Columbia, Mo., assignor to Environmental Dynamics, Inc., Columbia, Mo.

Filed Jun. 6, 1995, Ser. No. 471,768
Int. Cl.[6] B01F 3/04
U.S. Cl. 261—124 14 Claims



1. Apparatus for aerating liquid in a basin, comprising:

an air supply pipe in the basin adapted to receive air under pressure, said air supply pipe comprising a floating pipe on the surface of the liquid;

a submerged conduit in the basin;

a plurality of aerators mounted to said submerged conduit in a manner to receive air therefrom, said aerators being adapted to discharge air into the liquid;

flexible hose means for directing air from said air supply pipe to said submerged conduit;

means for normally holding said submerged conduit down in the basin at a submerged location; and

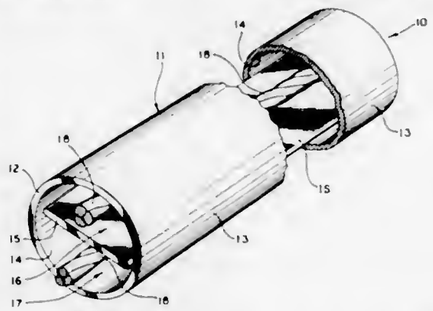
means for disabling said holding means to allow the buoyancy of said conduit to raise the conduit and aerators to a location accessible from the surface of the liquid for maintenance.

5,587,115

METHOD OF MANUFACTURING A CONDUIT ASSEMBLY WITH A FLOATING DIVIDER

Jerry L. Allen, Westfield Ctr., Ohio, assignor to Vikimatic Sales, Inc., Wadsworth, Ohio

Division of Ser. No. 215,595, Mar. 22, 1994, abandoned. This application May 19, 1995, Ser. No. 446,563
Int. Cl.[6] B29C 47/02
U.S. Cl. 264—1.24 8 Claims



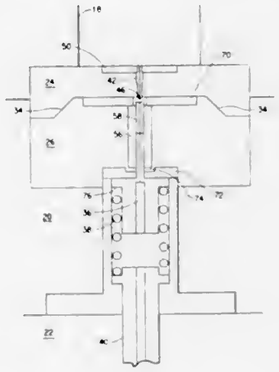
1. A method of manufacturing a conduit assembly comprising the steps of extruding a longitudinally extending tubular casing through a die, and at the same time feeding a longitudinally extending web member into the casing without contacting the casing as it is being extruded.

5,587,116

PROCESS FOR INJECTION MOLDING OPTICAL FERRULES

Melvin H. Johnson, Chadds Ford, Pa., and Frank M. Willis, Wenonah, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 238,238, May 4, 1994, Pat. No. 5,482,451, which is a continuation of Ser. No. 984,796, Dec. 3, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 459,157
Int. Cl.[6] B29D 11/00; B29C 45/14;45/36
U.S. Cl. 264—1.25 9 Claims



1. A process for the preparation of an optical ferrule containing a cylindrical member therein comprising:

(a) introducing a cylindrical member into guide means having first and second ends and a center line and an aperture formed along the center line, wherein the cylindrical member is received along the aperture;

(b) positioning a sleeve for receiving a piston therethrough aligned relative to said guide means of (a), said piston having first and second ends and a center line and an aperture formed along the center line, said first end of the piston located sufficiently close to said second end of said guide means in a first position, so that said first end of said piston receives the cylindrical member along the aperture of said piston;

(c) locating a pin to extend into said sleeve and having a first end in contact with said second end of said piston and having a hole formed therethrough for receiving the cylindrical member and positioning means attached to a second end of said pin;

(d) exerting a force sufficient to position said piston in the first position via biasing means which engages said positioning means and a pusher attached to said biasing means;

(e) dispensing polymer through one or more fill gates positioned equidistant from one another at a uniform pressure into a cavity defined by said second end of said guide means, said sleeve and said first end of said piston, and containing said guide means, piston and pin in position relative to each other, the polymer dispensed sufficiently to move said piston to a second position to form the optical ferrule within said cavity;

(f) cooling the formed optical ferrule under pressure; and

(g) withdrawing the optical ferrule with a cylindrical member contained therein from said cavity.

5,587,117

PROCESS FOR INSULATING PIPES USING POLYURETHANE RIGID FOAMS BY THE ROTATIONAL CASTING PROCESS

Norbert Eisen, Köln; Lutz-Peter Godthardt, Leverkusen, and Peter Haas, Haan, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 3, 1995, Ser. No. 382,813
Claims priority, application Germany, Feb. 17, 1994, 44 05 061.5
Int. Cl.[6] B29C 44/06;44/12
U.S. Cl. 264—45.7 11 Claims

1. In a process for insulating pipes by applying a rigid polyurethane foam-forming reaction mixture as an insulating layer and optionally applying an external top coating, with both the insulating layer and the top coating being applied by a rotational casting process, the improvement wherein said foam-forming reaction mixture comprises:

a) an aromatic polyisocyanate with

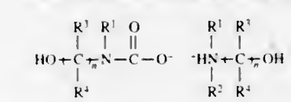
b) an organic compound having a molecular weight of from 92 to 1,000, containing on average at least 3 hydroxyl groups and

c) an aliphatic, cycloaliphatic or aromatic polyamine and/or polyimine having a molecular weight of from 32 to 1,000 as a cross-linking agent in the presence

d) of a blowing agent, and optionally in the presence of

e) known auxiliary substances and additives wherein said reaction mixture also contains

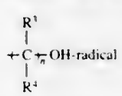
f) one or more compounds having a molecular weight of from about 166 to about 1,000 and being of the general formula



wherein

n represents an integer between 2 and 9,

R^1 signifies hydrogen, a C_1–C_9 alkyl radical or a



R^2 signifies hydrogen, and

R^3 and R^4 signify hydrogen or methyl.

5,587,118

PROCESS FOR MAKING FIBER FOR A CARPET FACE YARN

William C. Mallonee, P.O. Box 2318, Dalton, Ga. 30722

Filed Mar. 14, 1995, Ser. No. 407,507
Int. Cl.[6] D01F 8/06;8/12
U.S. Cl. 264—78 12 Claims

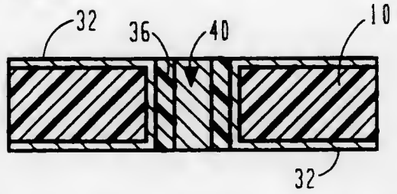
1. A method for making conjugate filaments for a carpet face yarn having improved stain resistance and resiliency comprising blending from about 5 to about 40 wt. % polyamide pellets with from about 60 to about 95 wt. % polyolefin pellets; feeding the blend to a hot melt extruder to melt the mixture; and forcing the molten mixture at a shear rate within the range of from about 1000 to about 5000 reciprocal seconds through a spinneret containing a plurality of trilobal or delta capillary openings thereby forming conjugate filaments containing polyamide fibrils formed in-situ in a trilobal or delta cross-section polyolefin matrix, said filaments having a denier ranging from about 1350 to about 1550 per 84 filaments.

5,587,119

METHOD FOR MANUFACTURING A COAXIAL INTERCONNECT

David M. White, Sulpher Springs, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 305,290, Sep. 14, 1994, abandoned. This application May 26, 1995, Ser. No. 452,104
Int. Cl.[6] C04B 35/00
U.S. Cl. 264—104 4 Claims



1. A method for manufacturing a coaxial interconnect, comprising the steps of:

forming an outer aperture through a substrate layer;

coating an inner surface of the outer aperture in the substrate layer with an electrically conductive material to form an outer conductor of the coaxial inter-connect;

filling the coated outer aperture with a dielectric material;

forming an inner aperture through the dielectric material; and

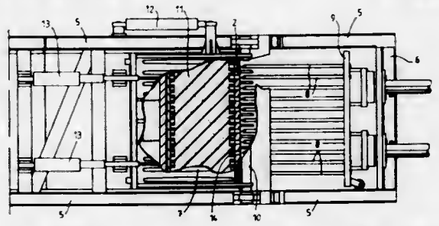
filling the inner aperture in the dielectric material with an electrically conductive material to form a center conductor of the coaxial inter-connect.

5,587,120

METHOD FOR SHAPING A POLYMER MIXTURE INTO A BLOCK WITH A STABLE SHAPE AND SIZE

Jean-Paul B. Vieslet, Rue Bouhette 92/31, B 4420 Montegnee, Belgium; Bernard P. Vieslet, Apar. 12A, Collinas de Bello Monte, Edie. Rio Aranca, Caracas, Venezuela, and Pierre G. Poswick, Servitude de la Dreve 3, B-7050 Erbisoful, Belgium

PCT No. PCT/BE94/00022, § 371 Date Nov. 6, 1995, § 102(e) Date Nov. 6, 1995, PCT Pub. No. WO94/21435, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 15, 1994, Ser. No. 525,579
Claims priority, application Belgium, Mar. 16, 1993, 9300249
Int. Cl.[6] B29C 35/02
U.S. Cl. 264—118 8 Claims



1. Method for shaping an elementary block of stable shape and size from fragments of a polymer mixture which is compressed and constrained under a load into a defined volume of a hydraulic press (1), comprising at least one dead volume delimited by a first moving platen (3) moved into end of travel by a piston (4) and a fixed platen (2) constituting the end wall of the press, so as to form a bale of compacted fragments of a polymer mixture which is transpierced by spikes (8) heated to a temperature above the softening point of at least one of the polymers of the aforementioned mixture, wherein spikes (8), carried by a second moving platen (9) arranged with respect to the first moving platen (3), on the other side of the fixed platen (2) forming the end wall of the press (1), are made to penetrate, via orifices provided through the fixed platen, (2) forming the end wall of the press, into the bale of

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polymers previously compacted in the dead volume of the press, during or after compression.

5,587,121

METHOD AND APPARATUS FOR THE PRODUCTION OF A GAS-PERVIOUS PART IN A GAS-PERVIOUS MOULD AND A PRODUCT MADE BY THIS METHOD

Juha Vesa, Palokärjenkatu 14 D, Turku, Finland

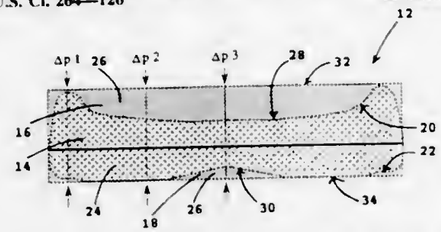
PCT No. PCT/FI94/00013, § 371 Date Jul. 13, 1995, § 102(e) Date Jul. 13, 1995, PCT Pub. No. WO94/15768, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 12, 1994, Ser. No. 491,857

Claims priority, application Finland, Jan. 13, 1993, 930125

Int. Cl.[6] B29C *35/02;* **B68G** *11/03*

U.S. Cl. 264—126 **12 Claims**



1. A method for moulding a part from a gas-pervious raw material compound in a gas-pervious mould which at least at one stage of the production is positioned in the gas flow of a flow chamber in such a way that the gas flows through the mould and the raw material, comprising the steps of:

positioning a gas-pervious layer of filling material immediately in front of and/or behind the gas-pervious mould in the gas flow; and

forming said layer of gas-pervious filling material so that the pressure drop across the mould, the raw material compound and the filling material layer is substantially constant over the whole cross-section of the gas flow through the mould, raw material compound and the filling material layer.

5,587,122

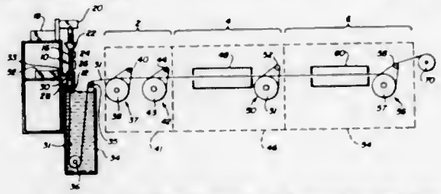
IN-LINE ANNEALING OF SUTURES

David J. Lennard, Flemington, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 10, 1995, Ser. No. 386,617

Int. Cl.[6] D01D *5/08;10/02*

U.S. Cl. 264—178 F **9 Claims**



1. An in-line process for producing a polypropylene suture comprising performing the steps of (a) extruding melted polypropylene resin through an orifice and rapidly quenching the melted polypropylene resin to produce a filament; (b) drawing the filament in the range of from about 4× to about 7.5× in a first drawing zone to produce a drawn filament; (c) drawing the singly drawn filament in a second drawing zone in the range of from about 1.0× to about 2.5× while in a second heated zone being maintained at a temperature in the range of from about 30° C. to about 160° C., to form a doubly drawn filament; (d) relaxing and annealing the doubly drawn filament in the range of from about 0.75× to about 0.9×, in a third heated zone being maintained at a temperature in the range of from about 100° C. to about 180° C., to form an annealed polypropylene suture.

5,587,123

Patent Not Issued For This Number

5,587,124

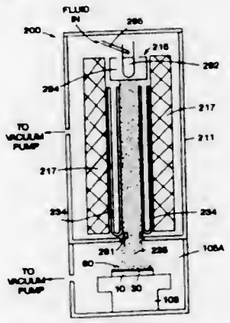
METHOD OF MAKING SYNTHETIC DIAMOND FILM WITH REDUCED BOWING

John Meroth, 333 Howard St., Northboro, Mass. 01532

Filed Jul. 5, 1994, Ser. No. 270,656

Int. Cl.[6] B29C *11/00;* **B28B** *35/00*

U.S. Cl. 264—430 **12 Claims**



1. A method for synthesizing generally flat free-standing diamond, comprising the steps of:

a) providing a deposition chamber;

b) providing a deposition surface in said deposition chamber, said deposition surface having a concave contour;

c) directing a plasma toward said concave deposition surface, the plasma including hydrogen and a hydrocarbon, such that synthetic diamond is formed on said concave deposition surface; and

d) releasing said synthetic diamond from said concave deposition surface to obtain free standing diamond, wherein said released synthetic diamond generally flattens.

5,587,125

NON-COEXTRUSION METHOD OF MAKING MULTI-LAYER ANGIOPLASTY BALLOONS

Suranjan Roychowdbury, Minnetonka, Minn., assignor to Schneider (USA) Inc., Minneapolis, Minn.

Filed Aug. 15, 1994, Ser. No. 290,075

Int. Cl.[6] B29C *49/22*

U.S. Cl. 264—515 **18 Claims**

1. A method of manufacturing a multi-layer expander member for an angioplasty catheter comprising the steps of:

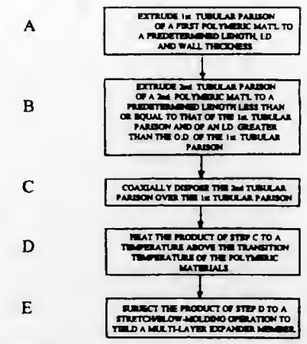
a) preforming a first tubular parison of a polymeric material having first physical properties;

b) preforming a second tubular parison of a polymeric material having second physical properties;

c) later disposing one of said first and second preformed tubular parisons over the other of said first and second preformed tubular parisons to form a composite parison;

d) heating said composite parison to a predetermined temperature; and

e) blow-molding said composite parison in a mold having a cavity of a predetermined length and radial dimension to bond



the polymeric material comprising the first tubular parison to the polymeric material comprising the second tubular parison in forming said multi-layer expander member.

5,587,126

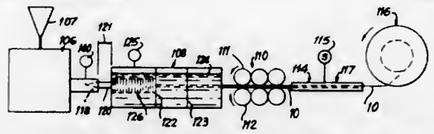
METHOD OF MANUFACTURING A PIPE LINER FOR INSTALLATION IN AN EXISTING CONDUIT

Campbell H. Steketee, Jr., Salem, Oreg., assignor to NuPipe, Inc., Memphis, Tenn.

Continuation of Ser. No. 34,918, Mar. 19, 1993, which is a continuation of Ser. No. 612,163, Nov. 9, 1990, abandoned, which is a division of Ser. No. 180,904, Apr. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 76,973, Jul. 28, 1987, Pat. No. 4,867,921, which is a continuation-in-part of Ser. No. 846,322, Mar. 31, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 485,014

Int. Cl.[6] B29C *47/90;63/34*

U.S. Cl. 264—568 **18 Claims**



1. A method of manufacturing a thermoplastic liner for installation into an existing conduit in a desired non-circular collapsed and folded form, comprising:

extruding thermoplastic material through a die to form a substantially tubular shape of a desired size;

shaping the extruded tubular material exiting the die at a temperature above the temperature which the material is pliable to the desired non-circular collapsed and folded form; and

cooling the extruded material in the non-circular collapsed and folded form after shaping so that the liner has a memory for the desired non-circular collapsed and folded form such that when reheated to render it pliable, it retains the desired non-circular collapsed and folded form.

5,587,127

METHOD AND APPARATUS FOR CARTON STERILIZATION

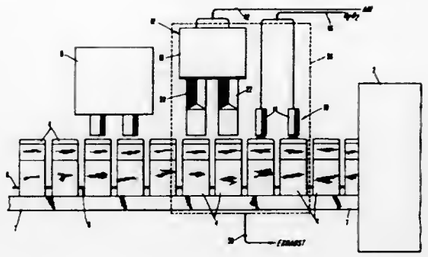
Leonard A. Carlson, Bloomington, Minn., assignor to Tetra Laval Holdings & Finance SA, Pully, Switzerland

Division of Ser. No. 974,694, Nov. 12, 1992, Pat. No. 5,368,828. This application Aug. 24, 1994, Ser. No. 293,948

Int. Cl.[6] A61L *2/18*

U.S. Cl. 422—28 **8 Claims**

1. A method for sterilizing food cartons of the type having a preformed bottom and upright side walls, the method comprising:



applying a solution of hydrogen peroxide to the bottom and side walls of a carton;

inserting a mandrel into the carton, said mandrel having an interior and a plurality of nozzles communicating with the interior;

directing a stream of heated air through the interior of the mandrel and through said nozzles while the mandrel is in the carton, and out of the carton through a space between sides of the mandrel and the side walls of the carton; and

withdrawing the mandrel from the carton.

5,587,128

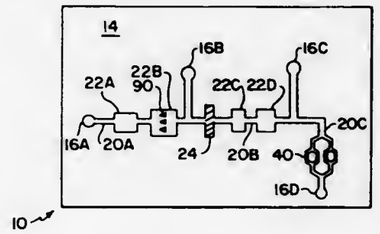
MESOSCALE POLYNUCLEOTIDE AMPLIFICATION DEVICES

Peter Wilding, Paoli, and Larry J. Kricka, Berwyn, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 308,199, Sep. 19, 1994, Pat. No. 5,498,392, which is a continuation of Ser. No. 877,662, May 1, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 338,728

Int. Cl.[6] C12Q *1/68;* **G01N** *33/50;21/01*

U.S. Cl. 422—50 **36 Claims**



1. A device for amplifying a polynucleotide in a sample by conducting a polynucleotide amplification reaction, the device comprising:

a solid substrate fabricated to include at least one polynucleotide amplification reaction chamber, said chamber being permanently sealed with a cover and having one mesoscale cross-sectional dimension of width or depth between about 0.1 and 1,000 μm, said reaction chamber comprising at least one wall having associated therewith a composition which diminishes inhibition by said wall of a polynucleotide amplification reaction in said chamber; and

at least one port in fluid communication with said reaction chamber, for introducing said sample into said reaction chamber, said reaction chamber and at least one said port being of dissimilar cross-section.

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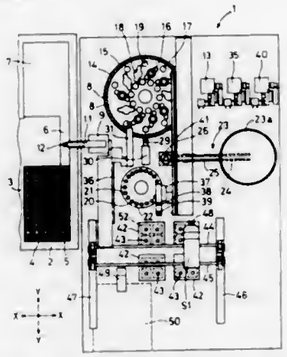
5,587,129
APPARATUS FOR AUTOMATICALLY ANALYZING SPECIMEN

Tsuyoshi Kurosaki; Atsuo Tomioka, and Takashi Yamato, all of Hyogo, Japan, assignors to Toa Medical Electronics Co., Ltd., Hyogo, Japan

Filed Sep. 20, 1995, Ser. No. 530,901
Claims priority, application Japan, Sep. 21, 1994, 6-266015
Int. Cl.[6] G01N *35/02*
U.S. Cl. 422—64 **13 Claims**



1. An apparatus for automatically analyzing a specimen, comprising:

sample vial retaining means for retaining a sample vial containing a specimen;

a stock vial into which part of the specimen in the sample vial is to be dispensed;

stock vial retaining means for retaining a stock vial;

first dispensing means for dispensing the specimen in the sample vial into the stock vial;

an assay vial into which part of the specimen in the stock vial is to be dispensed;

assay vial retaining means for retaining a plurality of assay vials;

second dispensing means for dispensing the specimen in the stock vial into the assay vial;

a reagent container for containing a reagent;

third dispensing means for dispensing the reagent into the assay vial;

assay means for assaying the specimen in the assay vial;

assay vial transporting means for transporting the assay vial from the assay vial retaining means to the assay means;

vial discharging means for discharging the assay vial after the assay; and

a controller for controlling the sample vial retaining means, the stock vial retaining means, the first dispensing means, the assay vial retaining means, the second dispensing means, the third dispensing means, the assay means, the assay vial transporting means, and the vial discharging means,

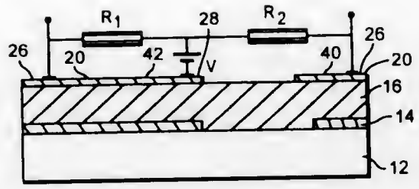
whereby the specimen, once dispensed from the sample vial into the stock vial, is dispensed from the stock vial into the assay vial for the assay throughout the automatic analysis.

5,587,130
SELECTED AREA ADHESION AND SURFACE PASSIVATION OF METAL FILMS

Qingcheng Bao, Tempe; Ian Sorensen, Phoenix, and William Glaunsinger, Chandler, all of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Continuation-in-part of Ser. No. 31,610, Mar. 15, 1993, Pat. No. 5,466,605. This application Dec. 9, 1994, Ser. No. 353,448
Int. Cl.[6] G01N *27/12*
U.S. Cl. 422—88 **28 Claims**

1. A method of affixing metal film to a substrate with controlled passivation of said metal film, comprising:



applying a thin layer of a metallic adhesive to a portion of a surface of the substrate to form an adhesive pattern;

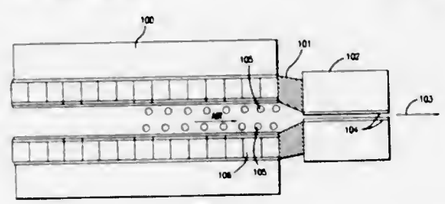
applying the metal film to the surface of the substrate over the metallic adhesive so that said metal film is in contact with at least some portion of said metallic adhesive and at least some portion of the surface of the substrate;

exposing an assembly including the substrate, the metallic adhesive, and the metal film to an atmosphere containing a constituent having sufficient bond energy to form a compound having a lower energy state than the pure metallic adhesive, to cause the metallic adhesive to migrate to an exposed surface of said metal film and form a stable compound, thereby passivating a portion of the exposed surface of said metal film corresponding to said adhesive pattern.

5,587,131
SYSTEM FOR AN EFFICIENT MANUFACTURE OF OZONE

Boris Malkin; Gena Perlov, and Shmuel Yannai, all of Haifa, Israel, assignors to Ozontech Ltd., Israel

Continuation-in-part of Ser. No. 209,563, Mar. 10, 1994, abandoned. This application Mar. 17, 1995, Ser. No. 405,848
Claims priority, application Israel, Mar. 25, 1993, 105166
Int. Cl.[6] B01J *19/12*
U.S. Cl. 422—186.11 **14 Claims**



1. A system for producing ozone at a high efficiency from oxygen or air, having at least two parallel electrodes made of metallic surfaces and separated by dielectric insulating material, wherein air or oxygen is passed through the gaps between the electrodes with an effective electric field of at least 4 kV/mm, comprising:

a) a ratio of electrode surface area to gas volume of at least 2 cm^2.min/l.

b) the electric field in said gap formed by the difference in potentials between the electrodes and the dielectric insulating material and having a breakdown voltage at least 12 kV/mm; and

c. Peltier heat pumps connected to the outer surface of the electrodes and capable of removing heat produced to the outer surface of the electrodes.

5,587,132
METHOD FOR PRODUCING HIGH PURITY VANADIUM ELECTROLYTIC SOLUTION

Masato Nakajima; Toshiaki Akahoshi; Masatoshi Sawahata; Yutaka Nomura, and Kanji Sato, all of Kashima-gun, Japan, assignors to Kashima-Kita Electric Power Corporation, Ibaraki-ken, Japan

Filed Nov. 6, 1995, Ser. No. 554,570
Claims priority, application Japan, Nov. 17, 1994, 6-283694
Int. Cl.[6] C01G *31/00;* **H01B** *1/00*
U.S. Cl. 423—62 **12 Claims**

1. A method for producing an electrolytic solution containing vanadium as positive and negative electrode active materials, said method comprising:

(1) purifying a vanadium compound selected from the group consisting of vanadium pentoxide and ammonium metavanadate by:

dissolving a crude mixture containing said vanadium compound and impurities in a solvent under an alkaline or neutral condition,

precipitating said polyvanadate compound by thermal polymerization of vanadium ions under an acidic condition, and

isolating said polyvanadate compound from the solution containing impurities;

(2) baking part of said pure polyvanadate compound at a temperature range of 400° to 690° C. in an inert or oxidizing gas atmosphere so as to remove ammonium ions;

(3) treating another part of said polyvanadate compound under a reductive atmosphere to form a trivalent vanadium compound is formed;

(4) dissolving said trivalent vanadium compound in an acid solution to form a V^{3+} electrolytic solution; and

(5) mixing said vanadium pentoxide and said V^{3+} electrolytic solution to form a V^{4+}/V^{3+} mixed electrolytic solution.

5,587,133
DELITHIATED COBALT OXIDE AND NICKEL OXIDE PHASES AND METHOD OF PREPARING SAME

Glenn G. Amatucci, Raritan, and Jean-Marie Tarascon, Martinsville, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Feb. 3, 1995, Ser. No. 383,401
Int. Cl.[6] C01D *1/02;* **C01G** *49/02;51/04*
U.S. Cl. 423—138 **10 Claims**

1. A method of preparing a stable cobalt dioxide phase comprising:

a) preparing an electrolytic cell having an anode, an electrolyte inert to oxidation, and a cathode comprising a lithium cobalt oxide intercalation complex; and

b) applying a voltage in excess of about 5.0 V to deintercalate substantially all lithium from said lithium cobalt oxide intercalation complex.

2. A stable dioxide phase prepared according to the method of claim 1.

5,587,134
PROCESS FOR DECOMPOSING AMMONIA IN AN OFF-GAS

Flemming Dannevang, Copenhagen, Denmark, assignor to Haldor Topsøe A/S, Denmark

Filed Oct. 12, 1995, Ser. No. 542,145
Claims priority, application Denmark, Oct. 14, 1994, 1184/94
Int. Cl.[6] B01D *53/22*
U.S. Cl. 423—237 **9 Claims**

1. In a process for the catalytic low temperature oxidation of ammonia with oxygen to nitrogen in an ammonia containing off-gas that also contains oxygen at a temperature of between 200° C. and 500° C., said oxygen consisting essentially of O_2, the improvement comprising the steps of:

sulfating a catalyst comprising on an inert carrier a metal selected from the group consisting of copper, cobalt, iron, chromium, nickel, manganese and mixtures thereof in the form of their oxides and/or sulfates and a further component selected from the group of platinum metals;

contacting the ammonia containing off-gas with the catalyst, and withdrawing a decomposed gas being rich in nitrogen.

5,587,135
PROCESS FOR THE CATALYTIC DECOMPOSITION OF DINITROGEN MONOXIDE IN A GAS STREAM

Thomas Fetzer, Speyer; Wolfgang Buechele, Ludwigshafen; Hermann Wistuba, Mannheim; Bernhard Otto, Limburgerhof; Gert Buerger, Mannheim, and Paul Pijl, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/00081, § 371 Date Mar. 24, 1995, § 102(e) Date Mar. 24, 1995, PCT Pub. No. WO94/16798, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 13, 1994, Ser. No. 403,835
Claims priority, application Germany, Jan. 21, 1993, 43 01 470.4
Int. Cl.[6] B01J *8/00*
U.S. Cl. 423—239.1 **12 Claims**

1. A process for the catalytic decomposition of dinitrogen monoxide in a gas stream which comprises contacting the gas stream at temperatures of 200°–900° C. and pressures of 0.1 to 20 bar with a catalyst free of noble metals, said catalyst being prepared by combining a spinel $CuAl_2O_4$ in an Al_2O_3 matrix with an additional spinel-forming metal component selected from the group consisting of tin, lead, zinc, magnesium, calcium, strontium and barium or mixtures thereof in elemental form or as an oxide or salt, and calcining at temperatures of 300°–1300° C. and under pressures of 0.1–200 bar for partial or complete liberation of the copper from said spinel in the form of its oxide by replacement with said additional metal component.

5,587,136
DRY PROCESS DESULFURIZATION AND DENITRIFCATION PROCESS

Nobuhide Ikeyama, and Yutaka Iwanaga, both of Fukuoka-ken, Japan, assignors to Mitsui Mining Co., Ltd., Tokyo, Japan

Filed May 2, 1995, Ser. No. 433,927
Claims priority, application Japan, May 10, 1994, 6-119655
Int. Cl.[6] C10B *21/00*
U.S. Cl. 423—239.1 **8 Claims**

1. A process for the desulfurization and denitrification by dry process comprising treating a waste gas containing SOx and NOx and catalyst-poisoning materials in an apparatus for mainly effecting desulfurization and then in an apparatus for mainly effecting denitrification, characterized by passing the waste gas through a desulfurization apparatus of a moving bed, in which a carbonaceous adsorbent is moved downward at a temperature of 100° to 200° C., adding ammonia to the waste gas at a temperature of 100° to 200° C., leaving the desulfurization apparatus, and then passing the waste gas through the low temperature denitrification apparatus, in which a catalyst of TiO_2-V_2O_5 comprising vanadium oxide supported on titanium oxide of anatase, having a specific surface area of 100 to 250 m^2/g and micropores of 1.5 to 2.5 nm in pore diameter and 7.5 to 8.5 nm in pore diameter respectively in an amount of at least 0.05 cc/g, is filled, at a temperature of 100° to 200° C., thus effecting the denitrification.

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5,587,137

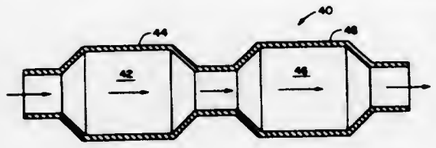
EXHAUST GAS CONVERSION METHOD USING THERMALLY STABLE ZEOLITES

Srinivas H. Swaroop, and Raja R. Wusirika, both of Painted Post, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 183,472, Jan. 18, 1994, Pat. No. 5,447,694. This application Jun. 5, 1995, Ser. No. 464,109

Int. Cl.[6] B01J *8/02*

U.S. Cl. 423—239.2 **9 Claims**



1. A method for removing at least one of the pollutants NO_x, CO, and hydrocarbons from an exhaust gas, said method comprising contacting said exhaust gas in undiverted flow first with a zeolite suitable for adsorption of hydrocarbons, and thereafter with a main catalyst suitable for conversion of NO_x, CO, and hydrocarbons to innocuous products, at a temperature ranging from cold-start temperatures to light-off temperatures, wherein when the temperature is in the cold-start range and the exhaust gas contains hydrocarbons, the zeolite adsorbs the hydrocarbons, and when the temperature is in the light-off range, and the exhaust gas contains NO_x, CO, and hydrocarbons, the main catalyst converts the NO_x, CO, and the hydrocarbons to innocuous products, said zeolite being selected from the group consisting of Y zeolite, Beta, ZSM-5, mordenite, and combinations thereof, and having a SiO_2/Al_2O_3 mole ratio of no greater than about 200, said zeolite being ion exchanged with chromium.

5,587,138

PROCESS FOR PREVENTING THE FORMATION OF HARMFUL ORGANIC SUBSTANCES AND STEAM GENERATOR FOR CARRYING OUT THE PROCESS

Michael Bobik; Ralf L. Lindbauer, both of Graz, and Alfred Glasner, Passail, all of Austria, assignors to Austrian Energy & Environment, SGP/Waagner-Biro GmbH, Vienna, Austria

Continuation-in-part of Ser. No. 87,722, Jul. 7, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 422,549

Claims priority, application Austria, Dec. 18, 1991, 2504/91

Int. Cl.[6] C01B *17/00*

U.S. Cl. 423—242.1 **17 Claims**

1. A process for minimizing the formation of dioxins and furan from organic building blocks during combustion of composite combustible materials in a combustion chamber during which combustion gas containing SO_2 is formed and, wherein the combustion gas is passed in a flow from the combustion chamber to a dedusting device, cooled and purified, comprising increasing the SO_3 content in the combustion gas flow to a value in the range of between about 75 mg/m^3 to about 500 mg/m^3 during the period that the combustion gas flow is from about 300° to about 800° C. until at least surface regions of particles of metal dusts contained in the combustion gas are convened to sulfates to thereby minimize formation of dioxins and furan.

5,587,139

HIGH DENSITY NICKEL HYDROXIDE CONTAINING BORON AND A METHOD FOR PREPARING IT

Dong-Yup Shin, Kyunki-Do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Division of Ser. No. 390,958, Feb. 21, 1995. This application Jun. 7, 1995, Ser. No. 487,440

Claims priority, application Rep. of Korea, May 20, 1994, 94-11024

Int. Cl.[6] C01B *35/00;* **C01G** *53/00*

U.S. Cl. 423—275 **21 Claims**

1. A method for preparing a boron containing nickel hydroxide powder, said method comprising the steps of:

mixing a nickel sulfate solution containing a boron compound in a concentration in a range of from 0.05 to 0.5 mol/L with ammonium hydroxide in a premixing vessel to form a nickel ammonium complex;

supplying said nickel ammonium complex to a reactor;

supplying a solution of sodium hydroxide to said reactor to form a mixture; and

holding said mixture in said reactor for a time sufficient to form said boron containing nickel hydroxide.

5,587,140

PROCESS FOR PRODUCING POWDERS OF TRANSITION METAL BORIDE

Shinji Fujiwara; Hiroshi Tabuchi, and Akihiko Takahashi, all of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 16, 1995, Ser. No. 442,503

Claims priority, application Japan, May 18, 1994, 6-103734

Int. Cl.[6] C01B *35/04*

U.S. Cl. 423—297 **6 Claims**

1. A process of producing a powder of a transition-metal boride, which comprises:

contacting a molten phase salt with a molten phase aluminum containing a transition-metal element selected from the group consisting of Groups IV and V of the Periodic Table, said molten phase salt comprising a fluoride and at least one boron compound selected from the group consisting of boron oxide, boric acid and borax, and said contact being carried out at an atomic ratio of boron compound expressed as elemental boron to the transition-metal element of from 0.5 to 4.0 at a temperature which is not lower than 660° C. and which is less than 1000° C. to produce transition-metal boride particles in the molten phase aluminum; and

recovering the transition-metal boride particles from the molten phase aluminum.

5,587,141

METHOD AND DEVICE FOR THE PRODUCTION OF FULLERENES

Satoshi Ohshima, Abiko; Motoo Yumura, Tsukuba; Yasunori Kuriki, Tsukuba; Kunio Uchida, Tsukuba, and Fumikazu Ikazaki, Tsukuba, all of Japan, assignors to Director-General of Industrial Science and Technology, Japan

Filed Feb. 13, 1995, Ser. No. 387,253

Claims priority, application Japan, Feb. 25, 1994, 6-053290

Int. Cl.[6] C01B *31/02;* **B01J** *19/08*

U.S. Cl. 423—445 B **13 Claims**

1. A method of producing fullerenes, comprising the steps of:

(a) disposing an axially extending carbonaceous anode having a tip end surface and a cathode having a cathode surface in an airtight chamber such that said tip end surface faces on said cathode surface;

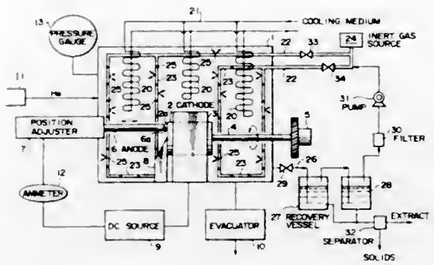
(b) introducing a first supply of inert gas into said airtight chamber to establish an atmosphere of a first inert gas therein;

(c) impressing a direct current voltage between said anode and said cathode while maintaining said chamber in the atmosphere of the first inert gas to cause an arc discharge to occur therebetween, so that soot containing fullerenes is accumulated in said chamber;

(d) then, after termination of step (c), blowing a second supply of inert gas on said accumulated soot to fluidize same;

(e) discharging said fluidized soot from said chamber; and

(f) introducing said discharged soot into a liquid containing a solvent capable of dissolving fullerenes, to thereby recover the fullerenes.



5,587,142

METHOD OF DISSOLVING METAL OXIDES WITH DI- OR POLYPHOSPHONIC ACID AND A REDUNDANT

Earl P. Horwitz, and Renato Chiarizia, both of Argonne, Ill., assignors to Arch Development Corporation, Chicago, Ill.

Continuation of Ser. No. 111,782, Aug. 25, 1993, abandoned, which is a continuation of Ser. No. 766,841, Sep. 27, 1991, abandoned, which is a division of Ser. No. 516,436, Apr. 30, 1990, Pat. No. 5,078,894. This application Jun. 6, 1995, Ser. No. 480,049

Int. Cl.[6] B01F *1/00;* **C01G** *56/00;37/00;* **C01F** *17/00*

U.S. Cl. 423—658.5 **22 Claims**

1. A method of dissolving a metal oxide comprising contacting the metal oxide with a composition comprising a di- or polyphosphonic acid and sodium formaldehyde sulfoxylate, each being present in sufficient amount to provide a synergistic effect with respect to the dissolution of the metal oxide, the composition optionally containing corrosion inhibitors and pH adjusting agents.

5,587,143

BUTYLENE OXIDE-ETHYLENE OXIDE BLOCK COPOLYMER SURFACTANTS AS STABILIZER COATINGS FOR NANOPARTICLE COMPOSITIONS

Sui-Ming Wong, Collegeville, Pa., assignor to NanoSystems L.L.C., Collegeville, Pa.

Filed Jun. 28, 1994, Ser. No. 267,082

Int. Cl.[6] A61K *49/00;49/04*

U.S. Cl. 424—9.1 **8 Claims**

1. A composition comprised of nanoparticles containing a therapeutic or diagnostic agent having a nonionic polymeric surfactant as a surface modifier adsorbed on the surface thereof, wherein said surfactant is a triblock copolymer having the structure

$$R-O-(CH_2CH_2O)_x-(CH_2-\underset{\underset{C_2H_5}{|}}{CH}O)_y-(CH_2CH_2O)_z-H$$

wherein

R is H,

x and y are 15–200, and

z is 5–200; and

said polymer has a molecular weight of 3,000–5,000 and comprises at least 60% by weight of ethylene oxide units.

5,587,144

DIAZINE CHELATING AGENTS FOR DIAGNOSTIC IMAGING

Torsten Almén, Malmö, Sweden; Arne Berg, Blommenholm, Norway; Harald Dugstad, Norway; Jo Klaveness, both of Oslo, Norway; Klaus D. Krautwurst, Stabekk, Norway, and Pål Rongved, Hellvik, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

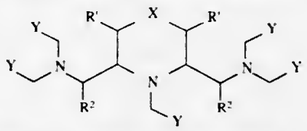
Division of Ser. No. 235,882, May 2, 1994, Pat. No. 5,439,668, which is a division of Ser. No. 690,975, Jul. 24, 1991, Pat. No. 5,348,954. This application Jun. 6, 1995, Ser. No. 467,287

Claims priority, application United Kingdom, Jan. 13, 1989, 8900719

Int. Cl.[6] A61B *5/055*

U.S. Cl. 424—9.361 **20 Claims**

1. A chelate complex of a compound of formula I



(I)

wherein X represents a group of formula NR^3;

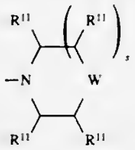
each R^1 which may be the same or different represents a hydrogen atom, a group of formula OR^3 or NR^3R^3 or a C_{1-8}alkyl or (C_{1-8}alkoxy)-C_{1-8}alkyl group optionally substituted by a hydroxyl group or by a group of formula NR^3R^3 or $CONR^3R^3$;

each R^2 which may be the same or different represents a hydrogen atom or a C_{1-8}alkyl or C_{1-8}alkoxy group optionally mono- or poly-substituted by hydroxyl or C_{1-8}alkoxy groups;

each R^3 which may be the same or different represents a hydrogen atom, an optionally mono- or poly-hydroxylated C_{1-8}alkyl group or a group of formula CH_2Y;

Y represents a group of formula COZ, $CON(OH)R^4$, POZ_2 or SO_2Z;

Z represents a group of formula OR^4, NR^4R^4, or



where each R^{11} which may the same or different is a hydrogen atom, a hydroxyl group or an optionally hydroxylated C_{1-8}alkyl group,

s is 0, 1 or 2, and

W is a group CHR^{11} or a group NR^{11}; and

each R^4 which may be the same or different represents a hydrogen atom or an optionally mono- or poly-hydroxylated C_{1-8}alkyl, (C_{1-8}alkoxy)-C_{1-8}alkyl or poly-(C_{1-8}alkoxy)-C_{1-8}alkyl group;

with the proviso that where s is 0 then in the resultant 5 membered heterocyclic ring W is a CHR^{11} group.

5,587,145

AQUEOUS AEROSOL LACQUER FOR SETTING HAIR

Bertrand Lion, Livry-Gargan; Jean Mondet, Drancy, and Christine Dupuis, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Feb. 14, 1994, Ser. No. 195,145

Claims priority, application France, Feb. 16, 1993, 93 01724

Int. Cl.[6] A61K *7/11;9/12*

U.S. Cl. 424—45 **15 Claims**

1. A water based aerosol hair lacquer containing in an aerosol container a homogeneous solution consisting essentially of:

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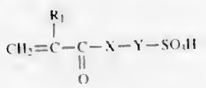
(a) 63 to 88% by weight of a carrier consisting of water,

(b) 10 to 35% by weight of a propellent consisting of dimethyl ether, and

(c) 2 to 25% by weight relative to the total weight of the lacquer of a water-soluble film-forming copolymer, said copolymer comprising repeating units resulting from the polymerization of:

(i) 30 to 90% by weight of an unsaturated sulphonic acid having the formula:



(I)

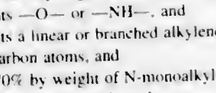
in which:

R_1 represents a hydrogen atom or $—CH_3$,

X represents —O— or —NH—, and

Y represents a linear or branched alkylene chain having from 1 to 6 carbon atoms, and

(ii) 10 to 70% by weight of N-monoalkylacrylamide or methacrylamide having the formula:



(II)

in which:

R_2 represents a hydrogen atom or $—CH_3$ and

R_3 represents a linear or branched radical having from 3 to 10 carbon atoms, the sulphonic acid functions of said copolymer being neutralized in a proportion from 40 to 70% with triethanolamine.

5,587,146

METHOD OF PREVENTING DEPOSITION OF TARTAR ON TEETH

Louis L. Wood, Rockville, and Gary J. Calton, Elkrigde, Md., assignors to Bayer AG, Leverkusen, Germany

Division of Ser. No. 994,922, Dec. 22, 1992, Pat. No. 5,408,028. This application Apr. 13, 1995, Ser. No. 421,482

Int. Cl.[6] A61K *7/16;7/22*

U.S. Cl. 424—49 **5 Claims**

1. A method of preventing deposition of tartar on teeth comprising treating said teeth with an effective amount of a copolymer of polyaspartic acid with a polycarboxylic acid.

5,587,147

AQUEOUS ZINC-POLYAMIDE COMPLEX SOLUTION

Todd W. Domke, Newtown, Pa., and Wolfgang R. Bergmann, Princeton, N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

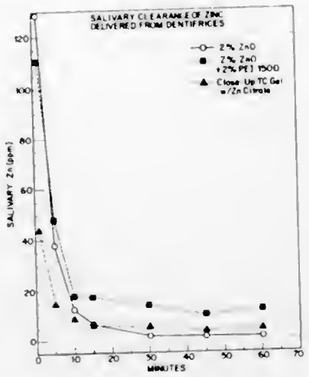
Filed Jun. 30, 1994, Ser. No. 269,155

The portion of the term of this patent subsequent to Jun. 30, 2014, has been disclaimed.

Int. Cl.[6] A61K *7/16;7/22*

U.S. Cl. 424—54 **6 Claims**

1. A single-phase aqueous solution comprising (1) about 0.1–12 weight percent of water-insoluble zinc compound ingredient selected from the group consisting of zinc oxide, zinc silicate, zinc carbonate, zinc stannate, zinc tetrafluoroborate, zinc citrate, zinc benzoate and zinc hexafluorosilicate; and (2) about 0.1–10 weight percent of water-soluble zinc-complexing polyalkylenamine polyamine ingredient; wherein the aqueous solution has a pH in the range between about 6–10.



5,587,148

VISIBLY TRANSPARENT UV SUNBLOCK AGENTS AND METHODS OF MAKING SAME

Kim Mitchell, Granada Hills, Calif., and Mark Mitchnick, Wainscott, N.Y., assignors to SunSmart, Inc., Wainscott, N.Y.

Continuation of Ser. No. 704,250, May 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 651,696, Feb. 5, 1991, Pat. No. 5,223,250. This application Aug. 4, 1993, Ser. No. 101,661

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—59 **9 Claims**

1. A topical sunblock formulation for shielding skin from ultra violet radiation, said formulation comprising:

a substantially colorless dermatologically acceptable liquid carrier;

micronized particles of zinc oxide, said particles having an average particle diameter of less than about 0.2 microns and containing

lead	<20 ppm;
arsenic	<3 ppm;
cadmium	<15 ppm, and
mercury	<1 ppm

said particles being substantially uniformly dispersed in said substantially colorless dermatologically acceptable liquid carrier to form a substantially visibly transparent topical sunblock formulation, said particles being dispersed in said carrier in an amount effective to shield skin over which said substantially visibly transparent topical sunblock formulation is applied from hazardous effects of UV-A and UV-B radiation.

5,587,149

TOPICAL APPLICATION EMULSIONS

Louis Punto, Clearwater; Chim Potini, Largo; Pilar Duque, and Eva Gould, both of Tampa, all of Fla., assignors to R.P. Scherer Corporation, Troy, Mich.

Filed Feb. 6, 1995, Ser. No. 383,782

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—59 **8 Claims**

1. A soft gelatin capsule comprising a shell and an emulsion for carrying vitamin C comprising:

first and second emulsion phases, and a dispersing agent;

said first emulsion phase including, as a solvent, polyethylene glycol, and vitamin C dissolved into said polyethylene glycol solvent; and

said second emulsion phase comprising a silicone-derivative silicone oil fluid.

5,587,150

PHOTOSTABLE COSMETIC SCREENING COMPOSITION CONTAINING A UV-A SCREENING AGENT AND AN ALKYL β, β-DIPHENYLACRYLATE OR α-CYANO-β, β-DIPHENYLACRYLATE

André Deflandre, Orry-la-Ville; Michel Dubois, Coulommiers; Serge Forestier, Claye-Souilly, and Hervé Richard, Paris, all of France, assignors to L'Oreal, Paris, France

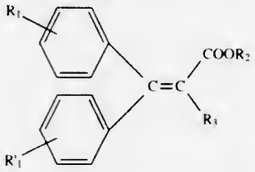
Continuation of Ser. No. 937,886, Oct. 14, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,842

Claims priority, application France, Feb. 14, 1990, 90 01761

Int. Cl.[6] A61K *7/42;7/40*

U.S. Cl. 424—59 **33 Claims**

1. A photostable cosmetic screening composition for protection of the human epidermis against ultraviolet rays of wavelengths between 280 and 380 nm, which comprises, in a cosmetically acceptable vehicle containing at least one fatty phase, 1 to 5% by weight of a dibenzoylmethane derivative and at least 1% by weight of an alkyl β, β-diphenylacrylate or a α-cyano-β,β-diphenylacrylate of formula:



(I)

in which

R_1 and R'_1, which may be identical or different, represent a hydrogen atom, a straight- or branched-chain C_1–C_8 alkoxy radical or a straight- or branched-chain C_1–C_4 alkyl radical, R_1 and R'_1 being in the para or meta position; R_2 represents a straight- or branched-chain C_1–C_{12} alkyl radical; and

R_3 represents hydrogen atom or a —CN radical, the mole ratio of the compound of formula (I) to the dibenzoylmethane derivative being not less than 0.8.

5,587,151

PHOTOPROTECTIVE/COSMETIC COMPOSITIONS COMPRISING OXANILIDO-SUBSTITUTED POLYORGANOSILOXANES/POLYORGANOSILANES

Hervé Richard, Villepinte; Madeleine Leduc, Paris, and Alain LaGrange, Couvray, all of France, assignors to L'Oreal, Paris, France

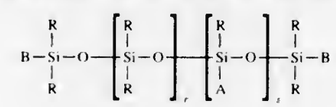
Filed Nov. 17, 1995, Ser. No. 560,489

Claims priority, application France, Nov. 17, 1994, 94 13770

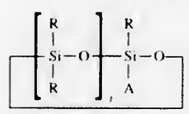
Int. Cl.[6] A61K *7/42;* **C08G** *77/26*

U.S. Cl. 424—59 **26 Claims**

1. An oxanilido-substituted polyorganosiloxane/polyorganosilane compound having one of the formulae (1) to (3):



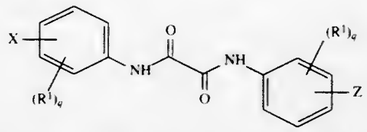
(1)



(2)

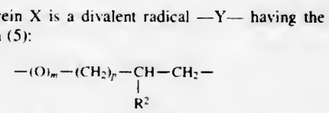
$A—Si(R')_3$ (3)

in which the radicals R, which may be identical or different, are each a C_1–C_{10} alkyl, phenyl or 3,3,3-trifluoropropyl radical, at least 80% by number of the radicals R being methyl radicals; the radicals B, which may be identical or different, are each a radical R or a radical A as defined below; the radicals R', which may be identical or different, are each a C_1–C_8 alkyl radical or a phenyl radical; r is an integer ranging from 0 to 50, inclusive, and s is an integer equal to 0 or 1, with the proviso that, if s is zero, then at least one of the two radicals B is a radical A; t is an integer ranging from 2 to 10, inclusive; and the radical A is a monovalent radical bonded directly to a silicon atom and which has the following formula (4):



(4)

wherein X is a divalent radical —Y— having the following formula (5):



(5)

in which R^2 is a hydrogen atom or a C_1–C_4 alkyl radical; p is an integer ranging from 0 to 10, inclusive; m is 0 or 1; the $—CH_2—$ endgroup is directly bonded to a silicon atom; Z is a hydrogen atom or a divalent radical —Y—; q is an integer ranging from 0 to 3 inclusive; and the radicals R^1, which may be identical or different, are each a C_1–C_8 alkyl radical or C_1–C_6 alkoxy radical, with the proviso that, when the radicals R^1 are alkoxy radicals, two adjacent radicals R^1 ($q \geq 2$) may together form an alkylidenedioxy group in which the alkylidene moiety contains 1 or 2 carbon atoms.

5,587,152

CLEAR SOLID TOPICAL DEODORANT COMPOSITIONS COMPRISING A WATER-INSOLUBLE ESTER OF A WATER-SOLUBLE ACID

Leonard Mackles, 311 E. 23rd St., New York, N.Y. 10010, and Leonard Chavkin, R.R. 1, Box 90, Bloomsbury, N.J. 08804

Continuation-in-part of Ser. No. 357,107, Dec. 15, 1994, abandoned. This application May 19, 1995, Ser. No. 444,443

Int. Cl.[6] A61K *7/32*

U.S. Cl. 424—65 **10 Claims**

1. A clear solid topical deodorant composition comprising:

50 to 98% by weight of at least one water-insoluble ester of a water-soluble acid having solubility in water of greater than 50% w/w at 20° C.,

2 to 6% by weight of dibenzylidine sorbitol, and

0 to 44% by weight of one or more optional ingredients, said composition being substantially free of water and of water-miscible solvents which are liquid at ambient temperature.

5,587,153

CLEAR, GELLED ALUMINUM AND ZIRCONIUM SALT CONTAINING ANTIPERSPIRANT FORMULATION

Philip P. Angelone, Jr., Wilmington; Nancy M. Karassik, Concord, and William R. Grace, Reading, all of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 592,570, Oct. 4, 1990, abandoned. This application Mar. 2, 1994, Ser. No. 204,898

Int. Cl.[6] A61K *7/34;7/38*

U.S. Cl. 424—66 **33 Claims**

1. An optically clear deodorant or antiperspirant product, comprising: a water-in-oil emulsion, said emulsion being a gel having a viscosity between about 50,000 cps and about 200,000 cps at 21° C. and a refractive index (n_D) in the range of 1.3975–1.4025, said emulsion having a water phase that makes up between seventy-five to ninety percent of said emulsion, with a deodorant or antiperspirant effective salt of aluminum and zirconium dissolved in said water phase and an oil phase.

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5,587,154

SHAMPOO COMPOSITIONS AND SUSPENDING AGENT THEREFOR

Teresa J. Dowell, Downers Grove; Gerald P. Newell, Hoffman Estates, and Eugene Zeffren, Lincolnshire, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Division of Ser. No. 969,382, Oct. 30, 1992, Pat. No. 5,393,519, which is a continuation of Ser. No. 859,128, Mar. 27, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,192

Int. Cl.[6] A61K *7/06;* **C11D** *3/48;9/50*

U.S. Cl. 424—70.11 **20 Claims**

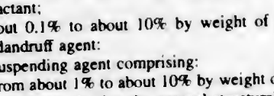
1. An antidandruff shampoo composition comprising:

(a) about 3% to about 40% by weight of an anionic cleansing surfactant;

(b) about 0.1% to about 10% by weight of a water-insoluble antidandruff agent;

(c) a suspending agent comprising:

(i) from about 1% to about 10% by weight of the composition of an amine having the general structural formula



wherein R_1 is an alkyl group including at least 16 carbon atoms; R_2 is selected from the group consisting of hydrogen, an alkyl group having one to about 22 carbon atoms, benzyl and phenyl; and R_3 is selected from the group consisting of hydrogen, methyl, benzyl, and phenyl, wherein said amine has a water solubilty of 0 to 0.5 grams per 100 milliliters of water, and wherein said amine is a solid compound at room temperature; and

(ii) a sufficient amount of an acid such that essentially no solid particles of the amine are present in the composition, said acid selected from the group consisting of an inorganic mineral acid, an aliphatic carboxylic acid including up to about 22 carbon atoms; an aromatic carboxylic acid, and combinations thereof; and

(d) an aqueous carrier.

5,587,155

HAIR COSMETIC COMPOSITION

Ryuji Ochiai, Ichikawa; Kouzi Morita, Mitaka, and Kazuyuki Yahagi, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP93/00980, § 371 Date Jan. 18, 1995, § 102(e) Date Jan. 18, 1995, PCT Pub. No. WO94/02111, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 14, 1993, Ser. No. 367,228

Claims priority, application Japan, Jul. 21, 1992, 4-194122; Feb. 9, 1993, 5-021456

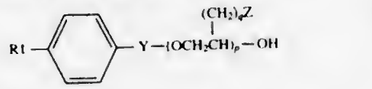
Int. Cl.[6] A61K *7/06;7/00*

U.S. Cl. 424—70.28 **5 Claims**

1. A hair cosmetic composition comprising:

(a) at least one compound selected from the group consisting of fatty acids containing a linear or branched alkyl or alkenyl group having 18–25 carbon atoms, salts of fatty acids containing a linear or branched alkyl or alkenyl group having 18–25 carbons and fatty acid esters formed from fatty acids containing a linear or branched alkyl or alkenyl group having 18–25 carbon atoms and a polyhydric alcohol;

(b) at least one aromatic alcohol of formula (1):



(1)

wherein

R^1 is a hydrogen atom, a methyl group or methoxy group;

Y is a single bond or a linear or branched alkylene or alkenylene group having 1–3 carbon atoms;

Z is a hydrogen atom or a hydroxyl group; and

p and q stand individually for a number of 0–5; and

(c) at least one quaternary ammonium salt cationic surfactant, wherein the components (a), (b) and (c) are contained in proportions of 0.5–10 wt. %, 1–30 wt % and 0.2–10 wt %, respectively, based on the weight of the hair cosmetic composition.

5,587,156

SHAVING COMPOSITIONS CONTAINING PARTICULATE ADDITIVES

Mark S. Wdowik, Ft. Collins, Colo., assignor to Critical Dimension, Incorporated, Ft. Collins, Colo.

Filed Apr. 18, 1996, Ser. No. 634,602

Int. Cl.[6] A61K *7/09;* **A01N** *37/00*

U.S. Cl. 424—73 **21 Claims**

1. Shaving compositions for use in the personal shaving process with a razor blade assembly, which shaving compositions provide physical, microscopic support for the blade of such a razor blade assembly during the personal shaving process including:

a mixture of at least one wetting agent, at least one cleansing agent, at least one lather producing composition, and at least one emollient; and further including

at least one solid, insoluble particulate additive in a well dispersed suspension throughout said shaving composition, said solid additives present in an effective amount to produce physical support for the blade of a razor blade assembly during the personal shaving process.

5,587,157

STABILIZATION OF BIOWASTES

James P. Cox, and Robert W. Duffy Cox, both of 246 E. Bartlett Rd., Lynden, Wash. 98264

Continuation-in-part of Ser. No. 287,183, Aug. 8, 1994, abandoned, which is a continuation of Ser. No. 886,417, May 19, 1992, Pat. No. 5,352,444. This application Jun. 7, 1995, Ser. No. 474,329

Int. Cl.[6] A61L *11/00*

U.S. Cl. 424—76.5 **54 Claims**

1. A biowaste treatment agent consisting essentially of a metal component and an aldehyde, said treatment agent lacking a surfactant;

said metal component comprising from about 0.5% to about 85.0% by weight of the treatment agent; and

said aldehyde comprising about 0.1% to about 80.0% by weight of the treatment agent.

5,587,158

BIOLOGICAL CONTROL FOR WEED TREES

Ronald Wall; Raghubir Prasad, both of Victoria, and Elaine Sela, Shawnigan Lake, all of Canada, assignors to Minister of Natural Resources, Canadian Forest Service, Hull, Canada

Filed Mar. 27, 1995, Ser. No. 411,334

Int. Cl.[6] A01N *25/00;63/00;* **C12N** *1/00;1/14*

U.S. Cl. 424—93.5 **3 Claims**

1. A refrigeration storable preparation of *Chondrostereum purpureum* fungus for the control of weed trees selected from the group consisting of aspens, beech, birches, maples, pin cherry and poplars comprising:

(a) a dry culture medium consisting of 90–95% by weight finely powdered inert material, approximately 3–5% by weight digestible carbohydrates, approximately 0.1–1.0% by weight of an organic nitrogen source capable of providing approximately 0.01–0.10% by weight available nitrogen; and 0.5–1% by weight vitamin;

(b) water in an amount to maintain a moisture level of 15–25% by weight based on the dry weight of the culture medium for maintaining living mycelium of the fungus without promoting excessive growth or free moisture; and

(c) viable mycelium of *Chondrostereum purpureum* in an amount of 1–5% by weight based on the dry weight of the culture medium.

5,587,159

HUMAN TISSUE PLASMINOGEN ACTIVATOR

David V. Goeddel, Hillsborough; William J. Kohr, San Mateo; Diane Pennica, Foster City, and Gordon A. Vehar, San Carlos, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 109,698, Aug. 20, 1993, abandoned, which is a continuation of Ser. No. 911,021, Jul. 9, 1992, abandoned, which is a continuation of Ser. No. 489,855, Mar. 2, 1990, Pat. No. 5,185,259, which is a continuation of Ser. No. 12,694, Feb. 9, 1987, abandoned, which is a division of Ser. No. 483,052, Apr. 7, 1983, Pat. No. 4,766,075, which is a continuation-in-part of Ser. No. 398,003, Jul. 14, 1982, abandoned, and Ser. No. 374,860, May 5, 1982, abandoned. This application Jun. 21, 1994, Ser. No. 264,134

Int. Cl.[6] A61K *38/49;* **C12N** *9/64;15/15;15/70*

U.S. Cl. 424—94.64 **4 Claims**

1. Human tissue plasminogen activator as produced by recombinant expression of DNA encoding said tissue plasminogen activator in transformed *E. coli.*

5,587,160

Patent Not Issued For This Number

5,587,161

PRODRUGS FOR ANTIBODY DIRECTED ENZYME PRODRUG THERAPY

Philip J. Burke, Charlton; Robert I. Dowell, Congleton, both of United Kingdom; Anthony B. Mauger, Kensington, Md., and Caroline J. Springer, London, United Kingdom, assignors to Zeneca Limited, and Cancer Research Campaign Technology Limited, both of London, England

Division of Ser. No. 94,952, Jul. 22, 1993, Pat. No. 5,405,990. This application Dec. 21, 1994, Ser. No. 361,424

Claims priority, application United Kingdom, Jul. 23, 1992, 9215636; May 26, 1993, 9310884

Int. Cl.[6] A61K *39/395;* **C07K** *16/00;* **C07C** *261/00;* **C07F** *9/02*

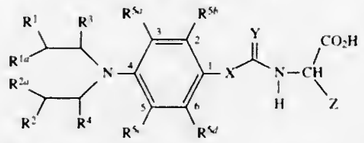
U.S. Cl. 424—178.1 **21 Claims**

1. A two component system, each component for use in association with the other, which comprises:

(i) a first component that is an antibody or fragment thereof capable of binding a given antigen, the antibody or fragment thereof being conjugated to a carboxypeptidase G enzyme capable of converting a compound of Formula I or physiologically acceptable salt thereof into a cytotoxic drug; and

(ii) a second component that is a compound of Formula I or a physiologically acceptable salt thereof convertible under the influence of the carboxypeptidase G enzyme to the cytotoxic drug,

said compound of Formula I having the structure:



Formula I

wherein

R^1 and R^2 each independently represents chlorine, bromine, iodine, OSO_2Me, or OSO_2phenyl (wherein phenyl is optionally substituted with 1, 2, 3, 4 or 5 substituents independently selected from C_{1-4}alkyl, halogen, —CN and —NO_2);

R^{1a} and R^{2a} each independently represents hydrogen, C_{1-4}alkyl or C_{1-4}haloalkyl;

R^3 and R^4 each independently represents hydrogen, C_{1-4}alkyl or C_{1-4}haloalkyl;

R^{5a}, R^{5b}, R^{5c} and R^{5d} each independently represents hydrogen, C_{1-4}alkyl optionally containing one double bond or one triple bond, C_{1-4}alkoxy, halogen, cyano, —NH_2, —$CONR^7R^8$ (wherein R^7 and R^8 are as defined below), —NH(C_{1-4}-alkyl), —N(C_{1-4}-alkyl)$_2$ and C_{2-5}alkanoyl; or R^{5a} and R^{5b} together represent

a) C4 alkylene optionally having one double bond;

b) C3 alkylene; or

c) —CH=CH—CH=CH—, —CH=CH—CH_2 or —CH_2—CH=CH— each optionally substituted with 1, 2, 3 or 4 substituents said substituents each independently selected from the group consisting of C_{1-4}alkyl, C_{1-4}alkoxy, halogen, cyano, nitro, C_{2-5}alkanoyl and —$CONR^7R^8$ (wherein R^7 and R^8 are as defined below);

X represents O or NH;

Y represents O;

Z represents —V—W where V is —CH_2—T— in which T is —CH_2—, —O—, —S—, —(SO)—, or —(SO_2)— (provided that when V has sulphur or oxygen as its second atom, W is other than —COOH) and said group V optionally further carrying one or two substituents Q^1 and/or Q^2 on carbon; wherein Q^1 and Q^2 each independently represents C_{1-4}alkyl or halogen, or, when Q^1 and Q^2 are bonded to adjacent carbon atoms, Q^1 and Q^2 together may additionally represent a C_3–C_4alkylene radical optionally substituted with 1, 2, 3 or 4 substituents independently selected from the group consisting of C_{1-4}alkyl and halogen; and

W represents

(1) COOH,

(2) —(C=O)—O—R^6 wherein R^6 represents C_{1-6}alkyl, C_{3-6}cycloalkyl or aryl (as defined in 3 below) group;

(3) —(C=O)—NR^7R^8 wherein R^7 and R^8 each independently represent hydrogen or a C_{1-6}alkyl, C_{3-6}cycloalkyl, aryl, heteroaryl linked to N via carbon or C_{7-9}aralkyl group wherein aryl is phenyl; heteroaryl is a 5 or 6 membered ring containing 1 to 3 heteroatoms selected from the group consisting of nitrogen and sulphur; the aryl moiety per se, the heteroaryl moiety and the aryl moiety of the aralkyl group may be substituted on carbon with 1–4 substituents selected from the group consisting of —COOH, —OH, —NH_2, —CH_2—NH_2, —$(CH_2)_{1-4}$—COOH, tetrazol-5-yl and —SO_3H and the alkyl moiety may optionally carry a methyl group;

(4) —SO_2NHR^9 wherein R^9 is as defined for R^7 but may additionally represent —CF_3, —CH_2CF_3 or aryl as defined above;

(5) SO_3R^{10} in which R^{10} represents H, C_{1-6}alkyl or C_{3-6}cycloalkyl,

(6) $PO_3R^{10}R^{10}$ (wherein the R^{10} radicals, which may be the same or different, are as herein defined)

(7) a tetrazol-5-yl group

(8) —CONH—SO_2R^{11} in which R^{11} represents

(a) C_{3-7}cycloalkyl;

(b) C_{1-6}-alkyl optionally substituted with substituents selected from the group consisting of aryl as defined below, C_{1-4}alkyl, CF_3 or halogen; and

(c) perfluoro-C_{1-6}alkyl; wherein aryl is phenyl or phenyl having 1–5 substituents wherein the substituents are selected from the group consisting of halogen, —NO_2, —CF_3, C_{1-4}alkyl, C_{1-4}alkoxy, —NH_2, —$NHCOCH_3$, —$CONH_2$, —OCH_2COOH, —NH(C_{1-4}alkyl), —N(C_{1-4}alkyl)$_2$, —$NHCOOC_{1-4}$alkyl, —OH, —COOH, —CN and —$COOC_{1-4}$alkyl; and

(9) —M—Het wherein M represents S, SO or SO_2 and Het represents a 5 or 6 membered heterocyclic aromatic ring linked to M via a carbon atom of the aromatic ring, said aromatic ring containing 1, 2, 3 or 4 heteroatoms selected from the group consisting of O, N and S said aromatic ring optionally being substituted on carbon atoms of the ring

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with 1, 2, 3 or 4 substituents selected from the group consisting of —OH, —SH, —CN, —CF_3, NH_2 and halogen; or

salts of said compound of formula I.

5,587,162

TREATMENT OF ALLOGRAFT REJECTION WITH IL-2 RECEPTOR-SPECIFIC CYTOTOXINS

Terry B. Strom, Brookline, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Continuation of Ser. No. 275,010, Jul. 8, 1994, Pat. No. 5,510,105, which is a division of Ser. No. 842,463, Feb. 27, 1992, Pat. No. 5,336,489, which is a continuation of Ser. No. 692,830, Apr. 26, 1991, abandoned, which is a continuation of Ser. No. 492,616, Mar. 12, 1990, abandoned, which is a continuation of Ser. No. 772,893, Sep. 5, 1985, Pat. No. 5,011,684. This application Jun. 6, 1995, Ser. No. 471,841

Int. Cl.[6] A61K *38/20;39/395;45/00*

U.S. Cl. 424—183.1 **20 Claims**

1. A method of inhibiting the T-lymphocyte induced rejection of an allograft in a mammal, wherein said rejection is characterized by a proliferative burst of IL-2 receptor-bearing T-lymphocytes, comprising the step of administering to said mammal during said proliferative burst a cytotoxin linked to an IL-2 receptor-specific substance, such that the cytotoxin is internalized by said T-lymphocytes, resulting in the death of said T-lymphocytes.

5,587,163

LIQUID MIXTURE FOR INTERNAL USE, FOR PROPHYLACTIC HEALTH PROTECTION

Bernd Latta, Im Siekerfeld 1, D-33604 Bielefeld, Germany

Filed Jan. 20, 1995, Ser. No. 375,964

Claims priority, application Germany, Jan. 20, 1994, 9400883 U; Feb. 10, 1994, 9402223 U

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. A liquid mixture for internal use for prophylactic health protection, based on the active ingredients of biological natural products, comprising:

a mixture of liquid brewer's yeast and a juice selected from the group consisting of the juice pressed from grasses, herbs, fruits, roots, vegetables, seeds and germs; and

a substantially inert liquid diluting said mixture.

5,587,164

PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS ANTIGEN AND PROCESSES FOR THE PREPARATION AND USE OF SAID ANTIGEN IN VACCINES AND DIAGNOSTICS

Thomas Sanderson, Ames, Iowa; Michael J. McGinley, Lenexa, Kans.; Jeffrey J. Zimmerman, Ames, Iowa; Howard T. Hill, Cambridge, Iowa; Michael C. Meetz, Nevada, Iowa; Eugene C. Pirtle, Ames, Iowa; Sabrina L. Swenson, Madrid, Iowa, and George P. Shibley, Leawood, Kans., assignors to Bayer Corporation, Pittsburgh, Pa., and Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 14,915, Feb. 8, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 349,865

Int. Cl.[6] A61K *39/00;39/38;39/12;39/193*

U.S. Cl. 424—218.1 **3 Claims**

1. A vaccine prepared by the process of growing a porcine reproductive and respiratory syndrome virus (PRRSV) in a tissue which is susceptible to infection and replication of PRRSV to an amount sufficient to protect animals against PRRS comprising inoculating the PRRSV onto tissue cells and harvesting the replicated virus, releasing the virus from the tissue cells and adjusting the virus antigenic mass by dilution, concentration or extraction to produce an immunologically effective amount of the antigenic mass for a modified live or inactivated formulation of the vaccine wherein the PRRSV is an isolate designated as ISU-P and having an Accession number ATCC VR 2402.

5,587,165

Patent Not Issued For This Number

5,587,166

VACCINE AGAINST PASTEURELLA

William Donachie, East Calder, Scotland, assignor to British Technology Group Limited, London, England

Continuation of Ser. No. 106,720, Aug. 16, 1993, abandoned, which is a continuation of Ser. No. 168,960, Mar. 16, 1988, abandoned. This application Apr. 24, 1995, Ser. No. 427,692

Claims priority, application United Kingdom, Mar. 24, 1987, 8706944; Sep. 10, 1987, 8721286

Int. Cl.[6] A61K *39/02;39/102*

U.S. Cl. 424—255.1 **15 Claims**

1. A vaccine comprising an effective amount of killed whole cells of *Pasteurella haemolytica* grown under iron-restriction conditions in vitro, together with an adjuvant.

5,587,167

PHARMACEUTICAL COMPOSITION FOR PROPHYLAXIS AND TREATMENT OF PREMATURE EJACULATION

Hyung K. Choi, 10-71, Sambu Apt., Yoido-dong, Youngdeungpo-gu, Seoul, Rep. of Korea, and Zhong C. Xin, 5, Guiping Hutong, Beisan Street,Chuaying District, JiLin City, JiLin Province, China

Continuation-in-part of Ser. No. 175,564, Dec. 30, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 304,855

Claims priority, application Japan, Sep. 14, 1993, 93-18467

Int. Cl.[6] A61K *35/56;35/78*

U.S. Cl. 424—195.1 **14 Claims**

1. A topical pharmaceutical composition for treatment of premature ejaculation, comprising a member selected from the group consisting of a dried alcohol extract, an aqueous extract, and a combination of a dried alcohol extract and an aqueous extract of 60 to 140 parts by weight raw ginseng radix, 60 to 140 parts by weight angelicae gigantis radix, 60 to 140 parts by weight broomrape, 10 to 30 parts by weight cassiae cortex, 10 to 30 parts by weight asiasari radix, 60 to 140 parts by weight cnidium fructus, 40 to 70 parts by weight xanthoxyli fructus, 10 to 30 parts by weight caryophylli flos and 15 to 25 parts by weight bufonis venenum, and a pharmaceutically acceptable carrier, adjuvant or excipient therefor.

5,587,168

COSMETIC PREPARATIONS

Ilana Vanonou, 3300 NE. 192nd St., Aventura, Fla. 33180

Filed May 16, 1994, Ser. No. 243,485

Int. Cl.[6] A61K *7/46*

U.S. Cl. 424—401 **3 Claims**

1. A cosmetic preparation which is a transparent medium of fragrance or perfume consisting essentially of a fragrant substance selected from the group consisting of a natural extract of flowers, herbs, leaves, roots, barks, wood, blossoms, plants, and mixtures thereof, and 0.1 to less than 5% by volume of finely divided yellow gold; wherein said yellow gold flakes are of a size such that when said cosmetic preparation is applied to the skin said yellow gold flakes will disappear or be essentially invisible to the unaided eye, said yellow gold flakes being visible in said transparent medium and when said cosmetic preparation is shaken said yellow gold flakes will float throughout said transparent medium and eventually settle by gravitational forces.

5,587,169

COSMETIC OR PHARMACEUTICAL COMPOSITION COMPRISING AN ALKYL CARBAMATE AS HYDRATING AGENT

Michel Philippe, Wissous; Didier Semeria, Courtry, and Eric Bollens, Saint Maurice, all of France, assignors to L'Oréal, Paris, France

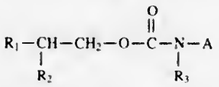
Filed Apr. 13, 1995, Ser. No. 421,065

Claims priority, application France, Apr. 13, 1994, 94 04377

Int. Cl.[6] A61K *7/48;7/50;7/075*

U.S. Cl. 424—401 **13 Claims**

1. A cosmetic or pharmaceutical composition comprising at least one hydrating agent corresponding to the formula (I):



(I)

wherein:

R_1 represents an alkyl or alkenyl radical having from 4 to 18 carbon atoms,

R_2 represents an alkyl or alkenyl radical having from 2 to 16 carbon atoms,

R_3 represents a hydrogen atom or an alkyl radical having from 1 to 6 carbon atoms, and

A represents a nonionic hydroxylated group.

5,587,170

COLLOIDAL SUSPENSION BASED ON INORGANIC FILLERS AS A COSMETIC COMPOSITION

Laurence Caisey, Vitry-sur-Seine, and Jean M. Sturla, Saint-Cloud, both of France, assignors to L'Oreal, Paris, France

Filed Apr. 28, 1995, Ser. No. 430,741

Claims priority, application France, Apr. 28, 1994, 94 05181

Int. Cl.[6] A61K *7/00;7/02*

U.S. Cl. 424—401 **12 Claims**

1. Process for cosmetic treatment of the skin, hair and/or nails, comprising applying a colloidal suspension containing, in a cosmetic medium consisting of water, a water/alcohol mixture or an alcohol, metal salts or oxides in the form of particles having a refractive index greater than or equal to approximately 1.9 or between 1.3 and 1.6 inclusive on the skin, hair and/or nails in order to form, after evaporation of the cosmetic medium of the suspension, a film of the metal salts or oxides which modifies the reflective properties of the skin, hair and/or nails.

5,587,171

COSMETIC OF DERMOPHARMACEUTICAL COMPOSITION CONTAINING, IN COMBINATION, A LAUROYLMETHIONATE OF A BASIC AMINO ACID AND AT LEAST ONE POLYPHENOL

Quang L. N'Guyen, Antony, France, assignor to L'Oreal, Paris, France

Division of Ser. No. 136,832, Oct. 18, 1993, Pat. No. 5,431,912. This application May 26, 1995, Ser. No. 452,376

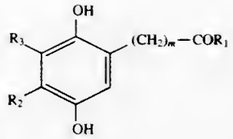
Claims priority, application France, Oct. 22, 1992, 92 12654

Int. Cl.[6] A61K *7/02*

U.S. Cl. 424—401 **11 Claims**

1. A cosmetic or dermatological composition containing, in a suitable vehicle, an antioxidizing system possessing a synergic effect consisting of the combination of a lauroylmethionate of lysine, histidine or arginine and at least one polyphenol selected from the group consisting of:

(i) a derivative of (2,5-dihydroxyphenyl) carboxylic acid having the following formula:



(I)

in which:

R_1 represents OR_4, OH or

R_4 represents a linear or branched C_1–C_{20} alkyl radical, a linear or branched C_2–C_{20} alkenyl radical or a C_1–C_{20} alkyl radical substituted by at least one hydroxyl or alkoxyl group,

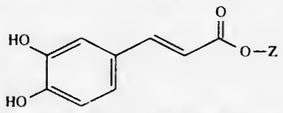
r' and r", which are identical or different, represent a hydrogen atom, a C_1–C_{20} alkyl radical, a C_2–C_6 hydroxyalkyl radical or a C_3–C_6 polyhydroxyalkyl radical,

m is 1 or 2,

(i) when m is 1, at least one of the R_2 and R_3 radicals represents a linear or branched C_1–C_4 alkyl radical, the other optionally representing a hydrogen atom,

(ii) when m is 2, R_2 and R_3, which are identical or different, represent a hydrogen atom or a linear or branched C_1–C_4 alkyl radical,

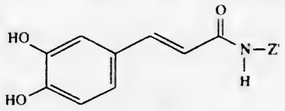
(ii) an ester of caffeic acid having the formula:



(II)

in which Z represents a C_1–C_8 alkyl or the residue of a phytol,

(iii) an amide of caffeic acid having the formula:

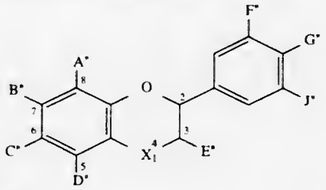


(III)

in which Z' represents a C_1–C_8 alkyl,

(iv) a flavonoid or an extract containing flavonoids, said flavonoid being selected from the group consisting of:

(a) a flavonoid having the formula:

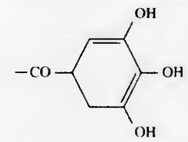


(IV)

in which:

A", B", C" and D", independently of one another, represent H or OH;

E" represents H, OH or OX', where X' represents:



F", G", J" represent, independently of one another, H or OH; and

X_1 represents —CH_2—, —CO— or —CHOH—.

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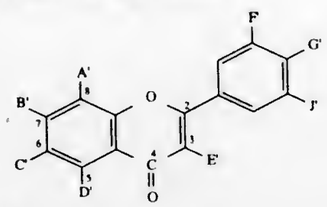
with the proviso that at least two of the radicals A" to G" and J" represent OH or that the E" radical represents OX', and

(b) a flavonoid having the formula:

(V)



in which:

A', C' and D', independently of one another, represent H, OH or OCH_3;

E' represents H, OH or OR', where R' represents the residue of rutinose,

B', F', G' and J', independently of one another, represents H, OH, OCH_3 or $—OCH_2—CH_2—OH$,

with the proviso that at least two of the radicals A' to G' or J' represent OH, and

(v) mixtures thereof.

5,587,172

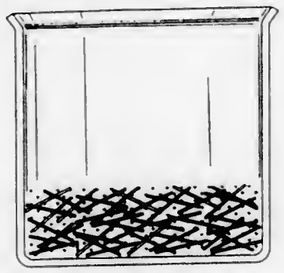
PROCESS FOR FORMING QUICKLY DISPERSING COMESTIBLE UNIT AND PRODUCT THEREFROM

Subraman R. Cherukuri, Towner, N.J.; Garry L. Myers; Gerald E. Battist, both of Reston, Va., and Richard C. Fuisz, Great Falls, Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Division of Ser. No. 259,258, Jun. 14, 1994, which is a continuation-in-part of Ser. No. 133,669, Oct. 7, 1993, and Ser. No. 119,974, Sep. 10, 1993, Pat. No. 5,518,551. This application May 26, 1995, Ser. No. 452,666

Int. Cl.[6] A61K *9/20*

U.S. Cl. 424—401 **23 Claims**



1. A comestible unit which disperses quickly in the mouth prepared from the process comprising:

a) subjecting to flash-flow processing a feedstock comprising a carbohydrate capable of undergoing flash-flow processing without use of a solution to provide a shearform matrix:

b) initiating crystallization of said shear/form matrix:

c) forming flowable compactible micro-particulates by combining an additive with said shearform matrix; and

d) compacting said micro-particulates resulting from step "c," which comprises at least partially crystallized shearform matrix, to form said unit.

5,587,173

UTILIZATION OF DERIVATIVES OF 2,5 DIHYDROXYPHENYL-CARBOXYLIC ACID AMIDES AND THEIR SALTS IN PREPARATION OF A COSMETIC OR DERMATOLOGICAL COMPOSITION WITH A DEPIGMENTING ACTION

Alex Junino, Livry Gargan; Alain LaGrange, Chatou; Quang L. N'Guyen, Antony, and Marie-Alix Bourboulon, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 913,950, Jul. 17, 1992, Pat. No. 5,449,518. This application Jun. 5, 1995, Ser. No. 465,105

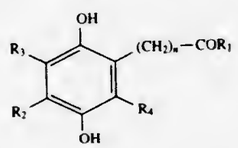
Claims priority, application France, Jul. 17, 1991, 91 09029

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—401 **7 Claims**

1. A method of cosmetic or dermatological treatment of skin comprising applying to skin to be depigmented a composition comprising in a suitable vehicle for topical application to the skin 2,5-dihydroxyphenylcarboxylic acid derivatives having the following formula:

(I)



wherein:

R_1 represents

r' and r", identical or different, represent a hydrogen atom, a C_1–C_{20} alkyl radical, a C_2–C_6 hydroxyalkyl radical, or C_3–C_6 polyhydroxyalkyl radical, or r' and r" taken together, with the nitrogen atom, form a heterocycle selected from the group consisting of morpholino, pyrrolidino, piperidino, piperazino and piperazino substituted by C_1–C_4 alkyl or C_2–C_6 hydroxyalkyl;

the number of carbon atoms in the $—(CH_2)_n—COR_1$ chain is less than or equal to 21;

R_2 and R_3, identical or different, represent a hydrogen atom, a linear or branched C_1–C_4 alkyl radical, or a C_1–C_4 alkoxy;

R_4 represents a hydrogen atom or a linear or branched C_1–C_4 alkyl radical; and

n is an integer from 0 to 20, provided that, when R_2 and R_3 represent a hydrogen atom, n is greater than or equal to 2, and salts thereof.

5,587,174

COSMETIC COMPOSITION FOR TREATING SKIN AND HAIR CONTAINING APPLE WAX AND METHODS OF MAKING THEM

Günther Lang, Reinheim; Dieter Hoch, Pfungstadt-Eich; Eugen Konrad, Darmstadt; Wolfram Geibel, Hünfeld; Harald Wendel, Ober-Ramstadt, and Thomas Kripp, Fränkisch-Crumbach, all of Germany, assignors to Wella Aktiengsellschaft, Darmstadt, Germany

Continuation of Ser. No. 122,609, Sep. 30, 1993, abandoned. This application Feb. 12, 1996, Ser. No. 598,632

Claims priority, application Germany, Feb. 28, 1992, 42 06 154.7

Int. Cl.[6] A61K *7/00;7/021;7/06*

U.S. Cl. 424—401 **3 Claims**

1. Composition for treating skin and hair, said composition consisting of 0.5 to 2 percent by weight of apple wax, 0.1 to 30 percent by weight of at least one surfactant, a solvent selected from the group consisting of water, ethanol, propanol, isopropanol, glycols and mixtures thereof and at least one additive selected from the group consisting of perfume oils; opacifiers; pearlescing agents; bacterial and fungicidal ingredients; coconut fatty acid diethanolamide; buffer substances; coloring materials; solubilizers; light stabilizers; antioxidants; complexing agents and antidandruff active ingredients.

5,587,175

MEDICAL USES OF IN SITU FORMED GELS

Tacey X. Viegas, Canton; Lorraine E. Reeve, Dexter, and Raymond L. Henry, Grosse Pointe Woods, all of Mich., assignors to MDV Technologies, Inc., Dearborn, Mich.

Division of Ser. No. 785,305, Oct. 30, 1991, Pat. No. 5,318,780. This application Dec. 28, 1993, Ser. No. 174,101

Int. Cl.[6] A61K *31/77;31/725;31/73;2/14*

U.S. Cl. 424—427 **11 Claims**

1. A process for forming a protective corneal shield or an ablatable corneal shield or mask in situ comprising administering to the eye of a mammal an aqueous composition capable of being gelled in situ to produce an hyperosmotic, hypoosmotic, or isoosmotic aqueous gel having a controlled pH, said aqueous composition, including at least one film forming polymer; and gelling said film forming polymer in situ to form said protective corneal shield or ablatable corneal shield or mask.

5,587,176

METHODS OF USING HESPERETIN FOR SEBUM CONTROL AND TREATMENT OF ACNE

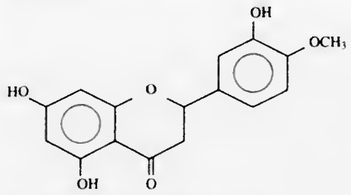
Raphael Warren, Amberly Village, and Adebola T. Akadiri, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 49,923, Apr. 20, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,906

Int. Cl.[6] A61K *9/70*

U.S. Cl. 424—443 **16 Claims**

1. A method of treating acne in mammalian skin comprising administering to a mammal susceptible to or having acne a composition consisting of a safe and effective amount of hesperetin having the structure:



or a pharmaceutically-acceptable salt thereof.

5,587,177

MEDICAMENT HAVING A PEDIATRIC PRESENTATION FOR FACILITATING THE INGESTION THEREOF BY A CHILD

Georges S. Grimberg, 123 rue de l' Universite', 75007 Paris, France

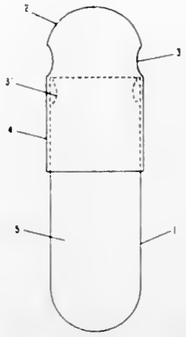
Filed Jan. 23, 1995, Ser. No. 376,837

Claims priority, application France, Jan. 21, 1994, 94 00639

Int. Cl.[6] A61K *9/48*

U.S. Cl. 424—454 **4 Claims**

1. The combination of a medicament with a capsule, said combination having a pediatric presentation facilitating ingestion of the medicament by a child, the medicament being an anhydrous powder mixable with food so as to be easily ingested by a child, wherein said capsule contains a unit dose of the medicament and is



formed by a small container comprising a cup-shaped bottom with a top portion, a cup-shaped cover having a shape matching the shape of said cup-shaped bottom, and a flexible strip for connecting said top portion to said cover, said capsule further comprising a catch for maintaining said cover on said cup-shaped bottom, said catch being comprised of a step at said cup-shaped bottom and a matching step at said cup-shaped cover catching said step of said cup-shaped bottom, wherein by pressing on said cup-shaped bottom said catch is released for opening said capsule, wherein said capsule once open cannot be closed again.

5,587,178

PROCESS FOR THE TREATMENT OF ASPARTAME

Hubertus J. M. Slangen, Stein, Netherlands, assignor to Holland Sweetner Company V.o.F., Maastricht, Netherlands

Continuation-in-part of Ser. No. 74,446, Jun. 10, 1993, Pat. No. 5,411,747. This application Dec. 7, 1994, Ser. No. 351,579

Claims priority, application Netherlands, Jun. 11, 1992, 9201029

Int. Cl.[6] A61K *9/20*

U.S. Cl. 424—464 **15 Claims**

1. A tablet comprising aspartame, obtained by direct compression tableting aspartame particles, wherein at least 94 wt. % of said aspartame particles are in a particle size distribution range of 20 μm to 250 μm.

5,587,179

PHARMACEUTICAL FORMULATION IN THE FORM OF AN EFFERVESCENT AND/OR DISINTEGRATING TABLET OR OF INSTANT GRANULATE, AND PROCESS FOR THEIR PREPARATION

Gerhard Gergely; Thomas Gergely, and Irmgard Gergely, all of Vienna, Austria, assignors to Gerhard Gergeky, Austria

PCT No. PCT/EP93/00055, § 371 Date Jul. 13, 1994, § 102(e) Date Jul. 13, 1994, PCT Pub. No. WO93/13760, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 12, 1993, Ser. No. 256,503

Claims priority, application European Pat. Off., Jan. 13, 1992, 92100441

Int. Cl.[6] A61K *9/46*

U.S. Cl. 424—466 **17 Claims**

1. Pharmaceutical formulation in the form of an effervescent or disintegrating tablet or of instant granules, containing at least one active ingredient having an irritating taste and at least one matrix which delays the release of the active ingredient and which contains at least one fatty ester or one wax, characterised in that the matrix is present as an intimate mixture with the active ingredient particles and covers said particles and is applied to a carrier, the formulation releasing at most 65% of the active ingredient in aqueous solution at room temperature within about 2 min but more than 70% of the active ingredient within max. 20 min in 0.1N HCl at 38° C.

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5,587,180

PROCESS FOR MAKING A PARTICULATE SUPPORT MATRIX FOR MAKING A RAPIDLY DISSOLVING TABLET

Loyd V. Allen, Jr., Edmond, and Bingnan Wang, Oklahoma City, both of Okla., assignors to The Board of Regents of the University of Oklahoma, Norman, Okla.

Division of Ser. No. 187,670, Jan. 27, 1994. This application Dec. 8, 1994, Ser. No. 352,336

Int. Cl.[6] A61K *9/14;9/10;47/42*

U.S. Cl. 424—499 **19 Claims**

1. A process for producing a pharmaceutical particulate support matrix, comprising:

providing an aqueous composition comprising:

an aqueous medium,

a support agent comprising a first gelatin component capable of maintaining a net charge, a second gelatin component capable of maintaining a net charge of the same sign as the first gelatin component, and a bulking agent, and wherein the first gelatin component and the second gelatin component together comprise about 2% to 20% by weight of the particulate support matrix and wherein the bulking agent comprises about 60% to 96% by weight of the particulate support matrix, and wherein the second gelatin component has a solubility in aqueous solution greater than that of the first gelatin component and wherein the mass:mass ratio of the first gelatin component to the second gelatin component is from about 1:½ to about 1:14, and

a volatilizing agent comprising an alcohol for enhancing the rate of vaporization of the aqueous medium; and

introducing the aqueous composition as droplets into a drying chamber heated to a predetermined temperature causing evaporation of the aqueous medium and volatilizing agent from the droplets leaving the support agent in a dried and expanded particulate form comprising the particulate support matrix.

5,587,181

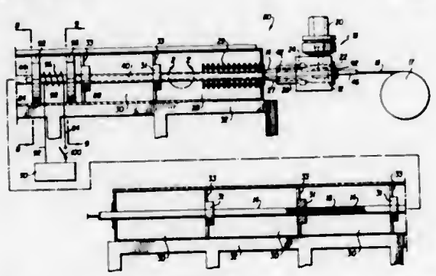
MAGNETIC SUPPORT SYSTEM FOR CABLE INSERTION TUBE

Steve C. Owens, Coweta County; Richard V. Lovvorn, Carroll County, and Albert B. Elder, Haralson County, all of Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 232,883, Apr. 25, 1994, Pat. No. 5,439,363. This application Dec. 30, 1994, Ser. No. 366,703

Int. Cl.[6] B29C *47/90*

U.S. Cl. 425—3 **14 Claims**



9. Apparatus for positioning a cable in a bore of an extruded polymeric conduit, comprising:

means for extruding the conduit;

a ferromagnetic cable insertion tube cantilevered from said extruding means and adapted to extend upstream of said extruding means and downstream of said extruding means through said bore of the extruded conduit, said cable insertion tube having a first free end at the downstream end thereof and a second free end at the upstream end thereof;

an electrical winding having an upstream end and a downstream end surrounding a portion of said cable insertion tube downstream of said extruding means;

a d.c. power source connected to said winding for generating a magnetic flux in said cable insertion tube downstream of said extruding means to form a first magnetic pole having a first polarity at said downstream free end and a second magnetic pole having a second polarity opposite to the first polarity upstream of said downstream free end; and

a first magnet means having a first magnetic pole with a polarity the same as the first polarity and supported in confronting relationship with said downstream free end of said cable insertion tube, and a second magnet means having a second magnetic pole with a polarity the same as the second polarity and supported in confronting relationship with said cable insertion tube intermediate of said downstream free end and said extruding means in such position for magnetically levitating said tube and preventing the free end thereof from sagging into contact with the polymeric conduit.

5,587,182

APPARATUS FOR THE PRODUCTION OF ENDLESS POLYURETHANE MOLDINGS

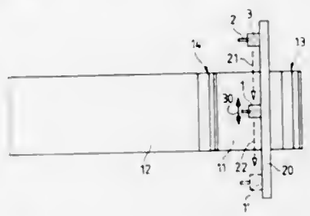
Hans-Michael Sulzbach, Königswinter, and Lothar Röhrig, Neunkirchen-Seelscheid, both of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Feb. 15, 1995, Ser. No. 388,790

Claims priority, application Germany, Feb. 21, 1994, 44 05 427.0

Int. Cl.[6] B29C *44/20;* **B01F** *15/00*

U.S. Cl. 425—4 C **1 Claim**



1. An apparatus for the production of endless polyurethane moldings from at least two reaction components comprising:

A) storage containers for each reaction component,

B) a continuously moving mold,

C) at least two alternately operated mixheads, each of said mixheads comprising:

1) an inlet opening,

2) a mixing chamber in which said reaction components are mixed,

3) a first outlet through which a mixture of said reaction components passes from said mixing chamber,

4) a second outlet through which a reaction component passes,

5) a changeover valve which allows reaction component to either

i) enter said inlet opening, enter said mixing chamber and pass through said first outlet, or

ii) enter said inlet opening and pass through said second outlet,

E) a first feed line leading from a storage container to a metering pump,

F) a second feed line leading from a storage container to a conditioning pump,

G) feed lines leading from said metering pump to each of the inlet openings of each of said mixheads,

H) feed lines leading from said conditioning pump to each of the inlet openings of each of said mixheads,

I) feed lines leading from each of said second outlets to a storage container.

5,587,183

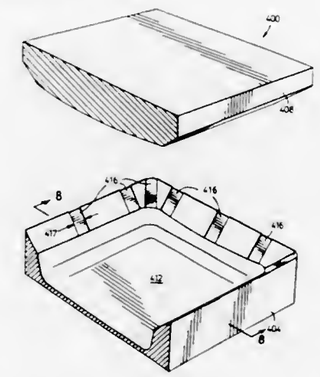
MOLD HAVING VENT PASSAGEWAYS TO OBIVATE TRIMMING OF FLASH

Leslie E. Clark, Maple; Craig A. Hunter, Milton; Robert B. Magee, Caledon East; Gerry Vande Wetering, Georgetown, and Wilfred W. T. Cheng, Oakville, all of Canada, assignors to Woodbridge Foam Corporation, Mississauga, Canada

Division of Ser. No. 220,927, Mar. 31, 1994, Pat. No. 5,482,721, which is a division of Ser. No. 939,704, Sep. 2, 1992, Pat. No. 5,356,580. This application Jun. 7, 1995, Ser. No. 475,048

Int. Cl.[6] B29C *33/10;33/40;44/58*

U.S. Cl. 425—4 R **23 Claims**



1. A mold for producing foamed articles having a plurality of ribbon-shaped appendages, the mold comprising:

an upper mold and a lower mold which define a substantially rectangular-shaped mold cavity; and

a first plurality of vents in communication with the mold cavity, and disposed on one side of said substantially rectangular-shaped mold cavity, and a second plurality of vents in communication with the mold cavity and disposed on a second side of said mold cavity which is adjacent said one side, said first and second pluralities of vents being disposed on a part line between said upper mold and said lower mold, each vent having a vent passageway with an entrance and an exit, each said vent passageway being elongated with a width parallel to the part line substantially greater than a thickness orthogonal to the part line to cause liquid foam polymeric composition expanding inside the mold cavity to enter into each said vent passageway entrance but to not exit from each said vent passageway exit to cause at least partial curing of the liquid foam polymeric composition within each said vent passageway, each vent passageway being of a size and elongated shape so that the at least partially cured liquid foam polymeric composition in said vent passageway does not separate from the molded foam article when the upper and lower mold are separated to produce the plurality of ribbon-shaped appendages on the foamed article.

5,587,184

COATING DIE WITH SLOT THICKNESS CONTROL

William K. Leonard, River Falls, Wis.; Stephen W. Mohn, St. Paul, Minn.; Timothy J. Edman, Stillwater, Minn., and Phillip D. Schiller, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

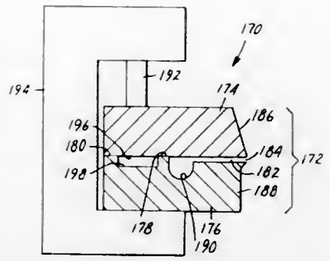
Division of Ser. No. 177,152, Jan. 4, 1994, Pat. No. 5,464,577. This application Jun. 2, 1995, Ser. No. 459,311

Int. Cl.[6] B29C *47/04;47/16*

U.S. Cl. 425—133.5 **7 Claims**

1. A die comprising:

a first plate having a lip;



a second plate having a lip and contacting the first plate at first and second locations, wherein the second location is further from the lips than the first location, to form a first slot through the die which terminates and is bounded at its exit by the first and second lips;

means for holding, the first and second plates together; and

first means for deforming at least one of the first and second plates at or between the first and second locations thereby to change the gap at the exit of the first slot, wherein one plate has a first cutout formed at one of the first and second locations and wherein the first deforming means is located in the first cutout.

5,587,185

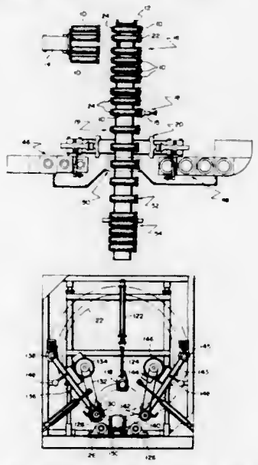
AUTOMATED SYSTEM FOR HANDLING AND CLEANING CONCRETE PIPE-MAKING COMPONENTS

Hartzell H. Schmidgall, and Jon A. Schmidgall, both of Mediapolis, Iowa, assignors to Hawkeye Concrete Products Co., Mediapolis, Iowa

Filed Apr. 18, 1994, Ser. No. 229,191

Int. Cl.[6] A46B *13/02*

U.S. Cl. 425—229 **6 Claims**



1. A system for cleaning concrete deposits from the surfaces of annular shaped headers and pallet rings used in the manufacture of concrete pipe, said system comprising: a cleaning table having a receiving area into which the ring to be cleaned is moved; a cleaning station extending over a portion of the cleaning table; a pair of spaced-apart drive rollers at one side of the table within the cleaning station; a first slot in the cleaning table extending from the receiving area through the cleaning station; a first ring moving member moveable along the first slot and controllably extendable up through the first slot and above the table and retractable beneath the table; first means causing the ring moving member to extend up

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through the table at the ring receiving area so as to extend inside a ring resting on the table at the receiving area; second means to move the ring moving member along the first slot and advance a ring from the receiving area into the cleaning station adjacent to the drive rollers within the station; third means to retract the ring moving member when the ring is adjacent the drive rollers; fourth means to move the ring and hold it against the drive rollers to allow the drive rollers to rotate the ring; cleaning means moveable into and out of a position to engage the surfaces of the ring to be cleaned while the ring is rotating; a second slot in the cleaning table extending from the cleaning station to an area outside the cleaning station; and a second ring moving member moveable along the second slot and controllably extendable up through the slot and retractable beneath the table to selectively engage a cleaned ring and move it outside the cleaning station.

5,587,186

APPARATUS FOR PELLETIZING PLASTICS

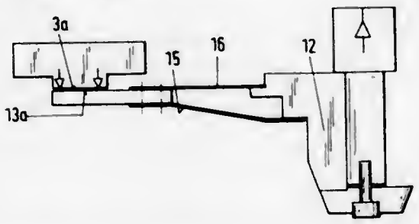
Jürgen Voigt, Wathlingen, Germany, assignor to Herman Berstorff Maschinenbau GmbH, Hanover, Germany

Filed Sep. 8, 1994, Ser. No. 302,512

Claims priority, application Germany, Sep. 11, 1993, 43 30 834.1

Int. Cl.[6] B29B *9/06*

U.S. Cl. 425—310 **6 Claims**



1. Apparatus for pelletizing plastic material discharged through a die plate, comprising:

a stationary housing defining a melt channel,

a die plate secured to said housing and formed with die openings through which melt strands are discharged, said die plate having a bottom surface,

a knife head mounted for rotation in said housing,

a plurality of cutting knives having cutting edges extending radially substantially along and passing closely adjacent to the said bottom surface of said die plate for cutting said strands into pellets, and

a coupler mechanism mounted on said knife head and extending radially therefrom, said coupler mechanism comprising a pair of cranks which are coaxially arranged one above the other and which support therebetween said cutting knives, said coupler mechanism being constructed and arranged to maintain the cutting knives parallel to said bottom surface of said die plate over the entire length of contact of said cutting knives with said bottom surface regardless of the pressure exerted by said knives on said bottom surface.

5,587,187

BRICK PRESS

Marthinus J. Benade, Plot 4, Glen Dayson, Roodepoort, South Africa

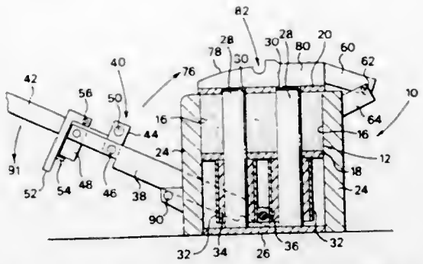
Filed Feb. 1, 1995, Ser. No. 384,267

Claims priority, application South Africa, Feb. 2, 1994, 94/0706

Int. Cl.[6] B28B *3/04;* **B30B** *1/04;1/26*

U.S. Cl. 425—409 **9 Claims**

1. A brick press comprising:



a brick pressing chamber which can be charged with loose material that is to be pressed to form a brick and which is defined by side walls, a bottom wall and a top wall, the bottom wall being provided by a platen which is movable towards and away from the top wall, and the top wall being provided by a lid which is movable between a closed position in which said lid closes the chamber and an open position in which it opens the chamber, and

a lever mechanism operable, with the lid in said closed position, firstly with a cam action to move the platen towards the lid so as to apply initial compression to loose material in the pressing chamber and secondly with a levering action to move the platen further towards the lid to apply final compression to the initially compressed material in the pressing chamber,

wherein the lever mechanism includes a lever attached pivotally relative to the platen, a cam follower on the lever and a cam surface on the lid, the lever being pivotable relative to the platen in a first direction to cause movement of the cam follower over the cam surface with the result that the platen is moved towards the lid to apply initial compression to the material the pressing chamber.

5,587,188

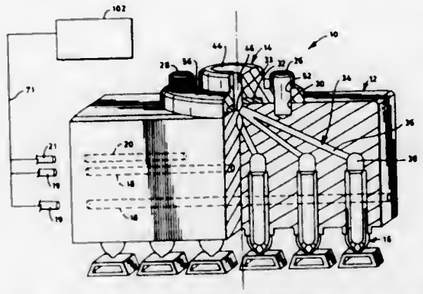
MULTITIP HOT RUNNER SYSTEM

Douglas C. Hepler, Rochester, N.Y., assignor to Polyshot Corporation, Henrietta, N.Y.

Continuation-in-part of Ser. No. 249,089, May 25, 1994, Pat. No. 5,464,343, which is a continuation of Ser. No. 982,473, Nov. 27, 1992, abandoned. This application Sep. 9, 1994, Ser. No. 303,495

Int. Cl.[6] B29C *45/22*

U.S. Cl. 425—549 **9 Claims**



1. A multitip hot runner apparatus for transporting molten plastic from an injection machine to a plurality of mold cavities while controlling the temperature of the molten plastic, said apparatus comprising:

a generally rectangular, parallelopiped shaped distribution body fabricated of a single piece of metal, having a predetermined depth, and being bilaterally symmetric about a centerline, said distribution body having top, bottom, and side surfaces, a distribution well formed in said top surface for receiving molten plastic, a plurality of unrestricted and substantially identically configured through flow channels formed between said distribution well and said bottom surface of said distribution body to transport molten plastic in a general direction of flow from said distribution well along said flow channels and toward said bottom surface, each of said through flow channels having lower sections adapted to releasably receive tips for transporting molten plastic beyond said bottom surface to gates of respective mold cavities and being aligned aside of one another generally in a line with a predetermined spacing between them, a plurality of heater holes equally spaced within said distribution body with respect to said flow channels so that each flow channel is surrounded in said distribution body by a substantially identical thermal mass to assure uniform heating of said flow channels when heaters present in said distribution body are energized, said heater holes extending parallel to said top and bottom surfaces of said distribution body, transverse to said general direction of flow, and a single non-through thermocouple hole, extending from one side of said distribution body, horizontally and parallel to said heater holes to a predetermined length short of said distribution body centerline; said thermocouple hole being arranged to facilitate monitoring of the temperature at a location in one of said distribution body's bilaterally symmetric halves;

each of said plurality of heaters being disposed in a corresponding one of said plurality of heater holes;

a thermocouple disposed in said thermocouple hole for monitoring the temperature of said distribution body and supplying temperature feedback information for controlling the temperature of all of said flow channels; and

a plurality of tips, each of said tips being releasably engaged within a respective one of said lower sections of said flow channels to form an air space to prevent heat loss, said tips being fabricated of a material with high heat conducting properties relative to those of said distribution body to conduct heat from said distribution body outside of said bottom surface thereof to prevent plastic freeze at cavity gates; and

a interface body attached to said distribution body for receiving molten plastic and transporting it to said distribution well of said distribution body.

5,587,189

MOLDING DEVICE FOR REGISTER OF SYNTHETIC RESIN

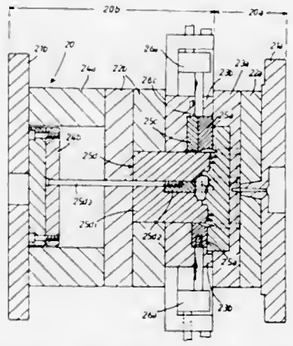
Hideki Nilmi, Nisio, Japan, assignor to Wako Plastics Industries Co., Ltd., Aichi-ken, Japan

Filed Oct. 18, 1995, Ser. No. 544,819

Claims priority, application Japan, Oct. 19, 1994, 6-253681

Int. Cl.[6] B29C *45/33;45/36;45/44*

U.S. Cl. 425—577 **3 Claims**



1. A molding device for a register of synthetic resin adapted for use in adjustment of air flow, the register being comprised of an outer frame assembly, a plurality of spaced adjustment blades assembled within the outer frame assembly to be pivotally moved and a link member pivotally engaged with each rear shoulder of the adjustment blades for interconnection of the adjustment blades, the outer frame assembly being comprised of a pair of outer frame members each having a frame body integral with a pair of opposed side wall portions and being integrally coupled with each other at their side wall portions to form the outer frame assembly,

wherein the molding device comprises a pair of opposed first slide cores each formed with a molding surface forming each frame body of the outer frame members, a pair of opposed second slide cores arranged perpendicularly to said first slide cores, said second slide cores each being formed with a molding surface forming each side wall portion of the outer frame members, a third slide core positioned adjacent one of said first slide cores, said third slide core being formed with a molding surface forming the link member, and a core block arranged to be disposed between said first and second slide cores, said core block being formed with a molding surface forming the adjustment blades, and wherein said molding device further comprises first actuator means for moving said first slide cores toward and away from said core block so that in a condition where said first slide cores have been moved toward said core block, the outer frame members are coupled with each other at their side wall portions and engaged with the adjustment blades carried by said core block; guide means for moving said second slide cores outwardly when said core block has been retracted; and second actuator means for moving said third slide core toward said core block so that the link member is engaged with the adjustment blades carried by said core block.

5,587,190

DIETARY DRINK INTENDED TO ENABLE SUSTAINED ACTIVITY

Yannick Guezennec, Fontainebleau; Joseph Koziet, Villiers Sur Marne, and Michel Thiry, Vigneux Sur Seine, all of France, assignors to Pernod Ricard, Paris, France

Continuation of Ser. No. 78,957, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 776,634, Oct. 15, 1991, abandoned. This application Mar. 21, 1995, Ser. No. 408,110

Int. Cl.[6] A23L *2/00*

U.S. Cl. 426—2 **3 Claims**

1. A method of enabling sustained activity comprising supplying to a mammal a composition comprising carbohydrates and lipids, said lipids constituting 10 to 55% of the calorie content of the composition and consisting of medium chain triglycerides and long chain triglycerides, said carbohydrates constituting 30% to 90% of the calorie con the concentration ratio of carbohydrates to lipids is greater than or equal to 1 and wherein at least a portion of said carbohydrates comprise fructose, said composition being supplied in liquid form before, during or after said sustained activity.

5,587,191

PROCESS FOR MAKING HIGHLY OXYGENATED DRINKING WATER AND DRINKING WATER MADE BY THE PROCESS

Kurt W. Donsbach, 880 Canarios Ct., #210, and Ricardo Cazares, 870 Canarios Ct., #3, both of Chula Vista, Calif. 91910, assignors to Chang S. Kim, Honolulu, Hi.; Kurt W. Donsbach, and Ricardo Cazares, both of Chula Vista, Calif.

Filed Jul. 26, 1995, Ser. No. 507,584

Int. Cl.[6] A23L *2/00*

U.S. Cl. 426—66 **17 Claims**

16. A method of making highly oxygenated drinking water, comprising:

initially preparing a stabilized hydrogen peroxide solution composed of about 0.075% by weight of hydrogen peroxide added as a 30% by weight aqueous solution, about 15% by weight of a water soluble polyvinylpyrrolidone having a K value of about K15, about 50% by weight of a water soluble polyvi-

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nylpyrrolidone having a K value of about K30, and about 5% by weight of a water soluble polyvinylpyrrolidone having a K value of about K90; and

adding a quantity of said stabilized hydrogen peroxide solution to a quantity of drinking water to highly oxygenate the drinking water for consumption purposes.

5,587,192

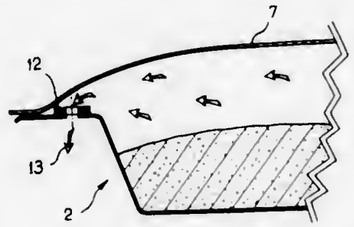
VENTABLE CONTAINER

Michel Beizermann, Voiron, France, assignor to Societe de Constructions de Material Metallique, Renage, France

Filed Sep. 29, 1994, Ser. No. 314,858

Int. Cl.[6] B65D *81/34*

U.S. Cl. 426—118 **5 Claims**



1. A container comprising a lower body including a tray having a recessed portion terminating at an upper lip that surrounds the tray, said recessed portion containing a product to be heat processed in the container, the lip having a flat configuration including an upper surface and an inner edge separating the tray from the upper surface of the lip, an upper film secured to the lower body by a first bond comprising a weld extending along a welding line on the upper surface of the lip so that the upper film hermetically seals the product in said lower body, a hole formed in the lip between the welding line and the inner edge of the lip, the hole being defined and surrounded by a portion of the upper surface of the lip and being closed by the film extending across the hole in sealing relationship, the film being flexible away from the tray in response to increased gas pressure within the container during heating of the product and a layer of hot melt adhesive having a melting point between 65° C. and 150° C. placed in spaced relation from said welding line and in interposition between the upper film and the portion of the upper surface of the lip that surrounds the hole, said layer releasably bonding said upper surface of the lip to the film to form a second bond between said upper surface of said lip and said film such that said film seals the hole and prevents gaseous communication between the hole and the recessed portion of the tray under temperature conditions less than said melting point and such that when said container and product are heat processed and said film flexes away from said tray, said hot melt adhesive layer softens and releases said second bond between said upper surface of the lip and said film to expose said hole to gaseous communication between the hole and the recessed portion of the tray, thus enabling venting of the container, and such that said second bond between said upper surface of the lip and said film reforms upon the container cooling such that the hole is again sealed, preventing gaseous communication between the hole and the recessed portion of the container.

5,587,193

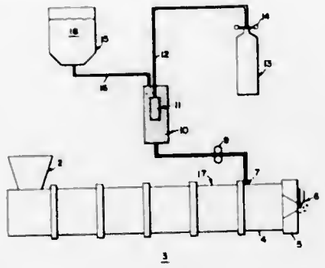
PROCESS FOR MANUFACTURING FAT-ENRICHED FOODS

Massoud Kazemzadeh, Bloomington, Minn., assignor to MJM Technologies, Stacy, Minn.

Filed Sep. 12, 1995, Ser. No. 527,005

Int. Cl.[6] A23K *1/00*

U.S. Cl. 426—448 **7 Claims**



1. A method of manufacturing a fat-enriched low bulk density animal food extrudate comprising the steps of:

adding a gas into an oil medium to form a gas saturated oil medium wherein the gas in the oil medium is in the form of microbubbles;

injecting the gas saturated oil medium into an extruder;

mixing the gas saturated oil medium with an animal food extrudate within the extruder;

exiting of the resulting mixed extrudate through a die, and

expanding said mixed extrudate through release of pressure.

5,587,194

APPARATUS AND METHOD FOR STERILIZING FOOD

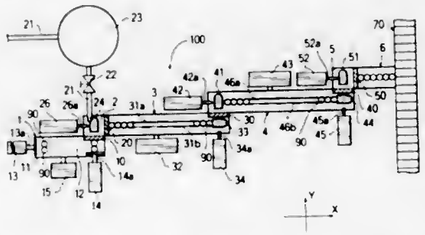
Masayuki Nakatani, Nagoya; Koji Sengoku, Chiba-ken, and Akifumi Fujita, Ichihara, all of Japan, assignors to House Foods Corporation, Osaka, Japan

Filed Jun. 15, 1995, Ser. No. 490,708

Claims priority, application Japan, Jun. 16, 1994, 6-134655

Int. Cl.[6] A23L *3/00*

U.S. Cl. 426—521 **6 Claims**



2. A food sterilizing method comprising the steps of:

feeding food into a sterilizing apparatus, said sterilizing apparatus including a heating and sterilizing chamber for heating and sterilizing food and a cooling chamber connected to the heating and sterilizing chamber via a sealing gate, the heating and sterilizing chamber and the cooling chamber each having an inner pressure;

maintaining the inner pressure of the cooling chamber at a level higher than the inner pressure of the heating and sterilizing chamber by 0.05–0.3 Kg/cm^2; and

passing food through the sterilizing apparatus to sterilize and cool the food.

5,587,195

PLASTIC FAT SPREAD COMPRISING A HARDSTOCK

Cornelis L. Sassen, Schiedam, Netherlands, assignor to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed May 8, 1995, Ser. No. 437,191

Claims priority, application European Pat. Off., May 10, 1994, 94201322

Int. Cl.[6] A23D *7/00*

U.S. Cl. 426—607 **6 Claims**

1. A spread comprising: 5 to 90% fat phase and 95–10% of an aqueous phase, the fat phase comprising 4–20% of a fully hardened but otherwise not chemically treated fat material used as a hardstock having the following fatty acid composition:

C_{12}	9–45 wt %
C_{14}	1–5%
C_{16}	3–7%
C_{18}	>40%

others up to 10%, these fatty acids being arranged in the following triglyceride combinations:

H3	0–35 wt %
HHM	20–80%
MHM	10–60%
M_3	0–10%

H representing saturated acids having more than 15 carbon atoms and M saturated acids having 12 or 14 carbon atoms, the sequence of the symbols H and M representing the position of the fatty acids in the triglyceride molecule,

and a liquid oil as the remaining portion of the fat phase.

5,587,196

METHODS AND COMPOSITIONS TO ADD FLAVOR TO FOOD PRODUCTS CONTAINING LIPID

David W. Mehnert, Antioch; Kevin Forneck, Morton Grove; Steven Prince, and Michael D. Major, both of Evanston, all of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Feb. 15, 1995, Ser. No. 388,013

Int. Cl.[6] A23D *9/007*

U.S. Cl. 426—611 **39 Claims**

1. A flavored fat substitute comprising a fat substitute and a flavor; the flavored fat subs which is prepared by volatile transfer of the flavor into the fat substitute;

wherein the fat substitute me is a non-digestible fat and the flavored fat substitute is essentially free of diestibe fat.

5,587,197

PROCESS FOR PRODUCTION OF WATER-SOLUBLE VEGETABLE FIBER

Hirokazu Maeda; Hitoshi Furuta, both of Kitasoma-gun; Chiemi Takei, Inashiki-gun; Toshiaki Saito, Sennan-gun; Hiroyuki Mori, Abiko, and Kazunobu Tsumura, Kitasoma-gun, all of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 76,946, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 768,412, Oct. 7, 1991, abandoned. This application May 10, 1995, Ser. No. 437,983

Claims priority, application Japan, Feb. 7, 1990, 2-27882; Feb. 9, 1990, 2-30677

Int. Cl.[6] A23G *3/00*

U.S. Cl. 426—658 **3 Claims**

1. A process for the production of water-soluble vegetable fibers which comprises degrading okara, said okara being a water-insoluble residue containing insoluble protein and insoluble fiber and obtained by adding water to defatted soybeans to form a slurry and removing the water soluble fraction from the slurry, said degrading being carried out at a pH 3 to 6 and at a temperature of 80° to 130° C. to obtain water-soluble hemicellulose having an average molecular weight of 50,000 to 1,000,000 and a protein content of less than 10% by weight based on the dry solids and recovering the water soluble hemicellulose.

5,587,198

POSITIVE HYDRATION METHOD OF PREPARING CONFECTIONERY AND PRODUCT THEREFROM

Subraman R. Cherukuri, Towaco, N.J.; Robert K. Yang, Flushing, N.Y.; Cecil A. Bowles, Sioux City, Iowa; Jose F. Zamudio-Tena, Vienna, and Santi R. Bhowmik, Chesapeake, both of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Filed May 31, 1995, Ser. No. 455,936

Int. Cl.[6] A23G *3/00*

U.S. Cl. 426—660 **39 Claims**

1. A method of making a confectionery mass comprising:

forming a confectionery mass by combining a saccharide-based shearform matrix and a hydrated hydrobinding agent selected from the group consisting of food grade gums, gelatin and mixtures thereof said hydrated hydrobinding agent present in an amount sufficient to hydrate said shearform matrix so as to provide internal cohesiveness and lubricity to said confectionery mass without causing syneresis.

5,587,199

PROCESS OF PREPARING PARTICLES FOR NMR IMAGING

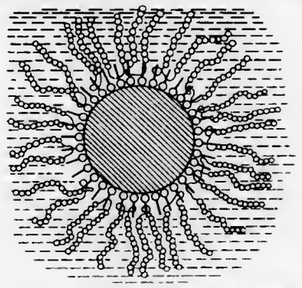
Hervé Tournier, Valleiry; Roland Hyacinthe, Douvaine, both of France, and Michel Schneider, Troinex, Switzerland, assignors to Bracco International B.V., Switzerland

Division of Ser. No. 96,414, Jul. 26, 1993, Pat. No. 5,464,696. This application Apr. 13, 1995, Ser. No. 421,329

Claims priority, application European Pat. Off., Aug. 13, 1992, 92810618; May 25, 1993, 93810380

Int. Cl.[6] B05D *7/00;3/12;* **B32B** *9/00;* **B06B** *1/00*

U.S. Cl. 427—2.12 **8 Claims**



1. A method of making a particle for use in the NMR blood-pool imaging of human or animal patients, said particle comprising a magnetite iron oxide core and a layer of at least one amphipatic compound having a negatively charged phosphorus containing head moiety bonded to a hydrophobic tail moiety and one or more surfactants, said method comprising the steps of:

(a) selecting said amphipatic compound from an alkyl, alkenyl or cycloalkyl mono ester of phosphoric acid or a phospholipid in a micellar form;

(b) selecting at least one of said surfactants from physiologically acceptable non-ionic surfactants;

(c) suspending in an aqueous phase: (i) magnetite iron oxide particles, (ii) at least one of the selected amphipatic compounds and (iii) at least one of the selected non-ionic surfactants to form a mixture; and

(d) energizing the mixture by sonicating, microfluidizing or heating to organize the molecules of the amphipatic compound relative to the iron oxide core so that the phosphorus containing head moiety of the amphipatic compound is pointing towards the iron oxide core and the hydrophobic tail

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moiety protrudes therefrom, the negatively charged head moiety having the negative charges of two oxygen atoms available for interaction with the core and the hydrophobic tail moiety having at least eight carbon atoms, thereby producing three dimensional structures around said iron oxide particles.

5,587,200

METHOD FOR MANUFACTURING A MEDICAL ELECTRODE

Hans P. Lorenz, Schwarzenbruk; Bernd Straehler, Berlin, both of Germany, and Ulf Lindegren, Enskede, Sweden, assignors to Pacesetter AB, Solna, Sweden

Filed Nov. 7, 1995, Ser. No. 554,770

Claims priority, application Germany, Nov. 11, 1994, 44 40 386.0

Int. Cl.[6] B05D *1/32;* **C23C** *8/04;8/24;16/34*

U.S. Cl. 427—2.24 **14 Claims**

1. A method for manufacturing a medical electrode comprising the steps of:

disposing a bare substrate of electrically conductive material in an atmosphere containing titanium, nitrogen and hydrogen;

directly covering said bare substrate with an optical mask having a pattern therein having openings corresponding to a structure to be produced on said substrate; and

irradiating said substrate with said optical mask thereon in said atmosphere with an excimer laser and thereby depositing a structure of porous titanium nitride corresponding to said pattern directly on said substrate exclusively in said openings.

5,587,201

FILMING COMPOSITION FOR CATHODE RAY TUBE AND METHOD OF MANUFACTURING SCREEN USING THE SAME

Hwan-chul Rho; Hong-gyu Choi, and Jae-myung Kim, all of Hwaseong-gun, Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 30, 1995, Ser. No. 413,888

Claims priority, application Rep. of Korea, Dec. 7, 1994, 94-33112

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—64 **5 Claims**

1. A method for manufacturing a screen having high luminance comprising the steps of:

forming a phosphor layer on a black matrix adhered to a panel;

forming a filming layer by coating and drying a filming composition containing a decomposable organic polymer and a reducing agent on said phosphor layer;

forming a metal layer on said filming layer; and

heating said phosphor layer, filming layer and metal layer to a temperature sufficient to decompose said filming layer.

5,587,202

REPULPABLE HOT MELT POLYMER/FATTY ACID COMPOSITIONS FOR FIBROUS PRODUCTS

Paul E. Sandvick, and Calvin J. Verbrugge, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 96,523, Jul. 22, 1993, Pat. No. 5,419,190. This application Dec. 14, 1995, Ser. No. 572,404

Int. Cl.[6] D21H *19/00*

U.S. Cl. 427—155 **18 Claims**

1. A method of rendering a paper article water-resistant that comprises the steps of

heating a hot melt polymer/fatty acid composition that is dispersible in a nearly neutral to alkaline aqueous pH medium heated to above about 50 degrees C. consisting essentially of

A. from about 5% to 50% by weight based upon the total weight of the composition of at least one addition polymer selected from the group consisting of

(i) a polymer of from about 5 to 95 mole percent of at least one ethylenically unsaturated monocarboxylic acid monomer containing a free carboxyl group and from about 5 to 95 mole percent of at least one additional ethylenically unsaturated monomer,

(ii) a polymer of from about 50 to 95 mole percent of at least one ethylenically-unsaturated dicarboxylic acid monomer selected from the group consisting of an ethylene-1,2-dicarboxylic acid containing two free carboxyl groups and an ethylene-1,2-dicarboxylic acid anhydride having two carboxyl groups in the form of an anhydride group, and from about 5 to 50 mole percent of at least one additional ethylenically unsaturated monomer, and

(iii) a polymer of a total of from about 5 to 95 mole percent of (a) at least one of the ethylenically unsaturated monocarboxylic acid monomers and (b) at least one of the ethylenically-unsaturated dicarboxylic monomers and from about 5 to 95 mole percent of at least one additional ethylenically unsaturated monomer, wherein the additional ethylenically unsaturated monomer is selected from the group consisting of 1-alkenes having from about 4 to 60 carbon atoms; alkyl vinyl ethers having an ether alkyl group of from about 8 to 60 carbon atoms, and alkyl acrylates or alkyl methacrylates having an alkyl group of from about 8 to 60 carbon atoms, and

B. from about 50% to 95% by weight based upon the total weight of the composition of at least one fatty acid selected from the group consisting of natural or synthetic fatty acids containing from about 12 to 48 carbon atoms, wherein the fatty acid is compatible with the polymer and wherein the composition is a solid at 20° C., but starts to become fluid between about 50° C. and 95° C., until it becomes fluid,

applying to a paper article an amount of the fluid heated composition that is effective to render it water-resistant, and

allowing the composition to cool to room temperature to form a coated paper article having a solid coating that is removable upon exposure of the coated paper article to a nearly neutral to alkaline pH medium heated to above about 50 degrees C.

5,587,203

METHOD FOR PREPARING A CARBON/CARBON COMPOSITE MATERIAL

Yoshio Soda; Takefumi Kohno; Masaaki Shinagawa, and Noriyuki Kiuchi, all of Yokohama, Japan, assignors to Nippon Oil Co., Tokyo, Japan

Continuation-in-part of Ser. No. 342,858, Nov. 21, 1994, abandoned. This application Aug. 29, 1995, Ser. No. 520,654

Claims priority, application Japan, Nov. 29, 1993, 5-320817

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—228 **8 Claims**

1. A method of preparing a carbon/carbon composite material which consists of the steps of

1) impregnating a carbon preform with a carbonaceous pitch, said carbonaceous pitch having a carbon/hydrogen atomic ratio of less than 1.60 and exhibiting a densification parameter of 0.1 or more, said densification parameter being calculated by heating said carbonaceous pitch in an open-type crucible from room temperature up to 1000° C. at a rate of 2° C./min. and then keeping at 1000° C. for two hours whereby said carbonaceous pitch is sintered, said densification parameter being calculated by the formula

$$\text{densification parameter} = K \times L$$

wherein

$$K = \frac{(C-A)}{B-A}$$

and

$$L = \frac{(C-A)}{V \times T}$$

wherein

C= weight of the crucible and the sintered product

A= weight of the crucible

B= weight of the crucible and pitch before sintering

V= volume of the sintered product

T= true density of the sintered product

and then

2) heating said impregnated preform at a temperature of 250°–3000° C. and subjecting to an isotactic compression at a pressure higher than atmospheric pressure up to 10 Kgf/cm^2 whereby said impregnated preform is carbonized and a carbon/carbon composite is obtained.

5,587,204

RECYCLABLE PAPERBOARD COMPOSITES

Joe L. Kinsey, Jr., Irvington, and Robert L. Lanham, Jr., Mobile, both of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed Mar. 22, 1995, Ser. No. 408,479

Int. Cl.[6] B05D *1/38*

U.S. Cl. 427—411 **8 Claims**

1. A method for making recyclable coated paperboard composites comprising providing a cellulosic paperboard substrate having two surfaces, applying adjacent at least one surface of the substrate a highly alcoholized polyvinyl alcohol binder layer and applying a polyethylene coating layer to the polyvinyl alcohol binder layer, wherein the polyvinyl alcohol coating layer is applied in an amount of ranging from about 2 to about 12 pounds per 3000 square feet of substrate.

5,587,205

PLASMA PROCESSING METHOD AND AN APPARATUS FOR CARRYING OUT THE SAME

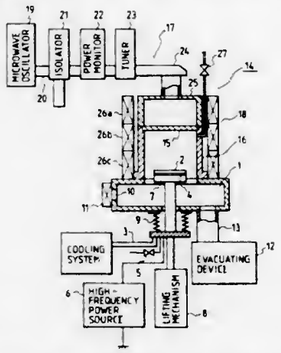
Hiroshi Saito, Fujisawa; Yasumichi Suzuki, Yokohama, and Naoyuki Tamura, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1993, Ser. No. 172,285

Claims priority, application Japan, Dec. 28, 1992, 4-347682; Dec. 28, 1992, 4-347683; Dec. 10, 1993, 5-310100

Int. Cl.[6] B05D *3/06;* **C23C** *16/00;* **H01L** *21/00*

U.S. Cl. 427—553 **26 Claims**



1. A plasma processing method for processing a thin film formed on a substrate or forming a thin film on a substrate within a vacuum vessel, said plasma processing method comprising the steps of:

supplying a gas into the vacuum vessel;

producing a plasma in the vacuum vessel by applying a microwave at a frequency higher than 2.45 GHz to the gas; and

creating a static magnetic field represented by magnetic lines of force parallel to the direction of propagation of the microwave in the vacuum vessel using a magnetic circuit, the field intensity of the static magnetic field being lower than a field intensity at which electron cyclotron resonance occurs in combination with the frequency of the microwave.

5,587,206

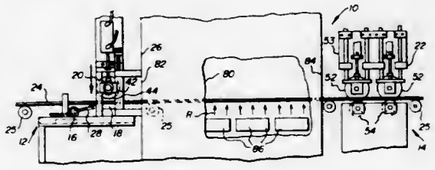
METHOD AND APPARATUS FOR COATING CORRUGATED SHEET MATERIAL

William C. Paul, Mt. Vernon, and Ronald F. Sieloff, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 210,518, Mar. 17, 1994, Pat. No. 5,460,120. This application Oct. 6, 1995, Ser. No. 540,622

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—558 **15 Claims**



1. A method for depositing a curable liquid condensate coating of a selected thickness free of visible optical defects onto at least one coatable surface of a transparent sheet comprising the steps of:

movably carrying the sheet in a direction from an inlet to an outlet with the at least one coatable side of the sheet;

engaging the coatable side of the sheet into contact with a saturable resilient applicator means, said applicator means including a support surface which comprises at least one elongated polymeric block and a compressible saturable layer sleevably disposed on the support surface, disposed transverse to the direction of motion;

directing a flooding stream of curable liquid onto the coatable side upstream of the applicator means;

saturating said saturable applicator means with the flood of curable liquid directed onto;

and carrying and wiping away excess curable liquid from the coatable surface by engagement of the applicator against the sheet for coating the sheet with a layer of a selected thickness without producing visible defects on the sheet.

5,587,207

ARC ASSISTED CVD COATING AND SINTERING METHOD

Vladimir I. Gorokhovsky, 2 Laxton Avenue, Apartment 212, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 338,844, Nov. 14, 1994, Pat. No. 5,478,608. This application Aug. 24, 1995, Ser. No. 518,830

Int. Cl.[6] H05H *1/02*

U.S. Cl. 427—571 **61 Claims**

1. An arc assisted coating apparatus comprising a tube having a reaction zone and at least one inlet for injection of a carrier gas, a plasma-creating gas and a reaction species,

one or more cathodes located upstream of the reaction zone,

one or more anodes located downstream of the reaction zone,

means for controlling temperature in the reaction zone, and

a plurality of substrate holders positioned within the reaction zone for supporting a substrate to be coated, whereby each of the plurality of substrate holders includes a wall which acts as a liner to confine an arc discharge created between a cathode and an anode,

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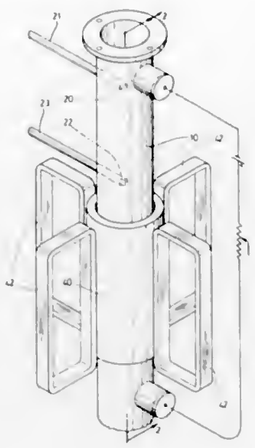


wherein a plurality of axially aligned arcs or a plurality of transversely distributed parallel arcs or both are generated with a main arc burning between one of the one or more cathodes and one of the one or more anodes.

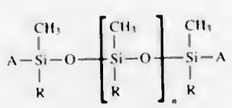
5,587,208

RADIATION INDUCED GRAFTING OF POLYORGANOSILOXANES TO FLUOROELASTOMERS

Santokh S. Badesha, Pittsford; David H. Pan, Rochester; William M. Prest, Jr., Webster; Arnold W. Henry, Pittsford; George J. Heeks, Rochester, and Louis D. Fratangelo, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1993, Ser. No. 155,350
Int. Cl.[6] C08J *7/04*
U.S. Cl. 427—503 **15 Claims**

1. The method of making a low surface energy material comprising providing a shaped fluoroelastomer, preparing a solvent solution of a polyorganosiloxane having reactive functionality and the formula:



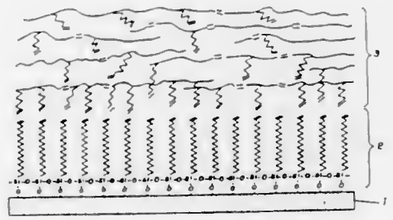
where R is an alkyl, alkenyl or aryl group having less than 19 carbon atoms or an aryl group substituted with an alkyl or alkenyl group having less than 19 carbon atoms, the functional group A is epoxy, vinyl, acrylic, allylic or methacrylic and n is 2 to 350, contacting said fluoroelastomer with said solution to form at least a thin coating of the polyorganosiloxane on said fluoroelastomer, and generating free radicals in the fluoroelastomer and in the polyorganosiloxane by exposing said coated fluoroelastomer to a level of activating radiation wherein the fluoroelastomer and the polyorganoxiloxane couple together to form a thin surface layer of the polyorganosiloxane grafted to said fluoroelastomer, wherein said shaped fluoroelastomer is placed in said solvent solution of said polyorganosiloxane to swell said fluoroelastomer and enable said polyorganosiloxane to penetrate below the surface of said fluoroelastomer so that upon subsequent exposure to said radiation a deep graft of said polyorganosiloxane to said fluoroelastomer below the surface of said fluoroelastomer is formed.

5,587,209

FLUOROCARBON-BASED POLYMER LAMINATION COATING FILM AND METHOD OF MANUFACTURING THE SAME

Mamoru Soga, Osaka; Norihisa Mino, Settsu; Kazufumi Ogawa, Hirakata; Yusuke Mochizuki, Neyagawa, and Tsuneo Shibata, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 278,126, Jul. 21, 1994, abandoned, which is a continuation of Ser. No. 61,284, May 14, 1993, abandoned, which is a division of Ser. No. 786,824, Nov. 1, 1991, Pat. No. 5,238,746. This application May 10, 1995, Ser. No. 438,875
Claims priority, application Japan, Nov. 6, 1990, 2-302021
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—503 **8 Claims**



1. A method of manufacturing a fluorocarbon-based polymer lamination coating film which comprises an inner layer comprising an adsorbed film, and an outer layer comprising a cross-linked fluorine-based polymer film wherein the inner layer is bonded onto a substrate surface with siloxane bonds, and said inner layer is bonded to said outer layer, comprising

contacting a silane-based surface active material, capable of reaction with an active hydrogen, with the substrate surface to form the adsorbed film, and

bonding the fluorine-based polymer by a cross-linking reaction process on the adsorbed film.

5,587,210

GROWING AND RELEASING DIAMONDS

Michael J. Marchywka, Lanham, Md., and Pehr E. Pehrsson, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1994, Ser. No. 266,758
Int. Cl.[6] C23C *14/02;16/26*
U.S. Cl. 427—523 **15 Claims**

1. A process for making diamond which comprises the steps of

(a) ion implanting a diamond substrate having a top surface to form a damaged layer of non-diamond carbon below the top surface of the substrate wherein a diamond cap layer is disposed above the damaged layer;

(b) growing diamond on at least a portion of the top surface of the substrate by chemical vapor deposition to form an assembly which includes a bottom layer of the substrate, the layer of non-diamond carbon interfacing with an upper surface of the bottom layer, a diamond cap layer on a surface of the non-diamond carbon layer opposite the interface of the damaged non-diamond carbon and the bottom layer, a grown diamond interfacing with a surface of the diamond cap layer opposite the interface of the diamond cap and the damaged non-diamond carbon layer; and

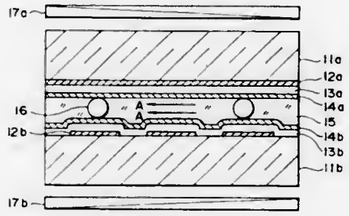
(c) electrochemically etching the assembly in order to remove the damaged layer.

5,587,211

LIQUID CRYSTAL DEVICE AND LIQUID CRYSTAL APPARATUS INCLUDING SAME

Takeshi Togano, Yokohama; Hideaki Takao, Machida; Masanobu Asaoka, Yokohama, and Makoto Kojima, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1995, Ser. No. 423,101
Claims priority, application Japan, Apr. 18, 1994, 6-101717
Int. Cl.[6] G02F *1/1337*
U.S. Cl. 428—1 **10 Claims**



1. A liquid crystal device, comprising: a pair of substrates disposed in parallel with each other and each having an electrode thereon, and a liquid crystal assuming chiral smectic phase disposed between the substrates; at least one of the substrates having thereon an organic alignment film comprising (i) at least one species of polymer having an average molecular weight of at most 30,000 and (ii) at least one species of polymer having an average molecular weight exceeding 30,000.

5,587,212

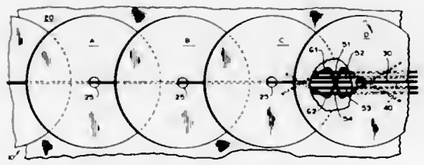
Patent Not Issued For This Number

5,587,213

STRETCH ADORNMENTS

Roberta M. Ruschmann, 260 Minebrook Rd., Bernardsville, N.J.

Filed Nov. 16, 1994, Ser. No. 340,635
Int. Cl.[6] B32B *1/00*
U.S. Cl. 428—12 **11 Claims**



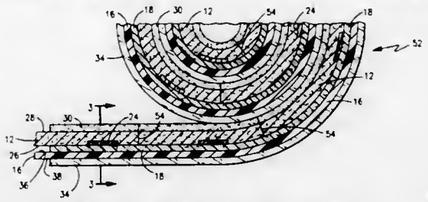
1. An adornment for affixing the same to a surface, said adornment comprising a plurality of ornaments and thread means comprising elastic main thread operatively engaging a plurality of such ornaments for affixing the same to a surface, said thread means allows said ornaments to be stretchably attached to a surface, and bobbin thread, said thread means being the sole means of maintaining said ornaments at a predetermined spaced relationship with respect to each other prior to affixing to a surface.

5,587,214

LAMINATED THERMAL TRANSFER PRINTABLE LABELS

Chauncey T. Mitchell, Jr., Lakeland, Tenn., assignor to Media Solutions, Inc., Lakeland, Tenn.

Filed May 13, 1994, Ser. No. 242,313
Int. Cl.[6] B32B *7/00*
U.S. Cl. 428—40.1 **38 Claims**



1. A roll of thermal transfer label stock comprising:

a first substrate having front and back faces and a length;

said front face of the first substrate adapted for receiving thermal transfer ink;

a linerless adhesive layer on said back face of the first substrate;

a second substrate having front and back faces and a length;

an unimaged layer of thermal transfer ink on said front face of the second substrate;

a release layer on said back face of the second substrate; and

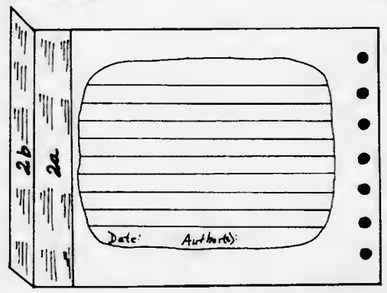
said first and second substrates being aligned along their respective lengths, laminated together, and wound into coils such that said adhesive layer of the first substrate contacts said release layer of the second substrate.

5,587,215

CALENDAR WRITING PAGE

Laurice A. G. Bell, P.O. Box 22122, Tucson, Ariz. 85734-2122

Filed Sep. 14, 1994, Ser. No. 305,582
Int. Cl.[6] B32B *3/04*
U.S. Cl. 428—40.1 **1 Claim**



1. A set of "writing pages" for attachment to the monthly rectangular illustration sheets of a previously existing calendar, comprising:

(a) a plurality of rectangular pages of writing paper each of a size and shape corresponding to that of said illustration sheets;

(b) a corresponding plurality of clear adhesive strips each narrower than said writing paper pages and each having

(i) a first portion aligned with and attached to the front surface of the left edge of one of said writing paper pages, said first portion having a longitudinal side edge that is aligned with and completely covering said left edge of said page and

(ii) a second portion connected along its longitudinal side edge to said first portion side edge and extending beyond such left edge and having adhesive material on its bottom surface with a peel away backing attached thereto, said second portion being folded back along and behind said left edge to permit attachment to the front surface of one of said

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illustration sheets along its right edge with the back surface of said writing paper page exactly overlying the back surface of said illustration sheet; said second portion overlaps said first portion and said adhesive faces said first portion and,

(c) markings along the right edge of each said writing paper page to identify hole punch areas for use in binding said writing paper pages and their associated illustration sheets along the edges thereof opposite to the edges attached to each other by said adhesive strips.

5,587,216

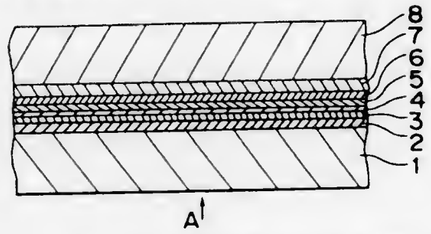
OPTICAL RECORDING MEDIUM

Kazumi Yoshioka, Yawata; Takeo Ohta, Nara; Shigeaki Furukawa, Nara-ken, and Katsumi Kawahara, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 962,112, Oct. 16, 1992, abandoned. This application Oct. 26, 1994, Ser. No. 329,682

Int. Cl.[6] B32B *3/02;* **G11B** *5/66*

U.S. Cl. 428—64.4 **2 Claims**



1. An optical recording medium which records on the basis of phase transformation, sequentially formed on one face of a transparent basic plate, comprising:

a first protection layer consisting of a mixture of ZnS and SiO_2 formed on said face of the transparent basic plate;

a recording thin film layer formed on the first protection layer which records on the basis of a phase transformation;

a second protection layer consisting of a mixture of ZnS and SiO_2 formed on the recording thin film layer;

a third protection layer of SiO_2 formed on the second protection layer;

a reflection layer formed on the third protection layer; and

wherein the third protection layer is harder than the second protection layer and has a smaller linear expansion coefficient than the first and second protection layers, the sum of the thickness of the second protection layer and the third protection layer is less than 30 nm, and is less than the thickness of the first protection layer, and wherein the second protection layer has a thickness of less than 10 nm, and is less than the thickness of the third protection layer.

5,587,217

LUBRICANT COMPOSITION AND METHOD

James L. Chao, Milpitas; Yu-Cheun Lee, Newark, and Chao Gao, Fremont, all of Calif., assignors to HMT Technology Corporation, Fremont, Calif.

Continuation-in-part of Ser. No. 270,240, Jul. 1, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 497,431

Int. Cl.[6] G11B *5/71*

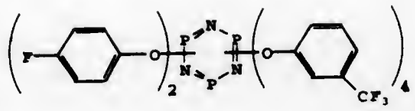
U.S. Cl. 428—65.4 **9 Claims**

1. A thin-film magnetic recording disc for use with a read/write head in a disc drive, comprising

a substrate,

a magnetic recording film formed on the substrate,

a protective overcoat formed on the recording film, and



an outer lubricant layer comprising a hexaphenoxycyclotriphosphazene lubricant and a perfluoropolyether oil, wherein each phenoxy group in the lubricant, taken separately, is substituted with one or more short chain substituents selected from the group consisting of F, CF_3, OCF_3, CF_2CF_3, CH_2CF_3, OCF_2CF_3, and OCH_2CF_3,

and wherein said hexaphenoxycyclotriphosphazene lubricant and perfluoropolyether oil are present in relative proportions effective to provide a significant reduction in frictional drag relative to the reduction in drag provided by the hexaphenoxycyclotriphosphazene lubricant or perfluoropolyether oil alone.

5,587,218

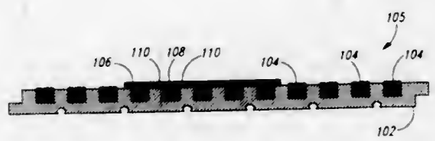
SURFACE COVERING

Richard T. Betz, 701 - 122nd Ave. NE., Bellevue, Wash. 98005

Filed May 18, 1994, Ser. No. 245,445

Int. Cl.[6] B44C *1/26*

U.S. Cl. 428—67 **18 Claims**



1. A surface covering comprising:

a base constructed from a substantially planar and rigid material, said base having first, second, third, and fourth edges and first and second opposing sides, said first and second edges being positioned in opposing relationship and said third and fourth edges being positioned in opposing relationship, said first side of said base including a plurality of working grooves extending from said first edge to said second edge of said base, said plurality of working grooves being spaced apart from one another along said first side of said base from said third edge to said fourth edge, said second side of said base including a plurality of receiving grooves extending from said first edge to said second edge of said base, said plurality of receiving grooves being spaced apart from one another along said second side of said base from said third edge to said fourth edge, each of said plurality of receiving grooves being a substantially linear groove having first and second opposing walls extending from said first edge to said second edge, each said first and second wall having a gripping projection projecting into said corresponding receiving groove and extending from said first edge to said second edge, said first side of said base including a plurality of receiving slots;

a plurality of fasteners each having a head portion and a stem portion, said plurality of fasteners being positioned in said plurality of receiving slots so that said head portion is movably secured within said slot and so that said stem portion extends outward from said slot; and

a plurality of filler strips each being a substantially compliant material positioned in respective ones of said plurality of receiving grooves and being gripped by said gripping projections of said first and second walls of said receiving grooves, each of said plurality of filler strips extending outward from said receiving grooves to provide a textured surface for said surface covering.

5,587,219

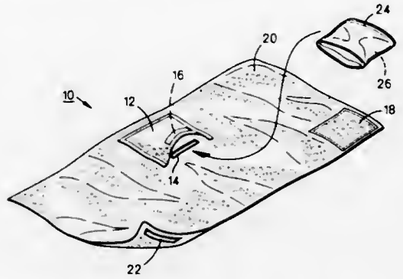
NECK CUSHIONING TOWEL

Lois E. Schofield, 27 Wildwood La., So. Hadley, Mass. 01075

Continuation of Ser. No. 382,082, Feb. 1, 1995, abandoned. This application May 1, 1996, Ser. No. 646,732

Int. Cl.[6] B32B *3/08;3/06*

U.S. Cl. 428—68 **7 Claims**



1. A neck cushioning towel for providing comfort for the cervical vertebral area of the neck and for helping to maintain the head in a neutral position to help reduce the risk of vertebral arterial injury, whereby a user's hair can be washed, rinsed or treated at a commercial sink designed with an uncushioned indentation where the cervical vertebral area of the neck rests, said neck cushioning towel comprising:

(a) a substantially rectangular towel defining upper and lower edges connected by two side edges wherein the upper and lower edges have a length greater than the two side edges;

(b) a pouch located approximately in the center of the length of said towel and positioned adjacent an upper edge;

(c) a gel-filled, removable sac for insertion into the pouch;

(d) fastening means for securing said sac in said pouch;

(e) an adjustable means attached to the towel for an adjustable fastener fit of the towel around a human being.

5,587,220

FORMED PLASTIC AND METHOD OF MANUFACTURING THE SAME

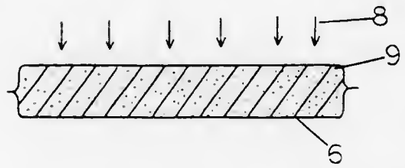
Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 913,727, Jul. 16, 1992, Pat. No. 5,461,083. This application Jun. 7, 1995, Ser. No. 485,501

Claims priority, application Japan, Jul. 26, 1991, 3-187696

Int. Cl.[6] B32B *3/14*

U.S. Cl. 428—71 **4 Claims**



2. A foamed plastic comprising a foamed resin comprising foamed cells covered with an airtight film, wherein the pressure at room temperature in the foamed cells and the pressure at room temperature in a gap region between the airtight film and foamed resin are less than atmospheric pressure, and containing a polymerized volatile foaming agent in the foamed cells, wherein said foaming agent is a monomer having a boiling point from about 30° C. to about 81° C. and having at least one unsaturated carbon bond.

5,587,221

INSECTICIDAL CARPET AND PRETREATMENT PROCESS FOR PRODUCING INSECTICIDAL CARPET

T. H. McCamy, P.O. Box 962, Dalton, Ga. 30722, and William H. H. Clark, P.O. Box 8, Ringgold, Ga. 30736

Filed Dec. 20, 1994, Ser. No. 359,401

Int. Cl.[6] B23B *3/02;* **A01N** *25/34;59/14;33/22;* **A61K** *33/22*

U.S. Cl. 428—96 **20 Claims**

1. A carpet possessing insecticidal, bactericidal and fungicidal properties, said carpet comprising a carpet backing and carpet fibers, wherein the carpet has been treated with a solution comprising:

(a) a mixture consisting of boric acid and disodium tetraborate decahydrate; and

(b) an aqueous medium.

5,587,222

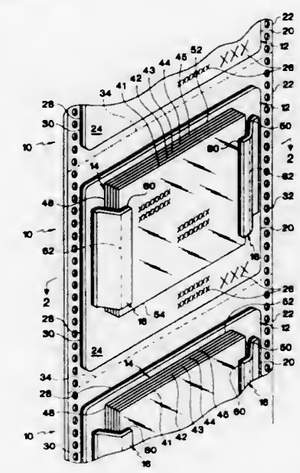
LABEL ASSEMBLY WITH MULTI-PLY INSERT

Donald J. Hoffmann, Elmhurst, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Nov. 14, 1994, Ser. No. 340,364

Int. Cl.[6] B32B *23/02*

U.S. Cl. 428—192 **35 Claims**



1. A label assembly for attaching to a product, comprising:

a base ply having an informational side and an adhesive side with an adhesive thereon for attaching to the product;

a multi-ply insert overlying a portion of said informational side of said base ply, said insert being smaller than said base ply such that an area of said informational side of said base ply is exposed for viewing indicia received thereon, said insert having a top ply with a peripheral edge; and

a pair of separately spaced fastening strips with an adhesive on one side, said adhesive of said fastening strips engaging said peripheral edge of said top ply and said informational side of said base ply for permanently securing said fastening strips to said informational side of said base ply and to said top ply along its peripheral edge, each of said fastening strips having a line of weakness extending substantially adjacent said peripheral edge of said top ply.

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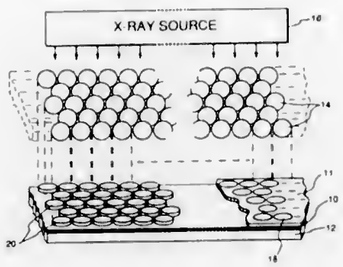
5,587,223
HIGH DENSITY MAGNETIC INFORMATION STORAGE MEDIUM

Robert L. White, Stanford, Calif., assignor to Board of Trustees Leland Stanford, Jr. University, Stanford, Calif.

Continuation of Ser. No. 963,562, Oct. 19, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 270,201
Int. Cl.[6] G11B *5/66;* B32B *3/00*
U.S. Cl. 428—195 14 Claims



1. A magnetic information storage medium comprising:
a substrate; and
a plurality of discrete, generally disk-shaped, spaced apart bodies of magnetic material disposed on said substrate with a density in excess of 10^9 bodies/in^2, each said body being magnetizable independent of its neighboring bodies and each said body having a maximum diameter of between 200 Å and 500 Å, said bodies being formed by
(a) providing a layer of magnetic material on said substrate, said layer being at least 100 Å thick and no greater than 500 Å thick, said magnetic material having uniaxial anisotropy;
(b) providing a layer of photoresist over the layer of magnetic material;
(c) providing a primary mask over said layer of photoresist, said primary mask being formed by an ordered array of discrete generally spherical polymeric particles having a diameter no greater than 750 Å;
(d) exposing said photoresist through said primary mask by flooding it with electrons, said polymeric particles causing generally disk-shaped regions of said layer of photoresist to remain unexposed;
(e) removing said primary mask;
(f) developing said photoresist to leave a plurality of discrete photoresist disks on said layer of magnetic material which form a secondary mask;
(g) subjecting the secondarily masked magnetic film to an etchant to remove magnetic material not covered by said disks; and
(h) stripping away the photoresist disks to leave said plurality of disk-shaped bodies of magnetic material disposed on said substrate.

5,587,224
DEVELOPING APPARATUS INCLUDING A COATED DEVELOPER ROLLER

Bing R. Hsieh; Joseph Mort; Mary A. Machonkin, all of Webster, and Joan R. Ewing, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

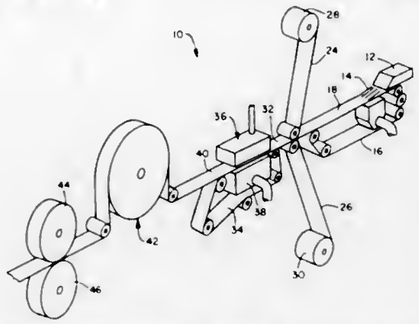
Filed Mar. 27, 1995, Ser. No. 411,359
Int. Cl.[6] G03G *15/08*
U.S. Cl. 428—195 32 Claims

1. A coated donor roll comprised of a core with a coating thereover comprised of a photolysis reaction product of a charge transporting polymer and a photo acid compound.

5,587,225
KNIT-LIKE NONWOVEN COMPOSITE FABRIC

Henry L. Griesbach, Atlanta; Christopher C. Creagan, Marietta, and Sharon W. Gwaltney, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 27, 1995, Ser. No. 430,206
Int. Cl.[6] B32B *27/14*
U.S. Cl. 428—198 17 Claims

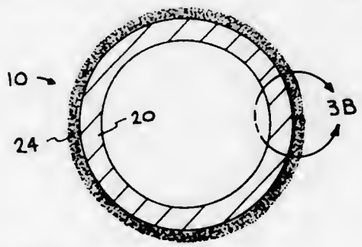


1. A launderable composite comprising:
a) a first filamentous layer, said first layer comprising crimped continuous filaments,
b) a second filamentous layer, said second layer comprising crimped continuous filaments, and
c) a cellulosic layer, said cellulosic layer comprising cellulosic fibers and having been disposed between said first and second filamentous layers,
wherein said composite is a hydroentangled pattern bonded composite that is adhesively or thermally patterned bonded forming bonded regions within said composite, and said composite loses less than about 2% of its opacity, based on the initial opacity of said composite, when subjected to one laundering cycle in accordance with the ASTM 2724-87 washing and drying procedure and wherein said first and second filamentous layers are unbonded except by means of said adhesively or thermally patterned bonds.

5,587,226
PORCELAIN-COATED ANTENNA FOR RADIO-FREQUENCY DRIVEN PLASMA SOURCE

Ka-Ngo Leung, Hercules; Russell P. Wells, Kensington, and Glen E. Craven, Fremont, all of Calif., assignors to Regents, University of California, Oakland, Calif.

Filed Jan. 28, 1993, Ser. No. 10,108
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—210 24 Claims

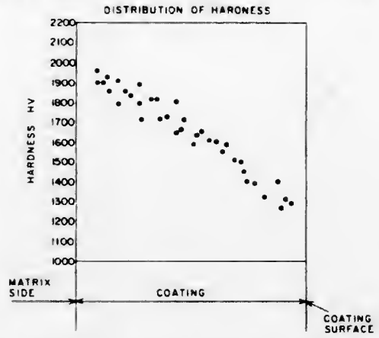


1. An antenna comprising,
a) a metal conductor;
b) a porcelain coating fused to said conductor;
c) electrical contacts for connecting said antenna to an impedance-matched power supply, and
d) an alternating-current impedance-matched power supply.

5,587,227
COATING OF CHROMIUM AND NITROGEN HAVING GOOD WEAR RESISTANCE PROPERTIES

Masaki Ooya, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 327,896
Int. Cl.[6] C23C *8/26*
U.S. Cl. 428—217 4 Claims

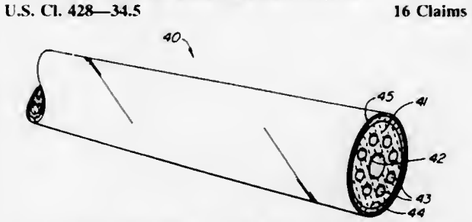


1. A wear-resistant coating provided on a surface of a substrate of a slidable component and comprising a composition of chromium and nitrogen which is chromium nitride at the portion of the coating in contact with the surface of said substrate and which continuously increases in chromium content from the substrate surface to said coating surface.

5,587,228
MICROPARTICLE ENHANCED FIBROUS CERAMICS

Anna L. Baker, and Darryl F. Garrigus, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 124,419, Jul. 28, 1993, Pat. No. 5,441,682, which is a continuation of Ser. No. 527,600, May 23, 1990, which is a continuation-in-part of Ser. No. 381,498, Jul. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 698,496, Feb. 5, 1985, Pat. No. 5,041,321, which is a continuation-in-part of Ser. No. 667,496, Oct. 18, 1984, Pat. No. 4,634,918. This application Mar. 13, 1995, Ser. No. 404,015
Int. Cl.[6] B32B *1/04;1/08;1/10;5/24*
U.S. Cl. 428—34.5 16 Claims



1. A ceramic composite which is the product of the process of:
(a) forming a slurry of ceramic components in a liquid, the components including microparticles in the size range between about 5–200 micrometers and selected from the group consisting of hollow microballoons, diatoms, solid microparticles and mixtures thereof;
(b) felting a wet mat of the ceramic components from the slurry;
(c) drying the wet mat;
(d) infusing a ceramic sol-gel binder into the dry mat;
(e) gelling and curing the binder at a temperature of no more than about 600° F. to form a glass to hold the felted ceramic components in a rigid, porous, low-density, ceramic form;
(f) optionally, infusing additional binder into the mat to increase the density and strength; and
(g) optionally, gelling and curing the subsequent infusions of binder.

5,587,229
RESILIENT, HIGH SHRINKAGE PROPYLENE POLYMER YARN AND ARTICLES MADE THEREFROM

Luciano Clementini, Terni, Italy; Adam F. Galambos, New Castle County, Del.; Giuseppe Lesca, Milan, Italy; Kumar Ogale, New Castle County, Del.; Leonardo Spagnoli, Terni, Italy, and Michael E. Starsinic, Cecil County, Md., assignors to Montell North America Inc., Wilmington, Del.

Division of Ser. No. 371,056, Jan. 10, 1995, Pat. No. 5,486,419, which is a continuation-in-part of Ser. No. 824,661, Jan. 23, 1992, abandoned. This application Sep. 21, 1995, Ser. No. 531,985
Claims priority, application Italy, May 29, 1992, MI92A1336
Int. Cl.[6] D02G *3/00;* C08L *23/00;* C08F *10/04*
U.S. Cl. 428—224 2 Claims

1. A fabric prepared from a propylene polymer yarn of increased resiliency and shrinkage, compared to crystalline propylene homopolymer yarn, comprising a continuous strand of multiple monofilament fibers, said fibers consisting essentially of a member of the group consisting of, amounts being expressed as weight %:
I. a blend of crystalline propylene homopolymer at a concentration of about 10–70% of the blend, and (a) a random crystalline terpolymer consisting essentially of about 96.0–85.0% of propylene, about 1.5–15.0% of ethylene, and about 2.5–10% of a C_4–C_8 alpha-olefin or (b) a random, crystalline, propylene polymer consisting essentially of propylene and about 1.5–20.0% of ethylene or C_4–C_8 alpha-olefins; and
II. propylene polymer material, optionally in a blend with crystalline, propylene homopolymer, said homopolymer being at a concentration up to about 70% of the blend, said propylene polymer material being selected from the group consisting of:
(a) a composition of random, crystalline, propylene polymers consisting essentially of:
(1) about 30–65% of a copolymer of about 80–98% propylene, and a C_4–C_8 alpha-olefin, and
(2) about 35–70% of a copolymer of propylene and ethylene and optionally about 2–10% of a C_4–C_8 alpha-olefin, said copolymer containing about 2–10% ethylene when said C_4–C_8 alpha-olefin is not present, and about 0.5–5% ethylene when said C_4–C_8 alpha-olefin is present;
(b) a composition of random, crystalline, propylene polymers and a predominantly ethylene copolymer, which composition consists essentially of:
(1) about 15–35% of a terpolymer of about 90–93% propylene, about 2–3.5% ethylene, and about 5–6% C_4–C_8 alpha-olefin,
(2) about 30–75% of a copolymer of about 80–90% propylene, and a C_4–C_8 alpha-olefin, and
(3) about 20–60% of a copolymer of about 91–95% ethylene, and a C_4–C_8 alpha-olefin;
(c) a heterophasic, polyolefin composition consisting essentially of:
(1) 90–55% of polymeric material selected from the group consisting of a propylene homopolymer having an isotactic index greater than 90, and a crystalline copolymer of propylene and an alpha-olefin of the formula CH_2=CHR, where R is H or C_2–C_6 alkyl, said olefinic material being less than 10% of the copolymer, and
(2) 10–45% of an elastomeric polymer of propylene and olefinic material selected from the group consisting of alpha-olefins of the formula CH_2=CHR, where R is H or C_2–C_6 alkyl, said olefinic material being 50–70% of said elastomeric copolymer being insoluble in xylene at ambient temperature.

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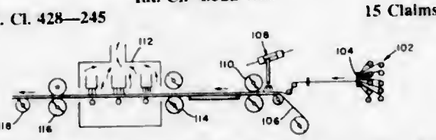
5,587,230

HIGH STRENGTH COMPOSITE

Leroy C. Lin, Richmond; Laura G. Wilson; Ashok Bhatnagar, both of Chester, all of Va., and Hsin L. Li, Parsippany, N.J., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 148,732, Oct. 29, 1993. This application Jun. 2, 1995, Ser. No. 459,133
Int. Cl.[6] B32B *7/00*
U.S. Cl. 428—245 15 Claims



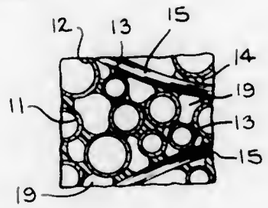
1. A method for producing a ballistic resistant article that includes at least one network of high strength fibers in a matrix composition, wherein the high strength fibers have a tenacity of at least about 7 g/d, a tensile modulus of at least about 150 g/d and an energy-to-break of at least about 8 J/g, the method comprising applying a mixture consisting essentially of at least one thermoset vinyl ester, an optional catalyst for curing the thermoset vinyl ester, diallyl phthalate and at least one carbon-carbon saturated solvent having a boiling point lower than about 115° C. to a high strength fiber network followed by consolidating the coated high strength fiber network at a temperature higher than the boiling point of the solvent and lower than about 120° C. to substantially remove the carbon-carbon saturated solvent.

5,587,231

SYNTACTIC FOAM CORE MATERIAL AND METHOD OF MANUFACTURE

Charles L. Mercer, and Thomas E. Philipps, both of Granville, Ohio, assignors to Isorcd, Inc., Granville, Ohio

Filed Jul. 29, 1994, Ser. No. 282,371
Int. Cl.[6] B32B *3/26;5/18*
U.S. Cl. 428—283 11 Claims



1. A syntactic foam core material adaptable to providing a low density rigid foam core layer for composite layered sandwich structures comprising

a layer of hollow ceramic microspheres,

dry resin powder particles finer in dimension than the diameter of said microspheres thoroughly intermixed with said layer of microspheres to provide a uniform mixture of said powder particles and microspheres,

said microspheres being present in said mixture in a percentage by volume amount of at least 60%,

said mixture of microspheres and resin powder having been processed through a cycle of heat melting and setting of said resin particles in interbonded relationship with said microspheres,

said resin particles being present in quantity to interbond said mixture into an integrated rigid syntactic foam layer while leaving void spaces within said layer upon setting of said melted resin,

said rigid foam layer having a density less than 25 pounds per cubic foot,

said layer having opposite major surfaces for combination with layers of material on opposite sides thereof in layered sandwich structures.

5,587,232

NON-MAGNETIC PARTICLES FOR NON-MAGNETIC UNDERCOATING LAYER OF MAGNETIC RECORDING MEDIUM, NON-MAGNETIC UNDERCOATING LAYER CONTAINING THE SAME, AND MAGNETIC RECORDING MEDIUM HAVING THE UNDERCOATING LAYER

Kazuyuki Hayashi; Keisuke Iwasaki; Yasuyuki Tanaka; Minoru Ohsugi; Toshiharu Harada; Masaru Isoal, and Kazushi Takama, all of Hiroshima, Japan, assignors to Toda Kogyo Corporation, Japan

Filed Aug. 4, 1993, Ser. No. 101,063
Claims priority, application Japan, Aug. 7, 1992, 4-232959
Int. Cl.[6] G11B *5/66;* B32B *5/16*
U.S. Cl. 428—323 14 Claims

1. A non-magnetic undercoating layer for a magnetic recording medium formed on a non-magnetic substrate, comprising non-magnetic particles composed of acicular or spindle-shaped α-Fe_2O_3 particles coated with at least one member selected from the group consisting of an Al compound, a silane coupling agent, a titanate coupling agent, an aluminate coupling agent and a zirconate coupling agent,

the amount of said at least one member selected from the group consisting of an Al compound, calculated as Al, a silane coupling agent, a titanate coupling agent, an aluminate coupling agent and a zirconate coupling agent being 0.01 to 50 parts by weight based on 100 parts by weight of said α-Fe_2O_3 particles; wherein

said particles have an average major axis diameter of 0.05 to 0.25 μm, an average minor axis diameter of 0.010 to 0.035 μm, an aspect ratio of 2 to 20, and a particle size distribution in geometrical standard deviation of not more than 1.40, and

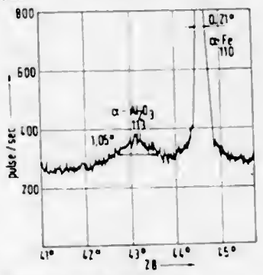
the thickness of the non-magnetic undercoating layer is 1 to 10 μm.

5,587,233

COMPOSITE BODY AND ITS USE

Udo König, Essen, Germany; Hendrikus Van Den Berg, Venlo-Blerick, Netherlands, and Ralf Tabersky, Bottrop, Germany, assignors to Widia GmbH, Essen, Germany

PCT No. PCT/DE93/00047, § 371 Date Aug. 30, 1994, § 102(e) Date Aug. 30, 1994, PCT Pub. No. WO93/20257, PCT Pub. Date Oct. 14, 1993
PCT Filed Jan. 21, 1993, Ser. No. 295,902
Claims priority, application Germany, Mar. 27, 1992, 42 09 975.7
Int. Cl.[6] B32B *18/00*
U.S. Cl. 428—325 14 Claims



1. A composite body which comprises

(a) a ceramic, sintered ceramic or cermet substrate body or a substrate body made of diamond or a nickel-based or cobalt-based alloy; and

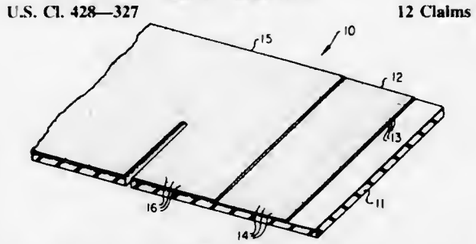
(b) at least one surface layer composed of at least one aluminum oxide with a grain size of at most 50 nm selected from the group which consists of fine crystalline γ-aluminum oxide and α-aluminum oxide, and γ-aluminum oxide modified with a fraction of amorphous alumina and α-aluminum oxide modified with a fraction of amorphous alumina deposited by plasma CVD at a substrate temperature of 400° to 750° C., with the substrate body connected as cathode and with a plasma activation produced by a pulsed direct voltage.

5,587,234

ELASTOMERIC POLYSULFIDE COMPOSITES AND METHOD

Weldon C. Kiser, Abilene, Tex., assignor to Environmental L.L.C., Abilene, Tex.

Division of Ser. No. 187,082, Jan. 26, 1994, Pat. No. 5,453,313. This application May 9, 1995, Ser. No. 437,592
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—327 12 Claims



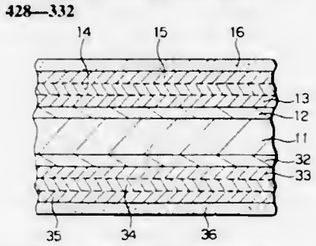
1. An elastomeric polysulfide composite comprising an elastomeric polysulfide having rubber particles distributed substantially uniformly therethrough.

5,587,235

MAGNETIC RECORDING MEDIUM AND MAGNETIC RECORDING APPARATUS

Hiroyuki Suzuki, Odawara; Naoki Kodama, Kamakura; Takao Yonekawa, Odawara; Tokuho Takagaki, Hiratsuka; Naoto Endo, Odawara; Katsuo Abe, Hiratsuka, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 193,376
Claims priority, application Japan, Feb. 19, 1993, 5-030632; Feb. 19, 1993, 5-030633
Int. Cl.[6] G11B *5/66;* B32B *5/16*
U.S. Cl. 428—332 17 Claims



1. A magnetic recording medium comprising:

a substrate;

a non-magnetic underlying layer formed on the substrate;

a plurality of stacked ferromagnetic alloy thin film layers each containing Co and at least one additional element selected from the group consisting of Cr and Ni, wherein a first one of the ferromagnetic alloy thin film layers is disposed on said non-magnetic underlying layer and another one of said plurality of ferromagnetic alloy thin film layers is disposed over said first ferromagnetic alloy thin film layer; and

an intermediate region laminated on said first one of the ferromagnetic alloy thin film layers, which intermediate region reduces magnetic interaction occurring in the stacked ferromagnetic alloy thin film layers,

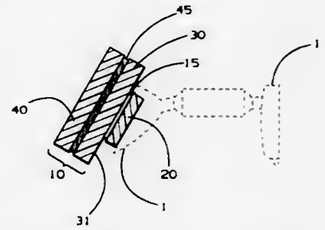
said intermediate region being one selected from the group consisting of a paramagnetic region having the same crystal structure as that of said first ferromagnetic alloy thin film layer and a region having an oxygen concentration higher than that of said first ferromagnetic alloy thin film layer.

5,587,236

INTERIOR REAR VIEW MIRROR MOUNTING SYSTEM UTILIZING ONE-PACKAGE STRUCTURAL ADHESIVE

Raj K. Agrawal; Niall R. Lynam, both of Holland, and James K. Galer, Grandville, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Division of Ser. No. 773,236, Oct. 9, 1991, abandoned. This application May 10, 1995, Ser. No. 438,612
Int. Cl.[6] A47G *1/17;* B32B *15/08;17/10;27/38*
U.S. Cl. 428—334 42 Claims



1. A mirror mounting button, windshield arrangement, comprising:

a windshield, said windshield including an interior surface;

a cured non-elastomeric, thermosetting, one-package, structural adhesive in contact with and adhered to said interior windshield surface, said adhesive having a modulus of elasticity at 85° C. of at least about 10,000 psi, said structural adhesive being a latent curing adhesive system capable of substantial cure at a temperature below about 325° F. and requiring exposure to a temperature in excess of about 125° F. before substantial curing is achieved; and

a mirror mounting button attached to said adhesive, whereby said cured adhesive forms a bond between said windshield and said mirror mounting button, wherein said adhesive bond can support a weight greater than or equal to about 100 grams.

5,587,237

PRESSURE SENSITIVE ADHESIVE

Ralf Korpman; Vera Korpman, both of Bridgewater, N.J.; Michael Korpman, Longwood, Fla., and Dennis Korpman, Beaumont, Tex., assignors to Ralf Korpman Associates, Inc., Bridgewater, N.J.

Continuation of Ser. No. 134,924, Oct. 7, 1993, abandoned, which is a division of Ser. No. 977,580, Nov. 17, 1992, Pat. No. 5,274,036. This application Feb. 14, 1995, Ser. No. 389,061
Int. Cl.[6] C09J *7/02*
U.S. Cl. 428—355 3 Claims

1. A health care pressure-sensitive adhesive product having improved skin tack and skin adhesion characteristics comprising a flexible backing having coated on at least one side thereof said pressure-sensitive composition, said pressure sensitive composition comprising a solid rubber and a liquid rubber wherein the weight ratio of said solid rubber to said liquid rubber being from about 1:0.5 to about 1:7 ,said liquid rubber being selected from the group consisting of liquid isoprene-styrene, liquid butadiene-styrene, liquid carboxyl terminated isoprene, liquid hydroxyl terminated isoprene and liquid hydrogenated isoprene, wherein said composition is substantially tackifying resin free.

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5,587,238

COMPOSITION HAVING A BASE OF CELLULOSE FORMATE CAPABLE OF PRODUCING FIBERS OR FILMS

Jean-Paul Meraldi; Vlastimil Cizek, and Rima Huston, all of Zurich, Switzerland, assignors to Michelin Recherche Et Techni UE S.A., Granges - Pacot, Switzerland

Division of Ser. No. 302,753, Sep. 13, 1994. This application Jun. 6, 1995, Ser. No. 466,573

Claims priority, application France, Jan. 27, 1993, 93 01121

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—357 **6 Claims**

1. A regenerated cellulose fiber, characterized by the following points:

a) the degree of substitution of the cellulose by formate groups is less than 3%;

b) the fiber is formed of filaments each of which has, in cross section, a morphology which is practically continuous from the periphery up to the core;

c) the mechanical properties of the conditioned fiber are as follows: $T \geqq 10$ cN/tex; $M_i \geqq 500$ cN/tex; $A_R > 5\%$; T being the tenacity, M_i being the initial modulus, and A_R being the elongation upon rupture.

5,587,239

BALL-LIKE STRUCTURES AND CONTACTING MATERIALS FOR WASTEWATER-TREATMENT

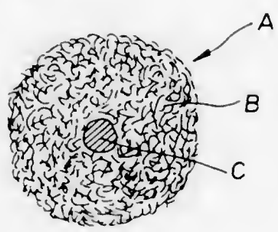
Hisaaki Ueba; Yoslo Sunaga, and Tosio Nagasima, all of Tochigi-ken, Japan, assignors to Kureha Kagaku Kogyo Kabushiki, and Kureha Gosen Kabushiki Kaisha, both of Japan

Filed Jun. 27, 1994, Ser. No. 265,963

Claims priority, application Japan, Jun. 29, 1993, 5-185611

Int. Cl.[6] D02G *3/00;* **B32B** *5/16;* **B01D** *39/08*

U.S. Cl. 428—362 **4 Claims**



1. Ball structures formed from bundled, crimped fibers rounded around a central portion thereof as a core, the core being formed from molten-fused fibers and having the following characteristics:

(a) a ratio of the specific gravity of the molten-fused fibers forming the ball structures divided by the specific gravity of the material that forms the fibers, expressed as a percentage, of at least 75%,

(b) a length of the molten-fused fibers of 5 to 50% based on diameter of the ball structures,

(c) a withdrawing strength of a crimped fiber strand connected to the molten-fused fibers of not less than 50% based on a linear strength of the crimped fiber strand itself used for the ball structures,

(d) a core volume of 1 to 30% based on the volume of the ball structures, and

(e) a crimping rate of the crimped fibers of from 10 to 75%.

5,587,240

CARBON FIBERS AND PROCESS FOR PREPARING SAME

Masanobu Kobayashi, Ehime; Motoi Itoh, Iyo; Yoji Matsuhisa, Ehime, and Kazuharu Shimizu, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

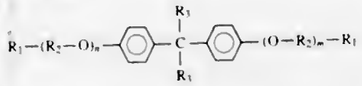
Division of Ser. No. 293,817, Aug. 22, 1994, Pat. No. 5,462,799. This application Jun. 5, 1995, Ser. No. 462,753

Claims priority, application Japan, Aug. 25, 1993, 5-210282; Jan. 14, 1994, 6-002582; Feb. 16, 1994, 6-019219

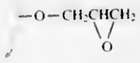
Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—367 **4 Claims**

1. A carbon fiber having a surface oxygen concentration (O/C ratio) of 0.20–0.02 and a surface nitrogen concentration (N/C ratio) of 0.02–0.30, as measured by x-ray photoelectron spectroscopy, and comprising a sizing agent having an aromatic compound which has multiple epoxy groups, wherein the number of atoms between the epoxy groups and an aromatic ring is 6 or greater, wherein the aromatic compound with multiple epoxy groups in which the number of atoms between the epoxy groups and an aromatic ring is 6 or greater is a compound represented by the following formula,



wherein R_1 represents the following group,



R_2 represents an alkylene group of 2–30 carbon atoms, R_3 represents —H or —CH_3, and m and n are each an integer of 2–48, m+n being 4–50.

5,587,241

MINERAL FIBERS AND WHISKERS EXHIBITING REDUCED MAMMALIAN CELL TOXICITY, AND METHOD FOR THEIR PREPARATION

Gerald L. Vaughan, 2417 W. Gallaher Ferry Rd., Knoxville, Tenn. 37932, and Samuel C. Weaver, 5440 Glen Cove Dr., Knoxville, Tenn. 37919

Filed Jun. 1, 1995, Ser. No. 457,851

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—375 **4 Claims**

1. Improved mineral fibers and whiskers exhibiting abatement of cytotoxicity toward mammalian cells which consist of mineral fibers and whiskers each completely coated with an agent that confers hydrophobicity to said fibers and whiskers, said agent selected from the group consisting of organic halogenated silanes and silicones.

5,587,242

COLORED POLYMERIC DIELECTRIC PARTICLES AND METHOD OF MANUFACTURE

Wei-Hsin Hou; Thomas B. Lloyd, both of Bethlehem, Pa., and Frederic E. Schubert, Shoreham, N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

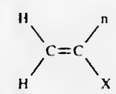
Division of Ser. No. 241,349, May 11, 1994, Pat. No. 5,498,674, which is a division of Ser. No. 65,572, May 21, 1993, Pat. No. 5,360,689. This application Nov. 21, 1995, Ser. No. 561,249

Int. Cl.[6] C08F *236/20*

U.S. Cl. 428—402 **7 Claims**

1. A plurality of dielectric particles for use in an electrophoretic fluid, said particles being formed by a process comprising the steps of:

polymerizing a monomer selected from the group consisting of vinyl halide monomers and vinyl monomers having the formula



where X is selected from the group consisting of a halide, carboxyl, ether trialkylammonio, acetate, diazoniodialkylsulfonio, cyano, and oxyl imino using dispersion polymerization to form irregularly-shaped crystalline polymer particles, and where n is selected as H or X; wherein said step of polymerization includes:

(a) admixing said monomer and a crosslinker in a dispersion medium to form a first mixture;

(b) preparing a second mixture of an initiator and a dispersion stabilizer for retarding the coagulation of said particles during said polymerization;

(c) adding said first mixture to said second mixture to form a third mixture and allowing said monomer to polymerize to form said irregularly shaped crystalline polymer particles; and

(d) sonifying said third mixture after polymerization to make said irregularly-shaped crystalline polymer particles uniform in size.

6. The dielectric particles of claim 1, wherein said size of said particles in step (d) is in the range from 0.5 to 5.0 micrometers.

5,587,243

EPOXY RESIN MIXTURES CONTAINING PHOSPHONIC/PHOSPHINIC ACID ANHYDRIDE ADDUCTS

Wolfgang von Gentzkow, Kleinsendelbach; Jürgen Huber, Erlangen; Heinrich Kapitza, Fürth; Wolfgang Rogler, Möhrendorf; Hans-Jerg Kleiner, Kronberg, and Dieter Wilhelm, Forchhein, all of Germany, assignors to Siemens Aktiengesellschaft, München, and Hoechst Aktiengesellschaft, Frankfurt, both of Germany

PCT No. PCT/EP94/00747, § 371 Date Sep. 14, 1995, § 102(e) Date Sep. 14, 1995, PCT Pub. No. WO94/21703, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 10, 1994, Ser. No. 522,332

Claims priority, application Germany, Mar. 15, 1993, 43 08 187.8

Int. Cl.[6] C08G *59/14;59/40;59/50;* **H05K** *1/03*

U.S. Cl. 428—413 **17 Claims**

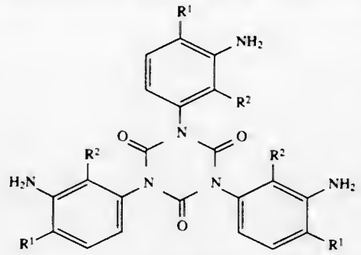
1. An epoxy resin mixture for producing prepregs and composites, comprising:

a phosphorus-modified epoxy resin with an epoxy value of 0.02 to 1 mol/100 g, and an average molecular weight M_n of up to 10,000, which is a reaction product of

(A) a polyepoxy compound with at least two epoxy groups per molecule and

(B) a phosphinic acid anhydride or a phosphonic acid anhydride, or a mixture thereof, and

an aromatic polyamine hardener with the following structure:



where one of the R^1 and R^2 groups on each of the three aromatic rings denotes a hydrogen and the other is an alkyl.

5,587,244

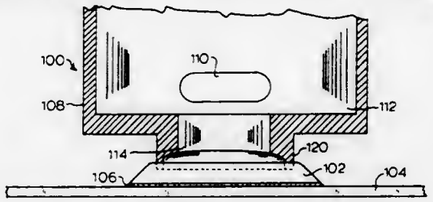
LOW PRESSURE MEDICAL SILICONE GASKET

David E. Flinchbaugh, 4855 Big Oaks La., Orlando, Fla. 32806

Continuation of Ser. No. 625,379, Dec. 11, 1990, abandoned. This application Jul. 30, 1992, Ser. No. 923,021

Int. Cl.[6] B32B *25/20;* **B65D** *53/06;* **F16J** *15/00*

U.S. Cl. 428—447 **1 Claim**



1. A seal or gasket comprising a core body having a shore (00) durometer hardness value of from about 2 to about 20 formed of thermally addition curable silicone elastomer and thereafter post cured by heating of the previously heat cured core body with a silicone release agent applied to an exterior surface of the core body at sufficient temperature and time to incorporate the silicone release agent with the core body to form a deformable non-stick skin on the core body, wherein the skin has a reduced adherence character as compared to said exterior surface of the core body prior to application and post curing with said silicone release agent.

5,587,245

FUSING MEMBER HAVING ZINC OXIDE-FILLED, ADDITION CURED LAYER

Susan A. Visser; Charles E. Hewitt; Tonya D. Binga, all of Rochester; Wayne T. Ferrar, Fairport; Michael W. Fichtner, Rochester, and John J. Fitzgerald, Clifton Park, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,149

Int. Cl.[6] B32B *25/20*

U.S. Cl. 428—447 **23 Claims**

1. A fuser member comprising a core and a layer overlying said core, said layer comprising: an addition crosslinked polyorganosfloxane elastomer, said layer having zinc oxide particles dispersed therein in a concentration of from 20 to 40 volume percent of the total volume of said layer, said elastomer comprises the product of addition crosslinking vinyl substituted multifunctional siloxane

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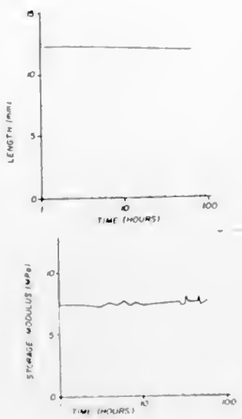


polymers having a weight average molecular weight between vinyl groups of from 7,000 to 100,000.

5,587,246

WATER-RESISTANT SURFACE COATING FORMULATIONS AND PAPER COATED THEREWITH

Haruki Tsutsumi; Yoshiaki Ikemoto, both of Kanagawa-ken; Mitsuhiro Maehama, Yamaguchi-ken; Toshiki Oyanagi, and Tsugio Matsubara, both of Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

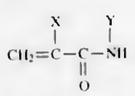
Division of Ser. No. 248,183, May 24, 1994, Pat. No. 5,470,918. This application May 26, 1995, Ser. No. 450,149

Claims priority, application Japan, May 28, 1993, 5-126829

Int. Cl.[6] B32B *23/08;27/10*

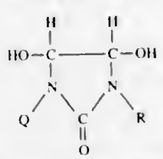
U.S. Cl. 428—511 **8 Claims**

5. Paper coated with a water-resistant surface coating formulation comprising a reaction product obtained by reacting an acrylamide polymer of at least one acrylamide monomer represented by the following formula (1):



(1)

wherein X represents H or CH_3 and Y represents H or CH_2OH, and, optionally, at least one comonomer selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile and itaconic acid, with 0.1 to 20 parts by mole, per 100 parts by mole of amido groups in the acrylamide polymer, of a glyoxalmonoureine represented by the following formula (2):



(2)

wherein Q and R independently represent H, CH_3 or CH_2OH; wherein the acrylamide polymer is produced from 100 to 60 parts by mole of the at least one acrylamide represented by the formula (1) and 0 to 40 parts by parts by mole of at least one comonomer selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile and itaconic acid.

5,587,247

RESIN COMPOSITION FOR EXTRUSION MOLDING

Kohji Kubo; Shoichi Nezu; Fumio Ishibashi; Hiroyuki Harada, and Yuji Shigematsu, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 29, 1994, Ser. No. 350,074

Claims priority, application Japan, Nov. 29, 1993, 5-298276; May 23, 1994, 6-108183

Int. Cl.[6] C08L *23/08;23/04;* **B32B** *27/32;* **C08K** *5/00*

U.S. Cl. 428—523 **6 Claims**

1. A resin composition for extrusion molding which has a melt flow rate (MFR) of from 0.5 to 30 g/10 min., comprising:

(A) 1 to 80 parts by weight of at least one polymer selected from the group consisting of low density polyethylene and copolymers of ethylene and at least one comonomer selected from the group consisting of unsaturated carboxylic acids, esters of unsaturated carboxylic acids containing 4 to 8 carbon atoms and vinyl esters, which gives an endothermic peak in a temperature range of from 80° to 120° C. in a temperature rise thermogram as measured by a differential scanning calorimeter, has a melt flow rate (MFR) of from 0.5 to 50 g/min., and is prepared by high-pressure radical polymerization,

(B) 5 to 80 parts by weight of a copolymer of ethylene and an α-olefin containing 6 to 8 carbon atoms which gives at least one endothermic peak in a temperature range of from 118° to 130° C. in a temperature rise thermogram as measured by a differential scanning calorimeter, has a melt flow rate (MFR) of from 0.5 to 30 g/10 min., a density of from 0.900 to 0.935 g/cm^3, and

(C) 5 to 70 parts by weight of a copolymer of ethylene and an α-olefin containing 3 to 8 carbon atoms which has a melt flow rate (MFR) of from 0.5 to 30 g/10 min. and a density of from 0.902 to 0.920 g/cm^3 in an unannealed state, gives no endothermic peak at temperatures above 110° C. in a temperature rise thermogram as measured by a differential scanning calorimeter, has a cooled-xylene portion which is not more than 30% by weight, and which has a ratio of a main component given by the formula:

$C_n(\%)$=(parts by weight of components which are dissolved in a solvent at solvent temperatures between T_L and T_H)× 100/(parts by weight of components which are dissolved in a solvent at solvent temperatures at 120° C.) wherein

T_L (°C.)=$T_A-\{-4.61\times\sigma^2\times\log(0.0125\times\sigma)\}^{1/2}-6.15\times(\log(MFR)+1)$, and

T_H(°C.)=$T_A-\{-4.61\times\sigma^2\times\log(0.0125\times\sigma)\}^{1/2}$, wherein

$T_A=-5028\times d^2+10481\times d-5303$, and

$\sigma=525.9\times d^2-1096.3\times d+565.6$, in which

d is a density as measured in an unannealed state (g/cm^3),

and o-dichlorobenzene (ODCB) is used as a solvent, is not less than 80%, and the total quantity of (A), (B) and (C) being 100 parts by weight.

5,587,248

CORROSION RESISTANT NICKEL PLATING STEEL SHEET OR STRIP AND MANUFACTURING METHOD THEREOF

Hitoshi Ohmura, Yamaguchi-ken; Yasuhiro Koyakumaru, and Satoshi Iketaka, both of Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 78,920, Jun. 21, 1993, abandoned. This application Mar. 3, 1995, Ser. No. 400,387

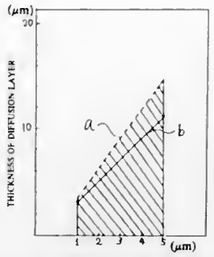
Claims priority, application Japan, Jun. 22, 1992, 4-188628

Int. Cl.[6] C25D *5/26;* **B32B** *15/01*

U.S. Cl. 428—610 **3 Claims**

1. A corrosion-resistant steel sheet or strip comprising a base sheet made of a cold rolled steel sheet or strip and a diffusion layer consisting essentially of iron and nickel and having a thickness in the range of 0.3 to 10.9 μm on at least one surface of said base sheet as a top exposed layer, wherein

said diffusion layer being formed by recrystallizing a nickel layer which has been electroplated on at least one surface of said base sheet;



said nickel layer having a thickness in the range of about 1 to 5 μm prior to forming said diffusion layer;

a ratio of said thickness of said diffusion layer to said thickness of said nickel layer prior to forming said diffusion layer being in the range of 10 to 333%;

an iron exposure rate at the top surface of the top exposed layer is in the range of 4% to 30%.

5,587,249

Patent Not Issued For This Number

5,587,250

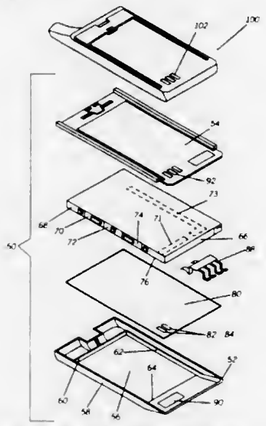
HYBRID ENERGY STORAGE SYSTEM

George Thomas, Lawrenceville, and Georgina Moré, Duluth, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 27, 1995, Ser. No. 534,517

Int. Cl.[6] H01M *16/00*

U.S. Cl. 429—3 **15 Claims**



1. A hybrid energy storage system comprising:

a first energy storage device consisting of a secondary battery selected from the group consisting of lead-acid batteries, nickel cadmium batteries, nickel metal hydride batteries, lithium ion batteries, lithium polymer batteries, and combinations thereof for providing a constant current output of less than 1 ampere;

a second energy storage device consisting of an electrochemical capacitor device for providing intermittent bursts of current greater than 1 ampere; and

output electronics electrically coupled to said first and second energy storage devices for conditioning the output thereof, and for electrically coupling said energy storage devices to a load.

5,587,251

CERAMIC GAS SUPPLY COMPONENTS FOR FUEL CELLS COMPRISING ZIRCONIUM OXIDE SOLID ELECTROLYTE

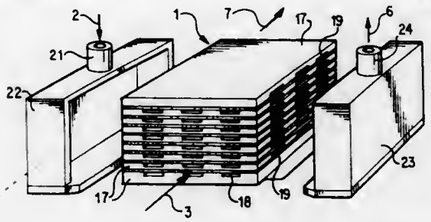
Richard Spaeh, Ueberlingen; Wolfgang Schaefer, Friedrichshafen; Detlef Stolten, Uhldingen, and Marco Fandel, Immenstaad, all of Germany, assignors to Dornier GmbH, Immenstaad, Germany

Filed Dec. 17, 1993, Ser. No. 168,251

Claims priority, application Germany, Dec. 17, 1992, 42 42 728.2

Int. Cl.[6] H01M *8/10;2/00*

U.S. Cl. 429—33 **17 Claims**



1. A gas manifold for a solid electrolyte fuel cell comprising an electrically insulating gas-tight ceramic formed from a mixture of a first ceramic component having a coefficient of thermal expansion less than that of said solid electrolyte and a second ceramic component having a coefficient of thermal expansion greater than that of said solid electrolyte, said first and second ceramic components being present in said mixture in such proportions that the ceramic formed from the mixture has a coefficient of thermal expansion substantially corresponding to that of said solid electrolyte.

5,587,252

PROCESS FOR DISPOSING OF SPENT NAS CELLS

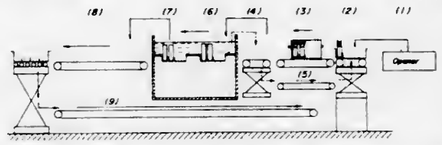
Tomonori Tsuchimoto, Hashima-Gun; Katsuichi Iwata, Ichinomiya, and Yoshihiko Kurashima, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 7, 1995, Ser. No. 483,160

Claims priority, application Japan, Jul. 20, 1994, 6-167739; Jun. 1, 1995, 7-135265

Int. Cl.[6] H01M *10/54*

U.S. Cl. 429—49 **9 Claims**



1. A process for disposing of a spent NaS cell, comprising the steps of:

cutting the NaS cell to form at least one opening to expose an inner tube and sodium in the NaS cell;

flowing oil into the NaS cell through the at least one opening while the NaS cell is positioned upright, to cover the sodium with the oil;

inverting the NaS cell such that the at least one opening faces a downward direction, the NaS cell being supported by a workpiece setting vessel that provides access to permit removal of the inner tube through the at least one opening;

immersing the NaS cell supported by the workpiece setting vessel in heated oil provided in a heating oil vessel while the NaS cell is inverted, whereby the sodium in the NaS cell is melted and flows out of the NaS cell; and

removing the inner tube from the NaS cell through the at least one opening.

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5,587,253

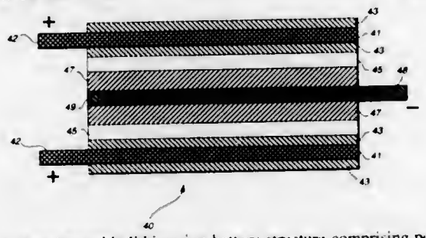
LOW RESISTANCE RECHARGEABLE LITHIUM-ION BATTERY

Antoni S. Gozdz, Tinton Falls; Caroline N. Schmutz, Eatontown, and Paul C. Warren, Far Hills, all of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 160,018, Nov. 30, 1993, Pat. No. 5,460,904, which is a continuation-in-part of Ser. No. 110,262, Aug. 25, 1993, Pat. No. 5,418,091, which is a continuation-in-part of Ser. No. 26,904, Mar. 5, 1993, Pat. No. 5,296,318. This application Aug. 3, 1995, Ser. No. 510,835

Int. Cl.[6] H01M *4/64;10/36*

U.S. Cl. 429—192 **12 Claims**



1. A rechargeable lithium-ion battery structure comprising positive and negative electrode layer elements having a separator element disposed therebetween and current collectors associated therewith, each of said elements comprising a flexible, polymeric matrix film composition and being bonded to contiguous elements at its respective interfaces to form a unitary flexible structure characterized in that

a) said positive electrode layer element comprises a composition of a lithium ion intercalating compound selected from the group consisting of $Li_xMn_2O_4$, Li_xCoO_2, and Li_xNiO_2; and

b) at least one of said current collectors is embedded within its associated electrode layer.

5,587,254

ALKALINE BATTERY HAVING A GELLED NEGATIVE ELECTRODE

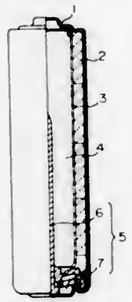
Yuri Kojima, Katano; Yuji Mototani, Yawata, and Junichi Asaoka, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 7, 1995, Ser. No. 419,054

Claims priority, application Japan, Apr. 21, 1994, 6-083089

Int. Cl.[6] H01M *4/24;4/62*

U.S. Cl. 429—206 **6 Claims**



1. An alkaline battery provided with a gelled negative electrode comprising a zinc alloy powder, a gelling agent and an alkaline electrolyte;

said gelling agent comprising a combination of:

a crosslinked polyacrylate water-absorbing polymer having a dispersion viscosity at 25° C. of at least 15,000 cps as a 0.5 wt % aqueous solution and having a particle size of 100–900 microns; a crosslinked and branched polyacrylic acid or a salt thereof having a dispersion viscosity at 25° C. of at least 15,000 cps as a 0.5 wt % aqueous solution and having a particle size of 100–900 microns;

the concentration of said crosslinked polyacrylate water-absorbing polymer being in the range of from 0.25 wt % to 3.0 wt %, the concentration of said crosslinked and branched polyacrylic acid or salt thereof being in the range of from 0.1 wt % to 1.0 wt %, the concentration of said granular crosslinked and branched polyacrylic acid or salt thereof being in the range of from 0.1 wt % to 2.0 wt %, and the total concentration of said gelling agent being in the range of more than 1.50 wt % but at most 4.0 wt %, and the total concentration of said gelling agent being in the range of more than 1.50 wt % but at most 4.0 wt %, all the concentrations being based on the weight of the alkaline electrolyte.

5,587,255

CARBONACEOUS ELECTRODE MATERIAL FOR SECONDARY BATTERY

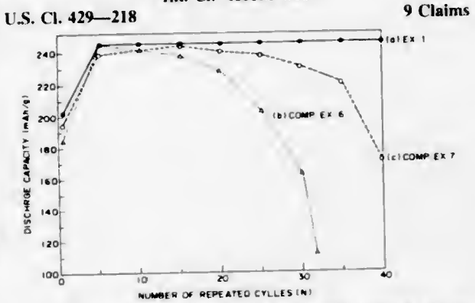
Naohiro Sonobe; Koji Maruyama, and Takao Iwasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 199,810

Claims priority, application Japan, Feb. 25, 1993, 5-059427; Nov. 26, 1993, 5-319288

Int. Cl.[6] H01M *4/02*

U.S. Cl. 429—218 **9 Claims**



1. A carbonaceous electrode material for a non-aqueous solvent-type secondary battery, comprising a pitch carbonaceous material having an average (002)-plane spacing of at least 0.365 nm according to an X-ray diffraction test, wherein said carbonaceous material is characterized by providing a residual carbonaceous substance showing an average (002) planer-spacing of at most 0.350 nm according to an X-ray diffraction test after said carbonaceous material is tested by treatment with an $H_2O—N_2$ equi-molar gaseous mixture at 900° C. up to a weight reduction of 60%.

5,587,256

CARBONACEOUS INSERTION COMPOUNDS AND USE AS ANODES IN RECHARGEABLE BATTERIES

Alfred M. Wilson, Burnaby, and Jeffery R. Dahn, Surrey, both of Canada, assignors to Moli Energy (1990) Limited, Canada

Filed Apr. 25, 1995, Ser. No. 428,042

Claims priority, application Canada, Jul. 8, 1994, 2127621

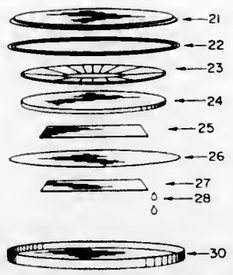
Int. Cl.[6] H01M *4/02*

U.S. Cl. 429—218 **46 Claims**

1. A carbonaceous insertion compound comprising:

(a) a pre-graphitic carbonaceous host C;

(b) atoms of an alkali metal A inserted into the host C, the amount of metal A being in a range from greater than or equal to zero; and



(c) atoms of an element B selected from the group consisting of Al, Bi, Cd, Pb, Sb, and Sn incorporated into the host C, the amount of element B being greater than zero, wherein element B alloys with metal A and the atoms of element B are incorporated predominantly as monodispersed atoms in the host C;

wherein said carbonaceous insertion compound has a reversible specific capacity for said alkali metal greater than graphite.

5,587,257

METHOD OF MAKING LITHIUM-ION CELL HAVING DEACTIVATED CARBON ANODES

Gary G. Tibbetts, Birmingham; Gholam-Abbas Nazri, Bloomfield Hills, and Blake J. Howie, Almont, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 14, 1995, Ser. No. 514,896

Int. Cl.[6] H01M *4/58*

U.S. Cl. 429—218 **15 Claims**

1. In the method of making a secondary, lithium-ion cell including the principle step of positioning an anode and a cathode opposite each other with a non-aqueous, lithium-ion conducting electrolyte therebetween wherein said anode comprises a reversible-lithium-intercalateable carbon and said cathode comprises a reversible-lithium-intercalateable material, the improvement comprising, prior to said positioning, heating said carbon in the presence of oxygen for a time and at a temperature sufficient to selectively oxidize, gasify and remove from said carbon at least those highly reactive carbon atoms therein that would otherwise decompose said electrolyte and/or entrap lithium in said cell.

5,587,258

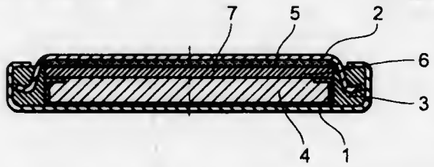
GALVANIC CELL HAVING IMPROVED CATHODE

Gerd Fehrmann, Pirna; Rainer Frömmel, Dresden, and Rüdiger Wolf, Rabenau, all of Germany, assignors to Litronik Batterietechnologie GmbH & Co., Pirna, Germany

Filed Jan. 5, 1996, Ser. No. 583,611

Int. Cl.[6] H01M *4/56;4/50*

U.S. Cl. 429—228 **12 Claims**



1. A galvanic cell which has a high energy density, a high power density, a low self discharge, and an open circuit voltage which is related to state of discharge, and which is useful for supplying electrical power to a device which has a large current consumption and which is implantable in a living being including a defibrillator and a nerve stimulator, the galvanic cell comprising:

a casing;

a cathode unit having at least one electrode and, when a plurality of electrodes are provided, the electrodes of the plurality are separated and are electrically connected to one another, which at least one electrode of the cathode unit is comprised of a mixture of at least one metal oxide and at least one lead compound, which mixture is selected from the group consisting of:

(a) a mixture of CrO_x in which x ranges between 2.5 and 2.7 and at least one lead compound which is selected from the group consisting of $PbCrO_4$, $PbMoO_4$ and PbO,

(b) a mixture of CrO_x in which x ranges between 2.5 and 2.7, MnO_2, and at least one lead compound which is selected from the group consisting of $PbCrO_4$, $PbMoO_4$ and PbO, and

(c) a mixture of MnO_2 and a lead compound which is PbO;

an anode unit having at least one electrode comprised of an alkali metal and, when a plurality of electrodes are provided, the electrodes of the plurality are separated and are electrically connected to one another, which at least one electrode of the anode unit is placed one of near the at least one electrode of the cathode unit or between respective electrodes of the cathode unit; and

an organic electrolyte comprised of a mixture of (a) at least one carbonate selected from the group consisting of ethylene carbonate and propylene carbonate, (b), 2-dimethoxyethane, and (c) a conducting salt.

5,587,259

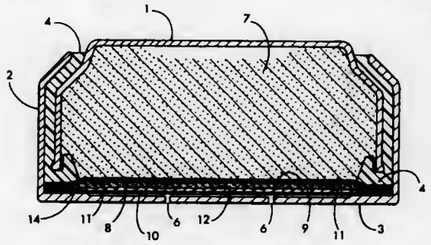
METAL-AIR CATHODE AND CELL HAVING A HARDENED CURRENT COLLECTING SUBSTRATE

Robert B. Dopp, Madison; John E. Oltman, Mount Horeb, and Joseph L. Passaniti, Madison, all of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Mar. 9, 1994, Ser. No. 208,450

Int. Cl.[6] H01H *2/20*

U.S. Cl. 429—233 **31 Claims**



1. A current collecting substrate in an air cathode of an electrochemical metal-air cell having a metal anode and an alkaline electrolyte, the substrate comprising:

(a) a metal structure having a mean hardness exceeding about 110 micro-Vickers and capable of being connected to electrical circuitry, the metal of the structure being suitable for operation in the alkaline electrolyte.

5,587,260

METHOD OF FORMING A FUNCTIONAL FILM

Susumu Miyazaki, Kitasouma-gun; Tsuyoshi Nakano, Funabashi; Nobuya Niizaki, Yokohama; Junichi Yasukawa, Chigasaki, and Miki Matsumura, Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 13, 1994, Ser. No. 304,950

Claims priority, application Japan, Sep. 13, 1993, 5-227488

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—7 **7 Claims**

1. A method of forming a functional film micropatterned on a substrate comprising:

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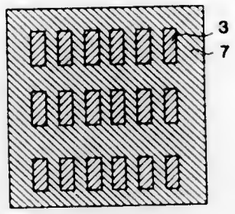


(a) a step of forming a positive or negative-type photoresist film on the entire surface of a substance having a conductive layer thereon;

(b) an exposure step of irradiating light to the surface of the already formed positive or negative-type photoresist film through overlapped photo-masks having patterns that allow the film to cover the substrate except for a predetermined portion for forming a functional film in the next developing step;

(c) a developing step of removing the photoresist film from the predetermined portion for forming a functional film;

(d) a step of forming a functional film on the substrate in the portion where said photoresist film is removed, by electrodeposition with said conductive layer as one electrode; and

(e) a step of removing the positive or negative-type photoresist film remaining after the step (c);

wherein a step of heat-treating the films remaining after the developing step (c) at 80°–280° C. for 5–60 minutes is included before the step (d).

5,587,261

UV/EB CURABLE BUTYL COPOLYMERS FOR LITHOGRAPHIC AND CORROSION-RESISTANT COATING

Jay D. Audett, Brown Deer, Wis., and Kenneth O. McElrath, Waterloo, Belgium, assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Division of Ser. No. 298,450, Oct. 27, 1994, which is a division of Ser. No. 982,104, Nov. 24, 1992, Pat. No. 5,376,503, which is a continuation of Ser. No. 631,610, Dec. 20, 1990. This application Jun. 7, 1995, Ser. No. 473,858

Int. Cl.[6] G03C *3/00;* **G03F** *7/00;* **B41N** *1/00;6/00*

U.S. Cl. 430—18 **1 Claim**

1. An article having printing elements made by:

(a) coating at least a portion of a surface of an article with a composition comprising a random copolymer of an isoolefin of 4 to 7 carbon atoms and para-alkylstyrene comonomer, said isoolefin comprising 10 to 99.5 weight % of said copolymer and said para-alkylstyrene comprises 0.5 to 90 weight % of said copolymer, wherein about 0.5 to 55 weight % of said copolymer comprises para-alkylstyrene monomers having a photoinitiator substituted on the pendent alkyl group, said copolymer having a substantially homogenous compositional distribution;

(b) selectively exposing said surface to gamma, UV, electron beam, visible, or microwave radiation to crosslink the copolymer in the area exposed to said radiation; and

(c) removing the uncrosslinked copolymer to develop a pattern of the crosslinked copolymer.

5,587,262

PHOTOCONDUCTIVE IMAGING MEMBERS

Heidi Pinkney, Hamilton; Ah-Mee Hor, and Zoran D. Popovic, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1995, Ser. No. 537,015

Int. Cl.[6] G03G *5/047*

U.S. Cl. 430—54 **27 Claims**

1. A photoconductive imaging member comprised of a supporting substrate, a hydroxygallium phthalocyanine photogenerator layer, a charge transport layer, a photogenerator layer comprised of a mixture of bisbenzimidazo(2,1-a-1',2'-b)anthra(2,1,9-def:6,5,10-d'e'f')diisoquinoline-6,11-dione and bisbenzimidazo(2,1-a:2',1'-a)anthra(2,1,9-def:6,5,10-d'e'f')diisoquinoline-10, 21-dione, and as a top layer a charge transport layer.

5,587,263

ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING TRIARYLAMINE COMPOUNDS

Katsumi Nukada; Akira Imai, and Ryosaku Igarashi, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

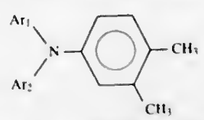
Division of Ser. No. 215,582, Mar. 22, 1994, Pat. No. 5,495,049. This application May 18, 1995, Ser. No. 444,274

Claims priority, application Japan, Mar. 22, 1993, 5-85153; May 17, 1993, 5-136927; Jul. 7, 1993, 5-191821

Int. Cl.[6] C07C *211/54;211/60;211/61*

U.S. Cl. 430—56 **21 Claims**

1. An electrophotographic photoreceptor comprising a photosensitive layer containing as a charge transport material at least one triarylamine compound represented by formula (I)



(I)

wherein Ar_1 and Ar_2 each represents a phenyl group, a phenyl group substituted with an alkyl group having 1–5 carbon atoms or an alkoxy group having 1–5 carbon atoms or a condensed ring group that is a naphthyl group, an anthracenyl group, a pyrenyl group, a fluorenyl group or any of a naphthyl group, an anthracenyl group, a pyrenyl group, or a fluorenyl group substituted with an alkyl group having 1–5 carbon atoms.

5,587,264

ELECTROSTATIC INFORMATION RECORDING MEDIUM AND ELECTROSTATIC INFORMATION RECORDING AND REPRODUCING METHOD

Masayuki Iijima; Kyoji Dantani; Hiroyuki Obata; Makoto Matsuo; Minoru Utsumi, and Seiji Take, all of Tokyo, Japan, assignors to Dai Nippon Printing Co. Ltd., Tokyo, Japan

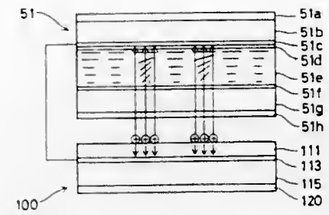
Continuation of Ser. No. 981,141, Nov. 24, 1992, abandoned, which is a division of Ser. No. 613,689, Nov. 15, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 462,563

Claims priority, application Japan, Mar. 16, 1989, 1-064264; Mar. 18, 1989, 1-066793; Mar. 18, 1989, 1-066796; Mar. 18, 1989, 1-067242; Mar. 18, 1989, 1-067248

Int. Cl.[6] G03G *15/02*

U.S. Cl. 430—57 **14 Claims**

1. An electrostatic information recording and reproducing method, characterized in that a photosensitive member having photoconductive layer with electrode on its front is placed face-to-face to an electrostatic information recording medium made of liquid crystal polymer layer and furnished with an electrode on backside, that exposure is performed without heating or by heating the electrostatic information recording medium up to the liquid crystal phase range with voltage applied between two electrodes, that the electrostatic information recording medium is separated



and cooled in the case of heating after the exposure pattern is recorded along the orientation of liquid crystal polymer or the electrostatic information recording medium is heated and cooled down after it is separated following the image exposure to record the information, and that the exposure pattern thus recorded is reproduced through a polarization means.

5,587,265

TONER FOR DEVELOPING STATIC CHARGE IMAGES AND PROCESS FOR PREPARING THE SAME

Kazue Nakadera; Haruo Okutani, and Hideki Kurebayashi, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 463,502

Claims priority, application Japan, Jun. 3, 1994, 6-145290; Jun. 3, 1994, 6-145291

Int. Cl.[6] G03G *9/087*

U.S. Cl. 430—109 **10 Claims**

1. A toner for developing an electrostatic image comprising at least a colorant and a binder resin,

characterized in that the main component of the binder resin is a polyester resin, and the polyester resin is containing a polymer prepared by reacting a polyester oligomer and at least one compound selected from the group consisting of long chain alcohols and long chain carboxylic acids which have 12 or more carbon atoms wherein said polyester oligomer has a number average molecular weight (Mn) of 3000 or less and is prepared by polycondensing polyhydric alcohols with at least a component selected from the group consisting of aliphatic polycarboxylic acids having 11 or less carbon atoms, aliphatic dicarboxylic acids having 11 or less carbon atoms, anhydrides thereof, low alkyl esters thereof, aromatic polycarboxylic acids, aromatic dicarboxylic acids, anhydrides thereof, and low alkyl esters thereof.

5,587,266

MANUFACTURING METHOD FOR AN ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Junji Ujihara, and Akira Ohira, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 31, 1995, Ser. No. 521,975

Claims priority, application Japan, Sep. 6, 1994, 6-212675

Int. Cl.[6] G03G *5/04*

U.S. Cl. 430—133 **4 Claims**

1. A method of manufacturing an electrophotographic photoreceptor drum, the method comprising the steps of:

(a) aligning cylinder shafts of a plurality of cylindrical drums with each other, each drum having a chamfered face formed at an end thereof;

(b) contacting circular ends of the drums with each other and stacking the drums on each other; and

(c) continuously coating photoreceptor material on circumferential surfaces of the drums while inserting the drums into a ring-shaped coater and moving the ring-shaped coater vertically from an upper portion to a lower portion of the stacked drums,

wherein each of the drums satisfying the following inequalities at the same time is used:

$$30° \leqq \theta \leqq 80°, \text{ and } l \leqq 0.3 \text{ mm}$$

where θ represents an angle between an extension line of the chamfered face formed at an edge of the drum and an extension line of a circular end of the drum, and l represents a distance between an intersecting point of the circular end and the chamfered face of the drum, and an extension line of a circumferential surface of the drum.

5,587,267

METHOD OF FORMING PHOTORESIST FILM EXHIBITING UNIFORM REFLECTIVITY THROUGH ELECTROSTATIC DEPOSITION

Mario Garza, Sunnyvale, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 189,574, Jan. 31, 1994, which is a division of Ser. No. 907,757, Jun. 29, 1992, Pat. No. 5,330,883. This application Jun. 5, 1995, Ser. No. 461,118

Int. Cl.[6] G03C *1/52*

U.S. Cl. 430—168 **5 Claims**

5. A method of forming a photoresist film of uniform thickness over an underlying semiconductor substrate to thereby form a photoresist film of uniform reflectivity on said semiconductor substrate which comprises the steps of:

a) forming a powder of a photoresist material;

b) electrostatically charging said powder of photoresist material at one potential;

c) electrostatically charging a semiconductor substrate at an opposite potential; and

d) spraying a uniform thickness of said powder of photoresist material onto said semiconductor substrate;

to thereby form a photoresist film of uniform thickness on said semiconductor substrate which will therefore exhibit uniform reflectivity.

5,587,268

THERMAL TRANSFER IMAGING PROCESS

Geert Defieuw, Kessel-Lo; Wilhelmus Janssens, Aarschot, and Luc Vanmaele, Lochrist, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 8, 1995, Ser. No. 400,343

Claims priority, application European Pat. Off., Mar. 25, 1994, 94200796

Int. Cl.[6] G03C *8/00*

U.S. Cl. 430—200 **4 Claims**

1. A thermal imaging process for producing a high gradation image comprising the steps of;

a) bringing a donor layer of a donor element into face to face relationship with a receiving layer of a receiving element to form an assemblage,

b) image-wise heating the assemblage, thereby causing image-wise transfer of an amount of a thermotransferable reducing agent and a thermotransferable dye to said receiving element, the amount of said thermotransferred reducing agent being proportional to the amount of heat supplied,

c) separating said donor element from said receiving element, and

d) overall heating said receiving element, wherein

(i) said donor element comprises on a support, (a) a donor layer comprising a binder and a thermotransferable reducing agent which is capable of reducing a silver source to metallic silver upon heating and a thermotransferable dye, and (b) a heat resistant layer provided on the side of the support opposite to the side having said donor layer, and

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(ii) said receiving element comprises said receiving layer on a support, said receiving layer comprising a silver source which is capable of being reduced by heat in the presence of a reducing agent.

5,587,269

THERMAL TRANSFER IMAGING PROCESS AND DONOR ELEMENT FOR USE THEREIN

Geert Defieuw, Kessel-Lo, Belgium, assignor to Afga-Gevaert N.V., Mortsel, Belgium

Filed Mar. 8, 1995, Ser. No. 400,346

Claims priority, application European Pat. Off., Mar. 25, 1994, 94200788

Int. Cl.[6] G03C *8/40;8/44*

U.S. Cl. 430—203 **8 Claims**

1. A thermal imaging process comprising, in order, the steps of:

a) bringing a donor layer of a donor element into face to face relationship with a receiving layer of a receiving element to obtain an assemblage,

b) image-wise heating the assemblage, thereby causing image-wise transfer of an amount of a thermotransferable reducing agent to said receiving element in accordance with the amount of heat supplied by said thermal head,

c) separating said donor element from said receiving element, and

d) overall heating said receiving element, wherein

(i) said donor element comprises said donor layer on a support, wherein said donor layer comprises a binder, and thermotransferable reducing agent which is capable of reducing a silver source to metallic silver upon heating, and particles protruding from the surface of said donor layer, wherein

(ii) said receiving element comprises said receiving layer on a support, and said receiving layer comprises a silver source which is capable of being reduced by means of heat in the presence of a reducing agent.

5,587,270

THERMAL IMAGING PROCESS AND AN ASSEMBLAGE OF A DONOR AND RECEIVING ELEMENT FOR USE THEREIN

Wilhelmus Janssens, Aarschot; Jan Van den Bogaert, Schilde; Luc Vanmaele, Lochristi, and Geert Defieuw, Kessel-Lo, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 8, 1995, Ser. No. 400,349

Claims priority, application European Pat. Off., Mar. 10, 1994, 94200613.1

Int. Cl.[6] G03C *8/40;8/18*

U.S. Cl. 430—203 **6 Claims**

1. A thermal imaging process comprising, in order, the steps of:

a) bringing a donor layer of a donor element into face to face relationship with a receiving layer of a receiving element to obtain an assemblage,

b) imaging-wise heating the assemblage, thereby causing image-wise transfer of an amount of said thermally transferrable reducing agent from said donor layer to said receiving layer in accordance with an amount of heat supplied during the image-wise heating,

c) separating said donor element from said receiving element, and

d) overall heating said receiving element, wherein

(i) said donor element comprises said donor layer on a support, wherein said donor layer comprises a binder and said thermally transferrable reducing agent which is capable of reducing a silver source to metallic silver upon heating, and wherein an oxidized form of said reducing agent is colored or capable of forming a color, and

(ii) said receiving element comprises said receiving layer on a support, said receiving layer comprising a silver source which is capable of being reduced by means of heat in the presence of a reducing agent.

5,587,271

DAMPENING SOLUTION FOR PRINTING WITH A LITHOGRAPHIC PRINTING PLATE AND A METHOD FOR PRINTING THEREWITH

Franciscus Heugebaert, Mortsel, and Johan Van Hunsel, Berchem, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 2, 1995, Ser. No. 538,029

Claims priority, application European Pat. Off., Oct. 18, 1994, 94203008

Int. Cl.[6] G03C *8/06;* **G03F** *7/07*

U.S. Cl. 430—204 **5 Claims**

1. A method for lithographic printing comprising the following steps:

preparing a lithographic printing plate according to the silver salt diffusion transfer process by (1) image-wise exposing an imaging element comprising on a support a photosensitive layer comprising a silver halide emulsion and an image receiving layer containing physical development nuclei in water permeable relationship with said emulsion layer, (2) developing said imaging element in the presence of developing agent(s) and silver halide solvent(s) using an alkaline processing liquid and (3), if said emulsion layer is overlying said image receiving layer, removing the layers overlying said image receiving layer,

mounting said lithographic printing plate to a lithographic printing press, and

printing while supplying to said lithographic printing plate a dampening solution and a printing ink characterized in that the dampening solution as used on the printing plate contains less than 1.0 g/l of a transparent pigment of a non-water swellable inorganic fine particle with an average grain diameter of less than 0.1 μm and at least 0.35 g/l of a clay incorporating an inorganic polyphosphate peptiser.

5,587,272

PROCESS FOR PREPARING MULTIPLE COLOR PROOFS

Mario Grossa; Udo D. Bode, both of Dreieich; Manfred Sondergeld, Muhlheim/Main; Karl-Heinz Wiedenmann, Rodermark, all of Germany; Ronald J. Convers; Steven M. Kalo, both of Towanda, Pa., and Ashok K. Kudva, Hendersonville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1995, Ser. No. 569,043

Claims priority, application Germany, Dec. 27, 1994, 44 46 869.5

Int. Cl.[6] G03C *11/12;* **G03F** *7/28;7/42*

U.S. Cl. 430—257 **10 Claims**

1. A process for preparing images on multiple receptors comprising:

a) imagewise exposing a photopolymerizable layer to produce an exposed layer having tacky and nontacky areas thereon;

b) bringing the exposed layer into contact with a pigmented transfer layer on a support, wherein the exposed layer is adjacent the pigmented transfer layer;

c) peeling off the support, whereby the pigmented transfer layer is transferred onto the tacky areas of the exposed layer and is removed from the nontacky areas of the exposed layer to form a toned layer;

d) bringing the toned layer into contact with a temporary support;

e) removing the temporary support, whereupon the pigmented transfer layer adhering to the tacky areas of the photopolymerizable layer is transferred onto the temporary support;

f) bringing the temporary support, having thereon the pigmented transfer layer, into contact with an image receptor;

g) removing the temporary support, whereupon the pigmented transfer layer adhering to the temporary support is transferred onto the image receptor; and

h) repeating steps b) through g) at least once, whereby, in each instance, a new pigmented transfer layer, a new temporary support, and a new image receptor are used to form an image on the image receptors.

5,587,273

MOLECULARLY IMPRINTED MATERIALS, METHOD FOR THEIR PREPARATION AND DEVICES EMPLOYING SUCH MATERIALS

Mingdi Yan; John F. W. Keana; Martin N. Wybourne, all of Eugene, Oreg., and Christophe J. P. Sevrain, Ridgefield, Wash., assignors to Advanced Microbotics Corporation, Portland, and State of Oregon Acting by and through the State Board of Higher Education on Behalf of the University of Oregon, Eugene, both of Oreg.

Continuation-in-part of Ser. No. 267,851, Jun. 23, 1994, which is a continuation of Ser. No. 6,453, Jan. 21, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,918

Int. Cl.[6] G03C *5/00*

U.S. Cl. 430—269 **47 Claims**

1. A method for molecularly imprinting a material, comprising:

forming a solution comprising a solvent and (a) a polymeric material capable of undergoing an addition reaction with a nitrene, (b) a crosslinking agent, (c) a functionalizing monomer, and (d) an imprinting molecule;

evaporating the solvent to leave a residue;

exposing the residue to an energy source, thereby forming a crosslinked polymeric substrate; and

extracting the imprinting molecule from the crosslinked polymeric substrate.

5,587,274

RESIST COMPOSITION

Takahito Kishida, Yao; Akira Matsumura, Hirakata, and Atsushi Kawakami, Suita, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

Continuation-in-part of Ser. No. 77,377, Jun. 17, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 350,733

Claims priority, application Japan, Jun. 19, 1992, 4-160840

Int. Cl.[6] G03C *1/73*

U.S. Cl. 430—270.1 **5 Claims**

1. A positive type resist composition which comprises:

(a) a polymer having an acid value of 2 to 200, prepared from 20 to 94% by weight of a t-butyl ester of an α,β-ethylenically unsaturated carboxylic acid, 5 to 79% by weight of a (meth)-acrylate of the formula:

$$CH_2{=}C(R_1){-}COO{-}(R_2{-}O)_n{-}R_3 \qquad 1$$

wherein R_1 is hydrogen or a methyl group, R_2 represents

$$-\underset{R_5}{\overset{R_4}{C}}-R_6-$$

wherein R_4 represents hydrogen or an alkyl group, R_5 represents hydrogen or an alkyl group, R_6 represents a branched or straight chain alkylene group, provided that a total carbon number of R_4, R_5 and R_6 is 1 to 5, R_3 is an alkyl group having 1 to 6 carbon atoms, an aryl group or an aralkyl group and n is an integer of 1 to 10 and 1 to 75% by weight of another α,β-ethylenically unsaturated compound other than the above two mentioned monomers; and

(b) a photoactivator which generates an acid in response to a light irradiation.

5,587,275

PHOTOSENSITIVE RESIN COMPOSITION AND A PROCESS FOR FORMING A PATTERNED POLYIMIDE FILM USING THE SAME

Hideto Kato, Matsuida, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

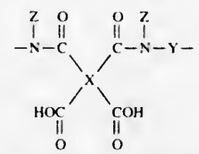
Filed Jul. 5, 1995, Ser. No. 498,225

Int. Cl.[6] G03F *7/038*

U.S. Cl. 430—283.1 **11 Claims**

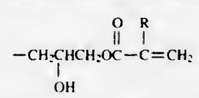
1. A photosensitive resin composition comprising:

(A) a polyimide precursor comprised of a structural unit represented by the following general formula (1):



(1)

wherein X is a tetravalent organic group having an aromatic ring, Y is a divalent organic group having an aromatic ring or a divalent organic group having a siloxane bond, and the two Z are each a hydrogen atom or a monovalent organic group having an acryloxy group or a methacryloxy group represented by the following general formula (2):



(2)

wherein R is a hydrogen atom or a methyl group, provided that the content of the monovalent organic group represented by said general formula (2) is at least 30 mole % of the total z contained in the polyimide precursor; and

(B) a member selected from the group consisting of a sensitizer, a photopolymerization initiator and a combination thereof.

5,587,276

IMAGE FORMATION METHOD

Kazunobu Katoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1996, Ser. No. 590,195

Claims priority, application Japan, Jan. 23, 1995, 7-008094

Int. Cl.[6] G03C *5/29*

U.S. Cl. 430—440 **3 Claims**

1. A method for forming a silver halide photographic image comprising developing a silver halide photographic material with a developing solution containing an ascorbic acid developing agent, substantially free from hydroquinone and having a pH of 8.5 to 11.0, said silver halide photographic material comprising a support which comprises a syndiotactic styrenic polymer and a silver halide emulsion layer provided on at least one surface of the support, said silver halide emulsion layer or another hydrophilic colloidal layer containing a hydrazine derivative, and the total amount of gelatin on the surface on which said silver halide emulsion layer is provided being 2.5 g/m^2 or less.

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5,587,277

SOLID PROCESSING COMPOSITION FOR SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL AND METHOD OF PROCESSING BY THE USE THEREOF

Hiroshi Yamashita, and Yutaka Ueda, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 294,580, Aug. 23, 1994. This application Jul. 11, 1995, Ser. No. 500,644
Claims priority, application Japan, Aug. 25, 1993, 5-210651
Int. Cl.[6] G03C *5/29*
U.S. Cl. 430—458 7 Claims

1. A solid photographic processing composition in tablet form for a silver halide photographic light sensitive material comprising a developing agent, bleaching agent, fixing agent or imaging stabilizing agent, wherein said solid composition has a bulk density of 1.0 to 2.5 g/cm^3, and substantially the whole of the surface of said solid processing composition is covered with a layer containing a compound in an amount of 0.5 to 5% by weight based on the total weight of the composition, said compound being

a polyalkylene glycol having an average molecular weight of 2000 to 20000, and

wherein said solid processing composition in tablet form has a weight of 0.5 to 50 g per a tablet.

5,587,278

POLYESTER PHOTOGRAPHIC SUPPORT

Fumio Kawamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1993, Ser. No. 164,962
Claims priority, application Japan, Dec. 11, 1992, 4-331928
Int. Cl.[6] G03C *1/795*
U.S. Cl. 430—533 11 Claims

1. A polyester support prepared by the step of

(1) subjecting a polyester film to bulk rolling and heating the bulk rolled polyester film to a temperature of from 50° C. to the glass transition point of the polyester film for 0.1 to 1500 hours, or

(2) subjecting a polyester film to bulk rolling at a temperature from 50° C. to the glass transition point of the polyester film for 0.1 to 1500 hours,

resulting in the polyester support,

wherein the polyester film comprises a polyester obtained by condensation polymerization of a diol and at least naphthalene dicarboxylic acid or an ester derivative thereof,

wherein the glass transition point of the polyester film is 90° to 200° C., and

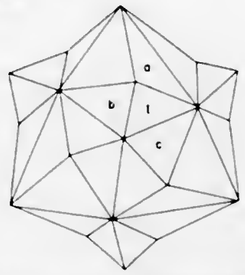
wherein the step of bulk rolling has a start tension of 3 to 75 kg/m per unit width of the polyester film and an end tension of 3 to 75 kg/m per unit width of the polyester film.

5,587,279

SILVER HALIDE EMULSION AND METHOD OF PREPARING THE SAME

Hiroyuki Mifune; Junichi Yamanouchi, and Shoji Ishiguro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 14, 1991, Ser. No. 791,402
Claims priority, application Japan, Nov. 14, 1990, 2-308062; Nov. 29, 1990, 2-331419
Int. Cl.[6] G03C *1/035*
U.S. Cl. 430—567 7 Claims



1. A silver halide photographic emulsion consisting essentially of silver halide grains which have a silver chloride content of at least 60 mol % and an octatetracontahedral crystal form constructed of 48 triangular faces, every one of which contacts convexly with each of two of its adjoining faces to form a line and concavely with the one remaining adjoining face to form a line.

5,587,280

LIGHT-SENSITIVE SILVER HALIDE EMULSION AND PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL USING THE SAME

Hideo Ikeda; Sadanobu Shuto, and Takefumi Hara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 195,438, Feb. 14, 1994, abandoned. This application May 19, 1995, Ser. No. 444,677
Claims priority, application Japan, Feb. 12, 1993, 5-046162
Int. Cl.[6] G03C *1/035*
U.S. Cl. 430—567 9 Claims

1. A light-sensitive silver iodobromide emulsion comprising tabular silver iodobromide grains having twin planes, where the number of said twin planes is two, said grains having an equivalent-circle diameter/thickness ratio of 8 to 100, wherein a variation coefficient of a grain size distribution of said tabular silver iodobromide grains is 1% to 20%, and not less than 50% by number of all of said tabular silver iodobromide grains are grains whose ratio, b/a, of a distance, a, between said two twin planes of said tabular silver iodobromide grain to a grain thickness, b, is $1.5 \leqq b/a < 5$.

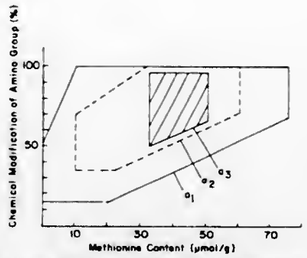
5,587,281

METHOD FOR PRODUCING SILVER HALIDE GRAIN AND SILVER HALIDE EMULSION USING THE GRAIN

Mitsuo Saitou; Junichi Yamanouchi, and Yoichi Hosoya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1995, Ser. No. 501,959
Claims priority, application Japan, Jul. 14, 1994, 6-184128
Int. Cl.[6] G03C *1/047;1/043;1/035*
U.S. Cl. 430—567 9 Claims

1. A method for producing silver halide grains containing tabular grains having a thickness of from 0.02 to 0.3 μm and an aspect ratio (diameter/thickness) of from 2 to 50 at a proportion of from 75 to 100% of the total projected area of silver halide grains, which



comprises at least nucleation, ripening and growing steps in a dispersion medium solution consisting of water and a dispersion medium, wherein gelatin having the following characteristics (a) occupies from 30 to 100 wt % of said dispersion medium used in said growing step:

characteristics (a)

the relation between the number percentage of a chemically modified —NH_2 group selected from a secondary amino group, a tertiary amino group, and a deaminated product in said gelatin and the methionine content of said gelatin is in the region a_1 depicted in FIG. 1.

5,587,282

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Haruyasu Nakatsugawa; Masakazu Yoneyama, and Shigeharu Urabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 19, 1995, Ser. No. 504,348
Claims priority, application Japan, Jul. 28, 1994, 6-177183
Int. Cl.[6] G03C *1/043*
U.S. Cl. 430—637 3 Claims

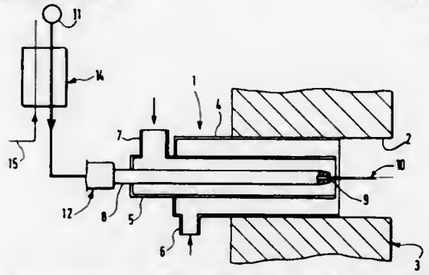
1. A silver halide photographic material comprising a support having thereof at least one light-sensitive silver halide emulsion layer, wherein the silver halide emulsion is produce in the presence of a polyalkylene oxide group-containing organopolysiloxane, wherein the polyalkylene oxide group has at least four repeating units.

5,587,283

COMBUSTION PROCESS

Pierre Karinthi, Jouy en Josas; Marc Buffenoir, Voisins le Bretonneux, both of France, and Dominique Belot, Tokyo, Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et L'Exploitation des Procedes Georges Claude, Paris Cedex, France

Filed Sep. 9, 1994, Ser. No. 303,505
Claims priority, application France, Sep. 9, 1993, 93 10703
Int. Cl.[6] F23C *7/00*
U.S. Cl. 431—10 8 Claims



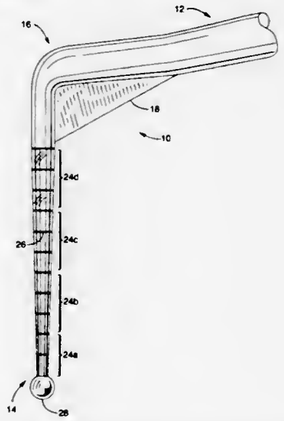
1. In a combustion process comprising the steps of injecting, via a burner (1), at least one combustible gas flow and at least one flow of oxygenated combustion supporting gas; the improvement wherein the combustion supporting gas is oxygen which is injected in liquid and gaseous phases.

5,587,284

PERIODONTAL PROBE TIP AND METHOD FOR USING

Steven J. Brattesani, 3051 Laguna St., San Francisco, Calif. 94123

Division of Ser. No. 148,159, Nov. 4, 1993, Pat. No. 5,423,677. This application May 11, 1995, Ser. No. 438,685
Int. Cl.[6] A61C *19/04;1/00;3/00;5/00*
U.S. Cl. 433—72 15 Claims



1. A dental probe tip for diagnosing periodontal disease, comprising:

(a) attachment means for coupling to a source of light;

(b) probing means, joined to said attachment means, for being illuminated by said source of light and for determining the depth of a periodontal pocket;

(c) said probing means including color indicator means for being illuminated by said source of light and for providing a relative indication of degree of periodontal disease;

(d) said probing means including an illuminating probing ball; and

(e) said color indicator means including a plurality of colored bands separated by translucent graduations into measured increments of predetermined length.

5,587,285

GENERATION SEROLOGICAL ASSAY FOR MONITORING HIV EXPOSURE

Miles W. Cloyd, Galveston, Tex., and Keith M. Ramsey, Mobile, Ala., assignors to University of Texas System, Austin, Tex.

Division of Ser. No. 829,352, Jan. 31, 1992, abandoned. This application Oct. 26, 1993, Ser. No. 143,168
Int. Cl.[6] C12Q *1/70;* G01N *33/574;33/567;33/564*
U.S. Cl. 435—5 13 Claims

1. An immunological method for detecting early human anti-HIV antibodies in a biological sample comprising the steps of:

preparing a target antigen with preserved configurational integrity of HIV envelope antigen that binds early anti-HIV antibody;

contacting a quantity of the target antigen with a biological sample to form a mixture;

incubating the mixture to facilitate binding between the target antigen and any early anti-HIV antibodies present in said biological sample specific for the target antigen to form a reaction mixture; and

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adding a labeled anti-HIV secondary antibody to label early antibody bound to the target antigen in the reaction mixture to produce labeled antibody target antigen complexes;

wherein the presence of labeled antibody-target antigen complexes provide an early indication of HIV exposure, and which biological sample is negative for early anti-HIV antibody to denatured HIV antigen by Western Blot or ELISA.

5,587,286

METHODS AND KITS FOR DETECTION OF CELLS IN FOOD MATERIALS

Edward E. Pahuski, Marshall; Randall L. Dimond, Madison, both of Wis.; John H. Priest, Everett, Wash.; Lisa Zandt, Madison, Wis.; Kathleen K. Stebnitz, Shorewood, Wis., and Leopoldo G. Mendoza, Madison, Wis., assignors to Promega Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 547,981, Jul. 2, 1990, abandoned. This application Jan. 11, 1993, Ser. No. 3,242

Int. Cl.[6] C12Q *1/02;1/24;1/68;* **C12N** *1/02*

U.S. Cl. 435—6 **24 Claims**

1. A method for detecting the presence of cells having nucleic acid that comprises a preselected target segment, in a culture or extract of a food material, said method comprising obtaining a pellet of cells from the culture or extract by combining an aliquot of the culture or extract with an aqueous suspension of a micro-particulate carrier to form a clearing solution and centrifuging the clearing solution to form a cell pellet, provided that, if said culture or extract of a food material is a culture and is a liquid milk sample, said clearing solution further comprises a chelating agent; suspending cells from the pellet so obtained in a first solution and treating the first solution to provide a second solution of nucleic acid from the cells for amplification without substantial isolation of nucleic acids of the cells from other constituents of the cells; subjecting the nucleic acid of the second solution to a nucleic acid amplification process to produce a pre-determined, amplified nucleic acid segment only if the pre-selected target segment is present in said cells suspended from said pellet; and assaying nucleic acid after the amplification process for the presence of said pre-determined, amplified segment.

5,587,287

THERMOSTABLE POLYMERASE SPECIFIC ANTIBODY-CONTAINING DNA AMPLIFICATION COMPOSITION AND KIT

Edward R. Scalice; David J. Sharkey, both of Rochester; Kenneth G. Christy, Jr., North Chili; Theodore W. Esders, Webster, and John L. Daiss, Rochester, all of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Division of Ser. No. 958,144, Oct. 7, 1992, Pat. No. 5,338,671. This application Apr. 7, 1994, Ser. No. 224,218

Int. Cl.[6] C12Q *1/68;1/70;* **C12P** *19/34;* **C07K** *16/40*

U.S. Cl. 435—6 **18 Claims**

1. A composition comprising a thermostable DNA polymerase, and a temperature sensitive inhibitor for said DNA polymerase,

said inhibitor being an antibody which is specific to said thermostable DNA polymerase and which inhibits said thermostable DNA polymerase at a temperature T_1 which is less than about 85° C. such that enzymatic activity of said thermostable DNA polymerase is inhibited, and

said inhibitor being irreversibly inactivated at a temperature T_2 which is greater than T_1 and is also greater than about 40° C., so that said thermostable DNA polymerase regains its enzymatic activity,

wherein said thermostable DNA polymerase is stable at T_2.

5,587,288

REGULATION OF EXOPROTEIN IN *STAPHYLOCOCCUS AUREUS*

Ambrose Cheung, New York, and Vincent A. Fischetti, West Hempstead, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed May 24, 1994, Ser. No. 248,505

Int. Cl.[6] C12Q *1/68;* **C07K** *13/00;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **3 Claims**

1. An isolated, purified *S. aureus* staphylococcal accessory regulatory (sar) protein, consisting of the amino acid sequence shown in SEQ ID NO. 1.

5,587,289

ISOLATED NUCLEIC ACID MOLECULES WHICH ARE MEMBERS OF THE MAGE-XP FAMILY AND USES THEREOF

Christophe Lurquin, and Thierry Boon-Falleur, both of Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Filed Mar. 14, 1995, Ser. No. 403,388

Int. Cl.[6] C12Q *1/68;* **C07H** *21/02;21/04;* **C12N** *15/70*

U.S. Cl. 435—6 **12 Claims**

1. Isolated nucleic acid molecule which encodes a MAGE-Xp tumor rejection antigen precursor or is complementary to an isolated nucleic acid molecule which encodes a MAGE-Xp tumor rejection antigen precursor, wherein said isolated nucleic acid molecule (i) is not SEQ ID NO: 1, and (ii) hybridizes to at least one isolated nucleic acid molecule consisting of SEQ ID NO: 2, SEQ ID NO: 3, and SEQ ID NO: 4, under stringent conditions.

9. Method for identifying human X chromosome in a sample comprising contacting said sample with the isolated nucleic acid molecule of claim 1 under condition favoring hybridization of said isolated nucleic acid molecule to said X chromosome, and determining hybridization as a determination of said human X chromosome.

5,587,290

STRESS TOLERANT YEAST MUTANTS

Daniel Klionsky, Davis, Calif.; Helmut Holzer, and Monika Destruelle, both of Freiburg, Germany, assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 26, 1995, Ser. No. 494,714

Int. Cl.[6] C12Q *1/68;* **C12N** *1/19;15/31*

U.S. Cl. 435—6 **9 Claims**

1. An isolated yeast mutant deficient in the expression of functional Ath1p gene product.

5,587,291

METHOD FOR THE DETERMINATION OF PLASMIN α2-ANTIPLASMIN COMPLEXES AND THE USE OF THIS METHOD AS A MEAN OF DETERMINING CHANGES IN THE FIBRINOLYTIC SYSTEM

Bernd Binder, Vienna, Austria, assignor to Berbi Gesellschaft m.b.H., Vienna, Austria

PCT No. PCT/AT93/00065, § 371 Date Dec. 10, 1993, § 102(e) Date Dec. 10, 1993, PCT Pub. No. WO93/21532, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 14, 1993, Ser. No. 157,210

Claims priority, application Austria, Apr. 14, 1992, 772/92

Int. Cl.[6] G01N *33/86;33/577;33/543*

U.S. Cl. 435—7.4 **5 Claims**

3. A process for the quantitative determination of a plasmin-alpha2-antiplasmin (PAP) complex in a sample of serum or plasma using a sandwich ELISA system, which comprises the steps of:

(a) obtaining the sample of serum or plasma containing the PAP complex;

(b) providing monoclonal antibody MPW7AP produced by a hybrid continuous cell line having ECACC deposit no. 94072834 as a capture antibody, said capture antibody being immobilized on a solid phase and binding to a neoantigen on the PAP complex, said monoclonal antibody MPW7AP characterized by a specific reaction exclusively with the PAP complex but not with the respective separate components in a Western blot analysis;

(c) capturing the PAP complex by contacting the sample of serum or plasma with said solid phase immobilized capture antibody;

(d) contacting the captured PAP complex with a predetermined amount of an enzyme-labelled detecting antibody which specifically binds to the kringle 1-3 region of the plasminogen part of the PAP complex;

(e) measuring the amount of enzyme label contained in the enzyme-labelled detecting antibody bound to the kringle 1-3 region of the plasminogen part of the captured PAP complex; and

(f) comparing the amount of bound label in step (e) with the amount of bound label from a standard with a known amount of said PAP complex, also measured according to steps (b) through (e) in order to quantitatively determine the amount of PAP complex in the sample of serum or plasma.

5,587,292

DIAGNOSIS OF FUNGAL INFECTIONS WITH A CHITINASE

Roger A. Laine, and Wai C. J. Lo, both of Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 288,969, Aug. 10, 1994, abandoned, which is a continuation of Ser. No. 171,184, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 827,722, Jan. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 620,909, Dec. 3, 1990, abandoned, which is a continuation of Ser. No. 53,029, May 22, 1987, abandoned. This application Mar. 9, 1995, Ser. No. 402,772

Int. Cl.[6] G01N *33/53;33/532;33/536;33/569*

U.S. Cl. 435—7.9 **36 Claims**

1. A method for detecting chitin in a sample comprising a human or animal tissue, or comprising a human or animal body fluid, said method comprising the steps of:

(a) contacting the sample with a substance comprising Chitinase VP1; and

(b) analyzing the sample for the presence of Chitinase VP1 bound to chitin.

5,587,293

METHOD TO IDENTIFY BINDING PARTNERS

Lawrence M. Kauvar, San Francisco, and Hugo O. Villar, Newark, both of Calif., assignors to Terrapin Technologies, Inc., South San Francisco, Calif.

Filed Jan. 6, 1994, Ser. No. 177,673

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.21 **9 Claims**

1. A method to determine a predicted reactivity of a candidate compound with a target receptor, which method comprises the steps of:

(a) providing a formula that represents a combination of the reactivity profiles of at least two members of a panel of reference receptors with respect to a first set of training compounds, which formula calculates a predicted profile that best matches the reactivity profile of the target receptor with respect to said first set of training compounds;

(b) determining the reactivity of said at least two members of the panel of reference receptors with a candidate compound to obtain a reactivity profile for said candidate compound with respect to said members of said panel; and

(c) calculating the predicted reactivity of the target receptor for said candidate compound by applying said formula of step (a) to the reactivity profile of the candidate compound determined in step (b) to predict the reactivity of the candidate compound with the target receptor.

5,587,294

METHOD AND KIT FOR MEASURING ENDOGENOUS CYTOKINES

Lawrence Tamarkin, Rockville, and Giulio F. Paciotti, Baltimore, both of Md., assignors to Assay Research, Inc., College Park, Md.

Continuation of Ser. No. 855,109, Mar. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 732,867, Jul. 19, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 331,333

Int. Cl.[6] G01N *33/543*

U.S. Cl. 435—7.93 **12 Claims**

1. A method of monitoring cytokine therapy in a human or animal, wherein the cytokine is able to bind a carrier molecule but is not IL-1, comprising the steps of

(1) obtaining a sample of body fluid from the human or animal without dissociation of the cytokine from bound carrier molecule, wherein the cytokine has been administered to the human or animal;

(2) combining the sample of body fluid with,

(a) an antibody capable of binding specifically to substantially all of the cytokine, whether free or bound to a carrier molecule, wherein the antibody is immobilized on a solid phase support, and

(b) a labeled binding epitope of the cytokine, wherein the labeled binding epitope competes with the cytokine for antibody binding, to form an assay mixture;

(3) incubating the assay mixture to allow the immobilized antibody to bind specifically to either the cytokine or the labeled binding epitope;

(4) washing away unbound labeled binding epitope from the solid phase support;

(5) detecting bound label on the solid phase support;

(6) determining the amount of substantially all of the cytokine in the sample; and

(7) comparing the amount of substantially all of the cytokine in the sample with a determination of substantially all of the cytokine in a previous sample of body fluid.

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5,587,295

METHOD FOR PRODUCING AFFINO-ENZYMATIC COMPOUNDS AND VISUALIZING AGENT AND APPLICATION THEREOF

Jury M. Lopukhin; Viktor V. Zvesky; Alexander B. Rabovsky, all of Moscow, and Irina P. Andrianova, deceased, late of Moscow, all of Russian Federation, assignors to 2860601 Canada Inc., Toronto, Canada

Division of Ser. No. 146,974, Dec. 9, 1993, Pat. No. 5,489,510, which is a continuation-in-part of Ser. No. 54,954, Apr. 28, 1993, abandoned, which is a continuation of Ser. No. 296,448, Jan. 11, 1989, abandoned. This application Jul. 19, 1994, Ser. No. 276,914

Claims priority, application U.S.S.R., Jan. 19, 1988, 4357046

Int. Cl.[6] C12Q *1/60;* **G01N** *31/00*

U.S. Cl. 435—11 **8 Claims**

1. An affino-enzymatic agent which comprises a binding agent A which binds with cholesterol in the surface of the skin and a visualizing agent B which is bound to the binding agent A to permit color detection of the affino-enzymatic agent.

5,587,296

REAGENT FOR ASSAYING GLUCOSE

Hiroyuki Tsubota, and Reiko Shimada, both of Tokyo, Japan, assignors to Iatron Laboratories, Inc., Tokyo, Japan

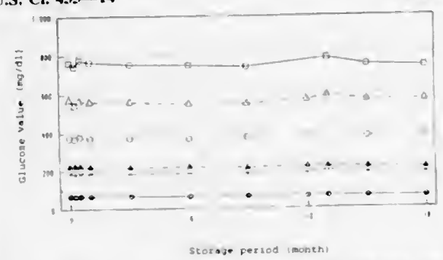
PCT No. PCT/JP94/01395, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO95/06136, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 24, 1994, Ser. No. 424,284

Claims priority, application Japan, Aug. 25, 1993, 5-232371

Int. Cl.[6] C12Q *1/54;1/50;1/32;* **G01N** *33/48*

U.S. Cl. 435—14 **8 Claims**



1. A reagent for assaying glucose in a sample consisting essentially of:

(A) a first reagent containing (i) at least one of glucokinase or hexokinase, (ii) glucose 6-phosphate dehydrogenase and (iii) adenosine 5'-triphosphate, and

(B) a second reagent containing an oxidized form of nicotinamide adenine dinucleotide phosphate,

wherein said first reagent has a pH of 7.5 to 9.5, said second reagent has a pH of 3 to 5, and both the first reagent and the second reagent are liquids.

5,587,297

METHOD FOR IDENTIFICATION OF DISEASE-SPECIFIC SURFACE COMPONENTS OF VASCULAR ENDOTHELIAL CELLS

Bruce S. Jacobson, Amherst, and Jan E. Schnitzer, Boston, both of Mass., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 928,912, Aug. 11, 1992, Pat. No. 5,281,700. This application Jan. 24, 1994, Ser. No. 185,433

Int. Cl.[6] C12Q *1/02;* **G01N** *33/48;* **C07K** *1/18;1/30*

U.S. Cl. 435—29 **16 Claims**

1. A method for the identification of molecular components that are specific to tumor-associated vascular endothelium and are not also present in rapidly proliferating non-tumor-associated vascular endothelium, the method comprising the following steps:

(a) isolating plasma membrane fractions from (i) tumor-associated vascular endothelium, (ii) non-proliferating, non-tumor-associated vascular endothelium, and (iii) rapidly proliferating, non-tumor-associated vascular endothelium, which fractions are substantially enriched in endothelial cell membrane constituents containing said components and substantially depleted of non-membrane endothelial cell constituents;

(b) purifying said components from said membrane fractions;

(c) resolving individual components on the basis of differences in at least one of molecular mass, charge, and hydrophobicity to generate a components profile;

(d) comparing the profiles of plasma membrane fractions derived from (i)–(iii);

(e) identifying resolved molecular components present in (i) and absent from both (ii) and (iii).

5,587,298

BIOREACTOR

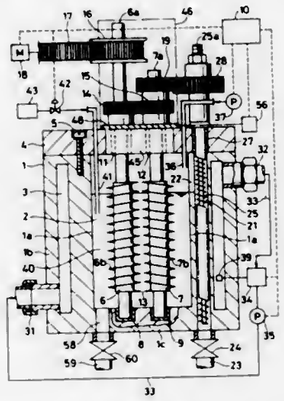
Akira Horigane; Ushio Matsukura, both of Tsukuba, and Masayoshi Kamio, Tsuchiura, all of Japan, assignors to Director General of National Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Ibaraki, Japan

Filed Mar. 24, 1995, Ser. No. 409,446

Claims priority, application Japan, Mar. 2, 1995, 7-043316

Int. Cl.[6] C12P *1/00;* **C12M** *1/02*

U.S. Cl. 435—41 **9 Claims**



1. A bioreactor for performing biological and biochemical reactions involving a substrate, a microorganism or a chemical substance, said bioreactor comprising:

a reaction vessel for carrying out a reaction therein;

a plurality of screws contained in said reaction vessel, said screws being provided in parallel relationship with a vertical axis of said reaction vessel and adjacent to an inner wall surface of the reaction vessel so that a vertical flow path for a reaction product is formed between the inner wall surface and the screws, each of said screws having a screw thread provided therearound with a threading sense opposite to that of an adjacent screw;

means for rotating adjacent screws in a direction opposite to each other so that a reaction mixture provided in said reaction vessel is pumped in a vertical direction and causes a mixing of the reaction mixture and a milling of particles contained in the reaction mixture by attrition between the particles and forms a sieving action by passing small particles into the vertical flow path through opposing surfaces of adjacent screws;

a temperature controlling device for maintaining the reaction vessel at a predetermined temperature;

means for supplying the reaction vessel with at least one substrate; and

means for removing the reaction product from the vertical flow path.

5. A method for performing biological and biochemical reactions involving a substrate, a microorganism or a chemical substance, said method comprising the steps of:

introducing at least one substrate into a reaction vessel of a bioreactor containing at least one member selected from the group consisting of one or more microorganisms and one or more chemical substances, said reaction vessel having a plurality of screws provided therein in a parallel relationship with a vertical axis of said reaction vessel and adjacent to an inner wall surface of the reaction vessel so that a vertical flow path for a reaction product is formed between the inner wall surface and the screws, each of said screws having a screw thread provided therearound with a threading sense opposite to that of an adjacent screw;

conducting at least one reaction in the bioreactor such that adjacent screws rotate in a direction opposite to each other so that a reaction mixture provided in said reaction vessel is pumped in a vertical direction and causes a mixing of the reaction mixture and a milling of particles contained in the reaction mixture by attrition between the particles and forms a sieving action by passing small particles into the vertical flow path through opposing surfaces of adjacent screws; and

removing the reaction product from the vertical flow path.

5,587,299

ISOLATED NUCLEIC ACID MOLECULE CODING FOR FIBROBLAST ACTIVATION PROTEIN ALPHA AND USES THEREOF

Wolfgang J. Rettig, Biberach, Germany; Matthew J. Scanlan, New York, N.Y.; Pilar Garin-Chesa, Biberach, Germany, and Lloyd J. Old, New York, N.Y., assignors to Memorial Sloan-Kettering Cancer Center, New York, N.Y.

Filed Apr. 20, 1994, Ser. No. 230,491

Int. Cl.[6] C12N *15/12;15/19*

U.S. Cl. 435—69.1 **15 Claims**

1. Isolated nucleic acid molecule which codes for mammalian FAPα having the amino acid sequence of SEQ ID NO: 2.

5,587,300

METHOD TO INCREASE REGULATORY MOLECULE PRODUCTION

James S. Malter, Madison, Wis., assignor to Wisconsin Ulumni Research Foundation, Madison, Wis.

Filed Apr. 26, 1994, Ser. No. 233,130

Int. Cl.[6] C12P *21/00;21/02;* **C12N** *15/00;15/06*

U.S. Cl. 435—69.1 **25 Claims**

1. A method to increase the production of a regulatory molecule in a population of transfected cells comprising:

(a) mutating a wild type cDNA sequence that encodes a first mRNA sequence for the regulatory molecule, wherein the mRNA includes a 3' untranslated region having a destabilizing element comprising an AUUUA sequence, to form a cDNA sequence that encodes a second mRNA sequence more stable than the first mRNA sequence, wherein the AUUUA sequence is replaced by AUGUA, AUAUA, GUGUG, AGGGA, GAGAG, or a combination thereof; and

(b) transfecting a cell population with the mutant cDNA sequence so that the production of the regulatory molecule by the cells is greater than the production of the regulatory molecule by a cell population with the wild type cDNA sequence.

5,587,301

DNA ENCODING A HYALURONAN RECEPTOR EXPRESSED IN HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS

Phillip R. Hawkins, Mountain View; Craig G. Wilde, Sunnyvale, and Jeffrey J. Seilhamer, Los Altos Hills, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Mar. 10, 1995, Ser. No. 402,217

Int. Cl.[6] C12N *5/10;15/12*

U.S. Cl. 435—69.1 **5 Claims**

1. An isolated DNA molecule comprising a nucleotide sequence encoding a human hyaluronan receptor (HR) having the amino acid sequence of SEQ ID NO: 2.

5,587,302

T CELL GROWTH FACTOR

Jacques Van Snick, Brussels; Catherine Uyttenhove, Chaumont-Gistoux, both of Belgium, and Richard J. Simpson, Melbourne, Australia, assignors to Ludwig Institute For Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 408,155, Sep. 15, 1989, Pat. No. 5,157,112, which is a continuation-in-part of Ser. No. 246,482, Sep. 19, 1988, Pat. No. 5,208,218. This application Jan. 8, 1990, Ser. No. 462,158

Int. Cl.[6] C12N *15/12;15/63*

U.S. Cl. 435—69.5 **20 Claims**

1. An isolated nucleic acid molecule which encodes murine T cell growth factor P40 which supports interleukin-2 and interleukin-4 independent growth of T cells.

5,587,303

PRODUCTION PROCESS OF L-AMINO ACIDS WITH BACTERIA

Akiko Wakamoto; Osamu Takahashi; Keizo Furuhashi, and Akira Miura, all of Toda, Japan, assignors to Nippon Mining Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 632,022, Dec. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 318,111, Mar. 2, 1989, abandoned. This application Jul. 20, 1994, Ser. No. 277,775

Claims priority, application Japan, Mar. 8, 1988, 63-052694; Mar. 8, 1988, 63-052695; Mar. 9, 1988, 63-055781; Jun. 14, 1990, 2-155661; Jul. 19, 1990, 2-191676; Jul. 19, 1990, 2-191677

Int. Cl.[6] C12P *13/08;13/06*

U.S. Cl. 435—116 **14 Claims**

1. A process for producing an optically active α-amino acid in L-configuration represented by formula (I'):

$$R-\underset{}{\overset{NH_2}{\overset{|}{CH}}}-COOH \qquad (I')$$

from the α-aminonitrile compound represented by formula (I):

$$R-\overset{NH_2}{\overset{|}{CH}}-CN \qquad (I)$$

wherein R is an isopropyl, butyl, or isobutyl group, which process comprises the steps of:

(a) contacting a microorganism having sterospecific nitrilase activity and selected from the group consisting of: Nocardiopsis sp. B96-47, FERM BP-2423; Nocardiopsis sp. A10-12, FERM BP-2422; Bacillus sp. B9-40, FERM BP-3992; and

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Bacillus sp. A9-1, FERM BP-3991 and the α-aminonitrile in a reaction medium of an ammoniacal buffer solution at a pH in the range of 8–12 to obtain the optically active α-amino acid in L-configuration; and

(b) recovering the optically active α-amino acid in L-configuration thus obtained from the reaction medium.

5,587,304

CLONING AND EXPRESSION OF THE GENE OF THE MALOLACTIC ENZYME OF *LACTOCOCCUS LACTIS*

Pierre Barre, Saint Gely du Fesc; Sylvie Dequin, and Virginie Ansanay, both of Montpellier, all of France, assignors to Institut National de la Recherche Agronomique - I.N.R.A., Paris Cedex, France

PCT No. PCT/FR94/00589, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO94/26879, PCT Pub. Date Nov. 24, 1994

PCT Filed May 18, 1994, Ser. No. 367,227

Claims priority, application France, May 18, 1993, 93 06003

Int. Cl.[6] C12P *7/50;* **C12N** *15/53;15/70;15/81*

U.S. Cl. 435—139 **15 Claims**

1. An isolated nucleic acid fragment, which comprises a sequence of 1620 bp encoding the malolactic enzyme of *Lactococcus lactis*.

5,587,305

***PASTEURELLA HAEMOLYTICA* TRANSFORMANTS**

Robert E. Briggs, Boone, and Fred M. Tatum, Ames, both of Iowa, assignors to The United States of America as represented by the Department of Agriculture, Washington, D.C., and Biotechnology Research and Development Corporation, Peoria, Ill.

Filed Dec. 6, 1993, Ser. No. 162,392

Int. Cl.[6] C12N *15/09;15/63*

U.S. Cl. 435—172.1 **16 Claims**

1. A method for producing a mutation in a particular region of DNA of a *P. haemolytica* genome comprising the steps of:

isolating said region of the genome from *P. haemolytica;*

introducing a mutation into said region to form a mutated DNA region;

methylating said mutated DNA region with a methylating enzyme which inhibits endonuclease cleavage at a recognition sequence selected from the group consisting of 5'-GATGC-3' and 5'-GCATC-3', to form methylated DNA;

introducing said methylated DNA into a *P. haemolytica* cell to form transformants; and

screening said transformants for those which have said mutation in said region on chromosomal DNA of said *P. haemolytica* cell.

5,587,306

PHOSPHOLIPASE C HOMOLOG

Phillip R. Hawkins, Mountain View, and Jeffrey J. Seilhamer, Los Altos Hills, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Apr. 10, 1995, Ser. No. 419,078

Int. Cl.[6] C12N *9/20;15/54;15/70*

U.S. Cl. 435—198 **5 Claims**

1. An isolated DNA molecule comprising a human phospholipase C homolog (plch) whose nucleotide sequence is shown in SEQUENCE ID NO. 1.

5,587,307

FEMA GENE OF *STAPHYLOCOCCUS EPIDERMIDIS*, FEMA PROTEIN, AND VECTORS AND MICROORGANISMS COMPRISING THE FEMA GENE

William E. Alborn, Jr., Carmel; JoAnn Hoskins, Indianapolis; Paul L. Skatrud, Greenwood, all of Ind., and Serhat Ünal, Ankara, Turkey, assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 208,925, Mar. 9, 1994, abandoned, which is a continuation of Ser. No. 57,163, Apr. 30, 1993, abandoned. This application Oct. 27, 1994, Ser. No. 330,154

Int. Cl.[6] C12N *15/31;15/70;* **C07K** *14/31*

U.S. Cl. 435—240.1 **5 Claims**

1. A DNA compound that comprises an isolated DNA sequence which is SEQ ID NO:1.

5,587,308

MODIFIED ADENO-ASSOCIATED VIRUS VECTOR CAPABLE OF EXPRESSION FROM A NOVEL PROMOTER

Barrie J. Carter, Kensington; Terence Flotte, Baltimore; Sandra Afione, Bethesda, and Rikki Solow, Gaithersburg, all of Md., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Filed Jun. 2, 1992, Ser. No. 891,962

Int. Cl.[6] C12N *5/10;15/86;* **C07H** *21/04*

U.S. Cl. 435—240.2 **10 Claims**

1. An adeno-associated viral vector in an adeno-associated virus particle comprising the inverted terminal repeat sequences of adeno-associated virus and a nucleic acid of a size within the adeno-associated virus packaging limit, wherein the inverted terminal repeat sequences promote expression of the nucleic acid, in the absence of another promoter functionally linked to the nucleic acid.

5,587,309

METHOD OF STIMULATING PROLIFERATION AND DIFFERENTIATION OF HUMAN FETAL PANCREATIC CELLS EX VIVO

Jeffrey Rubin, Rockville, Md.; Alberto Hayek, La Jolla, Calif.; Gillian M. Beattie, Poway, Calif., and Timo P. J. Otonkoski, La Jolla, Calif., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C., and Whittier Institute for Diabetes and Endocrinology, La Jolla, Calif.

Filed Apr. 29, 1994, Ser. No. 235,394

Int. Cl.[6] C12N *5/00;5/02*

U.S. Cl. 435—240.2 **6 Claims**

1. A method for inducing the ex vivo proliferation and differentiation of human fetal pancreatic β-islet cells, comprising the steps of:

(a) preparing a primary culture of human fetal pancreatic cells; and

(b) contacting said primary culture with an effective concentration of Hepatocyte Growth Factor/Scatter Factor, wherein said effective concentration is an amount sufficient to induce said primary culture to proliferate, to form insulin-producing islet-like cell clusters that upon grafting into a host animal develop into functional islet tissue, and to increase the proportion of β-epithelial cells in said clusters.

5,587,310

CHIMERIC BLOOD COAGULATION PROTEINS

William H. Kane, and Thomas L. Ortel, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Continuation of Ser. No. 975,839, Nov. 13, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,362

Int. Cl.[6] C07K *14/745;14/755;* **C12N** *5/10;15/12*

U.S. Cl. 435—240.2 **15 Claims**

1. A chimeric blood coagulation protein selected from the group consisting of:

coagulation factor V comprising a light chain in which from one to five A3 domain exons are replaced with the homologous exons of coagulation factor VIII; and

coagulation factor VIII comprising a light chain in which from one to five A3 domain exons are replaced with the homologous exons of coagulation factor V.

5,587,311

DNA ENCODING A CELL MEMBRANE GLYCOPROTEIN OF A TICK GUT

Gary S. Cobon, New South Wales, Australia; Joanna T. Moore, Umea, Sweden; Law A. Y. Johnston, Capalaba, Australia; Peter Willadsen, Chapel Hill, Australia; David H. Kemp, Upper Brookfield, Australia; Alagacone Sriskantha, Florey, Australia, and George A. Riding, Indooroopilly, Australia, assignors to Biotechnology Australia Pty. Ltd., Roseville, and Commonwealth Scientific and Industrial Research Organization, Campbell, both of Australia

Continuation of Ser. No. 62,109, May 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 926,368, Aug. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 242,196, Jul. 6, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 325,071

Claims priority, application Australia, Nov. 27, 1986, PH9196; Jun. 19, 1987, PH2570; Oct. 16, 1987, PH4912

Int. Cl.[6] C12N *1/00;1/15;1/21;5/10;15/12;15/63*

U.S. Cl. 435—240.2 **16 Claims**

1. An isolated and purified DNA molecule, free of homologous chromosomal DNA, comprising SEQ ID NO:55.

5,587,312

SOMATIC EMBRYOGENESIS METHOD

Gerrit J. van Holst, Enkhuizen; Marc Kreuger, Bovenkarspel; Wiert van der Meer, Enkhuizen; Erik Postma, Hoorn, and Rob Abbestee, Enkhuizen, all of Netherlands, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 180,253, Jan. 12, 1994, abandoned. This application Mar. 20, 1995, Ser. No. 406,822

Claims priority, application United Kingdom, Jan. 15, 1993, 9300705; Jan. 15, 1993, 9300706; Jan. 15, 1993, 9300707; Jan. 15, 1993, 9300729

Int. Cl.[6] C12N *5/00;5/02*

U.S. Cl. 435—240.46 **14 Claims**

1. A method of obtaining somatic embryos from non-callus material in suspension culture which comprises:

(i) culturing non-Daucus non-callus explant material in a liquid medium comprising an effective amount of auxin or mixture of auxins sufficient to promote the induction of pro-embryogenic mass (PEM) formation;

(ii) increasing the number of induced PEMs by cultivation of said PEMs in an auxin-containing liquid medium;

(iii) collecting PEMs obtained in step (ii) and placing them in an auxin-free liquid medium to induce somatic embryo formation;

(iv) inducing somatic embryo formation; and

(v) collecting somatic embryos resulting from the induced embryos of step (iv)

wherein the somatic embryos collected in step (v) have the same ploidy level as the non-callus starting material in suspension culture and said ploidy level is either diploid or tetraploid.

5,587,313

METHOD FOR FERMENTATION OF MARINE BACTERIA

Ronald M. Weiner, Adelphi, and David M. Manyak, Annapolis, both of Md., assignors to University of Maryland, College Park, Md.

Filed Mar. 10, 1995, Ser. No. 402,480

Int. Cl.[6] C12N *1/00;1/12;1/20*

U.S. Cl. 435—252.1 **9 Claims**

1. A medium suitable for the culture of marine bacteria comprising liver digest, salts, and a liquid solvent in amounts sufficient for the growth and maintenance of marine bacteria.

5,587,314

INTESTINE COLONIZING LACTOBACILLI

Stig Bengmark, Lund; Siv Ahrné, Bjärred; Göran Molin, and Bengt Jeppson, both of Lund, all of Sweden, assignors to Probi AB, Lund, Sweden

Continuation of Ser. No. 989,030, Apr. 16, 1993, Pat. No. 5,474,932. This application Apr. 6, 1995, Ser. No. 417,770

Claims priority, application Sweden, Jul. 25, 1991, 9102238

Int. Cl.[6] C12N *1/20*

U.S. Cl. 435—252.9 **7 Claims**

1. A biologically pure culture of a *Lactobacillus* strain having the ability to colonize human intestinal mucosa in vivo, and having all the identifying characteristics of *Lactobacillus plantarum* 299v.

5,587,315

Patent Not Issued For This Number

5,587,316

Patent Not Issued For This Number

5,587,317

CHEMICAL-BIOLOGICAL PROCESS FOR DEHALOGENATION OF HALOGENATED ORGANIC COMPOUNDS

James M. Odom, Avondale, Pa., assignor to E. I. Du Pont de Memours & Company, Wilmington, Del.

Continuation of Ser. No. 383,535, Feb. 2, 1995, abandoned, which is a continuation of Ser. No. 64,607, May 19, 1993, abandoned. This application Nov. 27, 1995, Ser. No. 562,944

Int. Cl.[6] C12P *5/02*

U.S. Cl. 435—262.5 **16 Claims**

1. A method for the dehalogenation of organohalogens from a sample containing organohalogens treated with a culture of sulfate reducing bacteria, a suitable reductant and a tetrapyrrole catalyst wherein the rate of dehalogenation in the treated sample is enhanced as compared with the untreated sample comprising the steps of:

(i) growing a culture of sulfate reducing bacterial cells in the presence of a suitable reductant useful for donating electrons to a tetrapyrrole catalyst, wherein said reductant is present in a molar excess as compared to said organohalogens;

(ii) contacting said cells with a media containing organohalogen compounds and a tetrapyrrole catalyst useful for catalyzing the dehalogenation of organohalogens, to form a reaction mixture; and

(iii) incubating said reaction mixture under suitable anaerobic conditions and for a time sufficient to dehalogenate said organohalogens.

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5,587,318

PROCESS FOR PREPARING(S)-α-METHYLARYLACETIC ACIDS

Charles I. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 879,538, May 4, 1992, Pat. No. 5,322,791, which is a continuation of Ser. No. 518,285, May 4, 1990, abandoned, which is a continuation of Ser. No. 942,149, Dec. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 840,280, Mar. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 811,260, Dec. 20, 1985, abandoned. This application Mar. 21, 1994, Ser. No. 215,285

Int. Cl.[6] C12P *7/40;7/54;* **C12N** *1/14*

U.S. Cl. 435—280 **12 Claims**

1. A process for preparing (S)-6-methoxy-α-methyl-2-naphthaleneacetic acid which comprises subjecting a substrate comprising a mixture of (R)- and (S)-6-methoxy-α-methyl-2-naphthaleneacetic acid esters, said esters selected from the group consisting of 2,2,2-trichloroethyl, cyanomethyl, 2-nitropropyl, 2-chloroethyl, methyl and 2-bromoethyl esters, to the hydrolytic enzymatic action of an extracellular microbial lipase isolated from *Candida cylindracea*, separating the unreacted (R)-6-methoxy-α-methyl-2-naphthaleneacetic acid ester, and recovering the (S)-6-methoxy-α-methyl-2-naphthaleneacetic acid.

5,587,319

PROCESS FOR THE PREPARATION OF L-PHOSPHINOTHRICIN USING TRANSAMINASES OF DIFFERENT SPECIFICITIES IN A LINKED PROCESS

Johann Then, Frankfurt am Main; Werner Aretz, Königstein, and Klaus Sauber, Bad Soden am Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 136,605, Oct. 15, 1993, abandoned, which is a continuation of Ser. No. 879,111, May 4, 1992, abandoned, which is a continuation of Ser. No. 448,814, Dec. 12, 1989, abandoned. This application Jul. 8, 1994, Ser. No. 272,286

Claims priority, application Germany, Dec. 14, 1988, 38 42 025.2

Int. Cl.[6] C12P *41/00;19/02*

U.S. Cl. 435—280 **11 Claims**

1. A two step process for the preparation of L-2-amino-4-methylphosphinobutyric acid, which comprises:

(a) reacting D,L-2-amino-4-methylphosphinobutyric acid with an α-keto acid, catalyzed by a D-aminoacid transaminase to produce 3-carboxy-3-oxo-propylmethylphosphinate, wherein said α-keto acid, is phenylglyoxylate, 4-hydroxyphenylglyoxylate or thiophenylglyoxylate, and

(b) reacting the 3-carboxy-3-oxo-propylmethylphosphinate with an amino-group donor wherein said amino-group donor is L-asparagine, L-aspartic acid, L-glutamic acid or glycine, catalyzed by an L-amino transaminase, wherein said D-aminoacid transaminase does not substantially react with the amino-group donor employed in step (b), and said L-aminoacid transaminase does not substantially react with the α-keto acid employed in step (a) to obtain a product:

(c) separating L-2-amino-4-methylphosphinobutyric acid from the product obtained in step (b).

5,587,320

SOLID ORGANIC WASTE PROCESSING APPARATUS

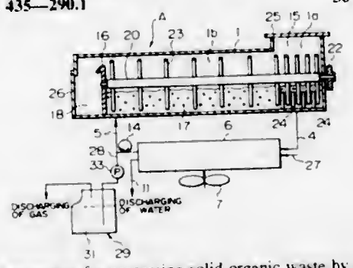
Yasuhiro Shindo, Tochigi-ken; Usaburo Yamaguti, Tochigi; Kazuo Ioka, Oyama; Toslo Suzuki, Tatebayashi; Akihiro Minagawa, and Syoichi Kitabatake, both of Tochigi-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1994, Ser. No. 292,204

Claims priority, application Japan, Nov. 1, 1993, 5-273395

Int. Cl.[6] C12M *3/00*

U.S. Cl. 435—290.1 **30 Claims**



1. An apparatus for processing solid organic waste by crushing and/or agitating and fermenting the waste, characterized by comprising:

a solid organic matter processing device including a processing vessel provided with a crushing unit for receiving and crushing the solid organic waste and a processing unit for agitating and fermenting the crushed waste;

a heat exchanger disposed outside said solid organic matter processing device which heat exchanger condenses vapor in a gas supplied from the processing vessel of said solid organic matter processing device to thereby change the vapor to liquid and to discharge the liquid; and

gas circulation means for providing a gas circulation path through which the inside of the processing vessel of said solid organic matter processing device is operably connected to said heat exchanger and through which a gas in the processing vessel of said solid organic matter processing device is supplied into said heat exchanger, almost all of the gas processed in said heat exchanger being returned to said solid organic matter processing device while a portion of the gas processed in said heat exchanger or a portion of the gas supplied from the processing vessel of said solid organic matter processing device is discharged to the outside of the apparatus.

5,587,321

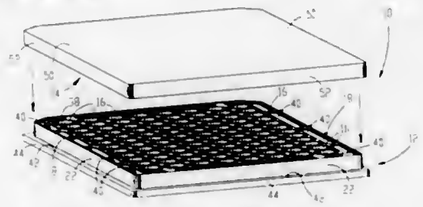
MOATED TISSUE CULTURE PLATE

Donald D. Smith, Blue Springs; Christopher B. Cohick, Kansas City, both of Mo., and Herbert B. Lindsley, Shawnee Mission, Kans., assignors to University of Kansas, Lawrence, Kans.

Filed Jul. 31, 1995, Ser. No. 509,174

Int. Cl.[6] C12M *3/00*

U.S. Cl. 435—305.3 **24 Claims**



1. A culture plate apparatus comprising:

structure defining a plurality of culture wells presenting respective top openings;

a frame supporting said wells; and

a cover configured for enclosing said top openings with a head space therebetween,

said frame including means defining a liquid-receiving chamber in spanning relationship with at least two of said wells, said frame having a chamber opening in communication with said head space, said frame being permanently secured to said structure defining said plurality of culture wells.

5,587,322

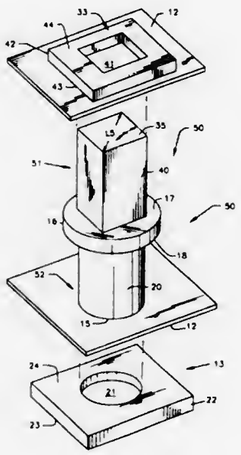
REPLICA PLATING DEVICE

Gary L. Chrebet, Princeton, N.J., assignor to ReplicaTech, Inc., Princeton, N.J.

Filed Nov. 23, 1994, Ser. No. 344,217

Int. Cl.[6] C12M *1/26;1/32*

U.S. Cl. 435—309.4 **11 Claims**



1. A device for replica plating having a sheet material capable of transferring cellular colonies from one medium to another medium, comprising:

a rigid support member having a first end and first region terminating at said first end coupled to a peripheral ridge, said rigid support member having a first rim disposed at a point of transition from said first region to said peripheral ridge, said first region having a substantially rectangular cross-sectional geometry with each side of said substantially rectangular cross-sectional geometry having a predetermined length defining the shape of said first end;

said rigid support member having a second end and second region terminating at said second end coupled to said peripheral ridge, said rigid support member having a second rim disposed at a point of transition from said second region to said peripheral ridge, said second region having a substantially circular cross-sectional geometry with a predetermined diameter defining the shape of said second end, said peripheral ridge having a geometric cross section which overlaps said first region creating said first rim and overlaps said second region creating said second rim; and,

a locking element defining an aperture through which said sheet of material and laid rigid support member pass, wherein said sheet of material is disposed between said locking element and said first rim and said sheet material is secured over said first end.

5,587,323

MECONIUM ASSAY PROCEDURE

Douglas E. Lewis, Oak Brook, and Christine M. Moore, Forest Park, both of Ill., assignors to United States Drug Testing Laboratories, Inc., Chicago, Ill.

Filed May 2, 1995, Ser. No. 433,232

Int. Cl.[6] G01N *1/18*

U.S. Cl. 436—178 **1 Claim**

1. A method for preparing a concentrated neonatal meconium extract containing substantially all of at least one target analyte present, if any, in a sample of infant meconium suspected of containing said at least one target analyte, said at least one target analyte being selected from the group consisting of amphetamine, opiate, cocaine metabolite, cannabinoids, PCP and mixtures of any of the foregoing, said concentrated meconium extract being specifically intended for use in subsequent qualitative and quantitative determinations of maternal use or exposure to said at least one target analyte during pregnancy and fetal exposure to said at least one target analyte, said method comprising:

(a) providing a test sample of newborn meconium suspected of containing said at least one target analyte;

(b) adding a substantially non-aqueous volatile mixture of acetonitrile and a volatile organic acid to said sample to form a first mixture;

(c) agitating the first mixture for a time sufficient to extract substantially all of said at least one target analyte from the meconium sample, without diluting the sample with water, until a substantially uniform liquid homogenate is obtained;

(d) centrifuging the liquid homogenate to form a two-phase mixture including an organic phase and a second phase;

(e) separating the organic phase from the second phase and diluting the organic phase with water to provide an aqueous organic solution suitable for solid-phase column separation;

(f) providing a mixed-mode, solid-phase extraction column having a strong cation exchange and hydrophobic functionality;

(g) separating said at least one target analyte present in the organic solution by adding the organic solution to the solid-phase extraction column in a manner permitting any said at least one target analyte present in the organic solution to become bound to the column;

(h) drying the column;

(i) collecting any bound neutral and acid analytes by eluting the column with a first solvent reagent including a mixture of a hydrocarbon and a carboxylic acid ester into a first container to provide an acid-neutral fraction;

(j) evaporating the acid-neutral fraction to dryness;

(k) collecting any bound basic analytes from the same column by eluting the column with a second solvent reagent including a polar organic solvent, an alkanol and a volatile base into a second container to provide a base fraction;

(l) combining the base fraction with the dried acid-neutral fraction to provide a combined fraction and evaporating the combined fraction to dryness;

(m) acidifying the dried combined fraction with 1% sulfuric acid to prevent amphetamine loss and evaporating to dryness; and

(n) thereafter, forming a concentrated neonatal meconium extract by reconstituting the acidified combined fraction with a protein-modified phosphate buffer at a pH of between about 5.0–8.5, suitable for use in subsequent qualitative and quantitative analytical procedures.

5,587,324

PROCESS FOR COAL TAR REMEDIATION

Timothy A. Roy, Princeton; Carl R. Mackerer, Pennington, both of N.J., and Lawrence Goldstein, Oakland, Calif., assignors to Mobil Oil Corporation, Fairfax, Va., and Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 15, 1994, Ser. No. 306,762

Int. Cl.[6] A62D *3/00*

U.S. Cl. 436—183 **2 Claims**

1. A method for determining the extent of remediation necessary to reduce the bioavailability of polynuclear aromatic compounds contained within a coal tar composition, comprising:

(a) obtaining a sample of a coal tar composition comprising coal tar;

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(b) experimentally determining a plurality of dermal flux rates for a corresponding plurality of ratios of petroleum coke to coal tar, wherein the weight ratios of petroleum coke to coal tar is from 1:1 to 10:1;

(c) calculating a dermally absorbed dose corresponding to each dermal flux rate by means of the equation:

$$DAD=DA\times EF\times ED\times A/(BW\times AT) \quad (1)$$

where:

DAD=dermally absorbed dose (mg PNA/kg body wt./day)

DA=dose absorbed per exposure (mg PNA/cm^2 body/day)

EF=exposure frequency (days/yr)

ED=exposure duration (yr)

A=exposure surface area (cm^2 body)

BW=body weight (kg)

AT=average time (days);

(d) subsequently calculating various corresponding cancer risks associated with the calculated dermally absorbed doses by using equation:

$$\text{Cancer risk}=1-e^{-DAD\times Q} \quad (2)$$

where

Cancer risk=probability of fatality due to exposure

Q=cancer slope factor; and

(e) using the calculated cancer risk to determine the weight ratio of petroleum coke to coal tar to adequately remediate the coal tar composition.

5,587,325

METHOD OF PREPARING ANTIMONY DOPED SEMICONDUCTOR WITH INTRINSIC GETTERING

Alain Comeau, Bromont, Canada, assignor to Mitel Corporation, Kanata, Canada

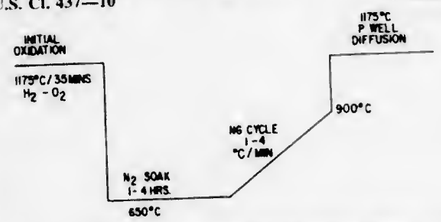
PCT No. PCT/CA93/00123, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/20582, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 26, 1993, Ser. No. 313,091

Claims priority, application Canada, Mar. 31, 1992, 2064486

Int. Cl.^{6} H01L *21/322*

U.S. Cl. 437—10 **5 Claims**



1. 1. A method of preparing a antimony-doped semiconductor wafer with intrinsic gettering capability, comprising consecutively carrying out the steps of:

a) exposing the antimony doped wafer to a wet oxidizing atmosphere at a steady temperature above about 1000° C. for between about 20 to 60 minutes to form an oxidation layer thereon;

b) immediately after step (a) heating said wafer at a steady temperature of between about 600°–700° C. in an inert atmosphere for about 1 to 4 hours to initiate formation of crystal nuclei in the wafer;

c) carrying out a single ramp cycle in said inert atmosphere during which the temperature is ramped up to a temperature of at least about 850° C. at a rate of about 1°–10° C./min. to initiate nucleation growth from said formed crystal nuclei; and

d) directly, without an intervening annealing step, carrying out a well diffusion step on the wafer at a temperature of at least about 1000° C. during which oxygen precipitation occurs.

5,587,326

METHOD OF FORMING BIPOLAR JUNCTION TRANSISTOR OF EPITAXIAL PLANAR TYPE

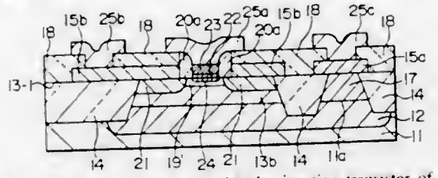
Hisashi Takemura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1992, Ser. No. 965,027

Claims priority, application Japan, Oct. 24, 1991, 3-277623

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—31 **9 Claims**



3. A fabrication method of a bipolar junction transistor of an epitaxial planar type, which comprises a collector region of a first conductivity type, a base region of a second conductivity type different from said first conductivity type, and an emitter region of the first conductivity type which is formed through a conductive film deposited on said emitter region and a poly-silicon layer deposited on said conductive film, said fabrication method comprising the steps of:

adding an additive in said conductive film which prevents occurrence of grain growth in the poly-silicon layer, said additive is selected from a group consisting of C, O and P;

depositing the conductive film including said additive, to a predetermined thickness not thicker than 100 Å; and

depositing the poly-silicon layer onto said conductive film.

5,587,327

PROCESS FOR PREPARING A HETEROJUNCTION BIPOLAR TRANSISTOR

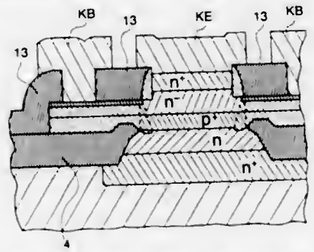
Ulf König; Andreas Gruhle, both of Ulm; Andreas Schüppen, Brackenheim; Horst Kibbel, Erbach; Harry Dietrich, Kirchhardt, and Heinz-Achim Hefner, Brackenheim, all of Germany, assignors to Daimler Benz AG, Stuttgart, and Temictelefunken Microelectronic GmbH, Heilbronn, both of Germany

Filed May 23, 1995, Ser. No. 447,947

Claims priority, application Germany, May 24, 1994, 44 17 916.2

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—31 **13 Claims**



1. A process for preparing a bipolar transistor, the process comprising the steps of:

providing a monocrystalline lead layer;

preparing a structured first layer with a collector zone and with insulation areas surrounding the collector zone, the structured first layer being prepared on the monocrystalline lead layer;

growing a series of monocrystalline transistor layers on the structured first layer over the collector zone by differential epitaxy and substantially at the same time, growing a series of polycrystalline layers over the insulation areas; and providing the polycrystalline layers as a base lead, said monocrystalline layers being grown as a series of layers of a heterobipolar transistor with a slightly doped emitter layer, one of said polycrystalline layers corresponding to said slightly doped emitter layer being employed as part of said base lead, one of said monocrystalline transistor layers forming a base layer;

transdoping said one of said polycrystalline layers corresponding to said slightly doped emitter layer into a conductivity type of said base layer, boundaries defined between said polycrystalline layers and said monocrystalline layers being included in said transdoping;

partially converting said one of said polycrystalline layers corresponding to said base layer into a silicide, said boundaries defined between said polycrystalline layers and said monocrystalline layers being also included in said silicide conversion;

etching free a portion of said series of polycrystalline layers around said series of monocrystalline layers to form an active emitter zone;

forming a ring of a material around said active emitter zone, shielding said active emitter zone from said transdoping along an exposed lateral boundary surface of said active emitter zone, said material of said ring also shielding said active emitter zone from said silicide conversion.

5,587,328

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

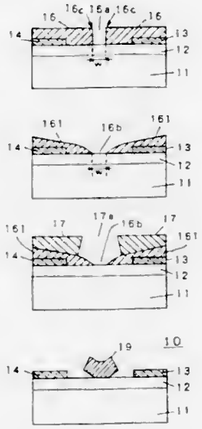
Kazuhiro Yoshida, Shiga-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 18, 1995, Ser. No. 572,876

Claims priority, application Japan, Dec. 20, 1994, 6-317019

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—40 **15 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

depositing a first mask layer on a semiconductor substrate;

forming an opening in the first mask layer;

causing the first mask layer to flow by heat-treating the semiconductor substrate;

depositing a second mask layer on the first mask layer;

forming in the second mask layer an opening larger than the opening in the first mask layer and exposing the opening in the first mask layer; and

depositing metal in the opening in the second mask layer, to form a first electrode on said semiconductor substrate.

5,587,329

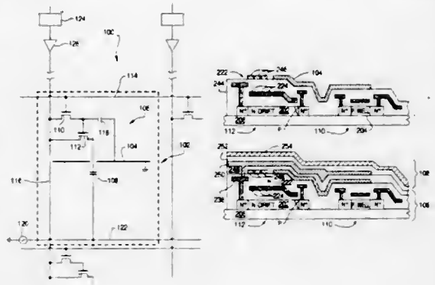
METHOD FOR FABRICATING A SWITCHING TRANSISTOR HAVING A CAPACITIVE NETWORK PROXIMATE A DRIFT REGION

Fu-Lung Hseuh, Middlesex; Alfred C. Ipri, Princeton, both of N.J.; Gary M. Dolny, Newtown, Pa., and Roger G. Stewart, Hillsborough Township, Somerset County, N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Aug. 24, 1994, Ser. No. 295,374

Int. Cl.^{6} H01L *21/786*

U.S. Cl. 437—40 **4 Claims**



4. A method of fabricating a pixel within an electroluminescent display comprising the steps of:

forming, upon a substrate, a drift region for a transistor;

forming a drain region and a source region for said transistor, where said drift region is located between said drain region and said source region;

forming a first insulating layer over said drift region;

depositing a gate electrode on said first insulating layer, said gate electrode partially overlapping said drift region;

depositing a first plurality of capacitive elements on said insulating layer, said elements overlapping a portion of said drift region not overlapped by said gate electrode;

forming a second insulating layer over said capacitive elements and said gate electrode;

depositing a second plurality of capacitive elements on said second insulating layer, said second plurality of elements partially overlaps said first plurality of capacitive elements;

forming, upon said second insulating slayer and overlapping said gate electrode, an electric field shield;

forming a third insulating layer over said second plurality of capacitive elements;

depositing a high voltage electrode of an electroluminescent cell on said third insulating layer such that, when a high voltage is applied to said high voltage electrode, a charge accumulates on said first and second plurality of capacity element and an electric field is uniformly distributed in said drift region; and

forming said electroluminescent cell upon said high voltage electrode.

5,587,330

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Oct. 18, 1995, Ser. No. 544,636

Claims priority, application Japan, Oct. 20, 1994, 6-281406

Int. Cl.^{6} H01L *21/8234*

U.S. Cl. 437—41 **30 Claims**

1. A method for producing a semiconductor device comprising the steps of:

forming a top gate type thin film transistor, wherein at least a portion of a channel forming region adjacent to a gate insulating film is a semiconductor; and

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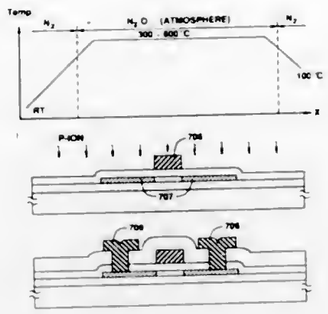


irradiating the top gate type thin film transistor with ultraviolet light having a wavelength of 350 nm or less in an atmosphere including a nitrogen oxide while heating treatment is performed at 300° C. or higher.

5,587,331

METHOD OF FORMING A CONTACT HOLE FOR A METAL LINE IN A SEMICONDUCTOR DEVICE

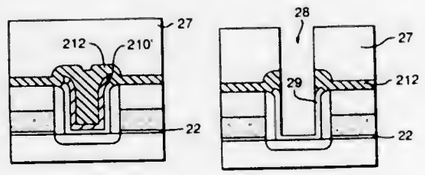
Young-Kwon Jun, 3-803 Garak-plaza, Apt. #199, Garak-dong, Songpa-gu, Seoul, Rep. of Korea

Filed Dec. 17, 1993, Ser. No. 168,247

Claims priority, application Rep. of Korea, Dec. 19, 1992, 1992-24804

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—41 **9 Claims**



1. A method for forming a contact hole to connect a metal line to a contact area on semiconductor substrate through said contact hole, the method comprising the steps of:

forming a first insulative layer on a surface of said semiconductor substrate;

forming a first contact hole in said first insulative layer to expose said contact area;

forming an insulative sidewall spacer on a sidewall surface of said contact hole;

depositing a barrier metal layer on said first insulative layer including said insulative sidewall spacer;

forming a barrier metal protective layer on said barrier metal layer, the barrier metal protective layer covering the contact area;

etching the barrier metal layer using the barrier metal protective layer as a mask;

forming a second insulative layer on said barrier metal protective layer and said first insulative layer; and

forming a second contact hole by removing at least portions of said second insulative layer and said barrier metal protective layer in correspondence with said first contact hole, thereby exposing said barrier metal layer in said contact area.

5,587,332

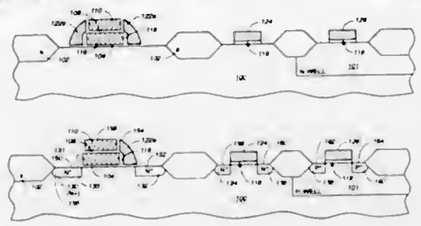
METHOD OF MAKING FLASH MEMORY CELL

Kuang-Yeh Chang, Los Gatos; Subhash R. Nariani, and William J. Boardman, both of San Jose, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 1, 1992, Ser. No. 938,727

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **43 Claims**



1. A method of manufacturing a multilayer polysilicon device including peripheral transistors, said method comprising the steps of:

forming a memory cell having at least two patterned polysilicon layers on a substrate, with one of said at least two patterned polysilicon layers being patterned subsequent to formation of remaining polysilicon layers used to form said memory cell and being patterned for preventing electron leakage of a gate of said memory cell during erasure; and

forming at least one peripheral transistor on said substrate, said at least one peripheral transistor having a gate, said step of forming at least one peripheral transistor further including forming said gate of said peripheral transistor with said one of said at least two patterned polysilicon layers for preventing electron leakage of said gate of said memory cell during erasure.

5,587,333

CAPACITOR IN AN INTEGRATED FUNCTION BLOCK OR AN INTEGRATED CIRCUIT HAVING HIGH CAPACITANCE, A METHOD FOR MANUFACTURING SAID CAPACITOR AND UTILIZING OF SAID CAPACITOR AS AN INTEGRATED DECOUPLING CAPACITOR

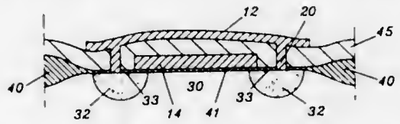
Ted Johansson, Hägersten, and Jose-Maria Gobbi, Stockholm, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Division of Ser. No. 84,459, Jul. 1, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,145

Claims priority, application Sweden, Jul. 6, 1992, 9202093

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—60 **20 Claims**



1. A method for construction of an integrated capacitor having a capacitance in an integrated function block or an integrated circuit, which utilizes unoccupied silicon surface underlying supply lines, ground connections or a bonding pad, and comprising the steps of:

applying a conductive layer on a thin layer of gate oxide on a p^-substrate, said conductive layer at the same time constituting a protective layer for the thin gate layer of said oxide and said conductive layer extending in a first direction, which extends beyond the underlying thin layer of said gate oxide, whereby at least one surface of the thin layer of said gate oxide is formed and delimited in a second direction opposite to said first direction by said conductive layer and by a thick layer of field oxide, and at least the one surface of the thin layer of said gate oxide is not protected by said conductive layer,

creating p^+doped islands in said p^-substrate by implanting in the surface of the thin layer of said gate oxide, which is not protected by said conductive layer,

forming an insulating layer over exposed surfaces of the thin layer of said gate oxide, said conductive layer and the thick layer of said field oxide,

forming a first plurality of interconnection openings for interconnection to said p^+doped islands and a second plurality of interconnection openings for interconnection to said conductive layer at ends of said conductive layer in said first direction, said second plurality of interconnection openings being placed in an area which does not have the thin layer of said gate oxide underneath, and

forming a plurality of metallization areas at a first metallization level, said metallization areas including a first metallization area, which is connected to said p^+doped islands through the first plurality of interconnection openings, and at least one second metallization area, which is connected to said conductive layer through said second plurality of interconnection openings,

whereby a capacitor structure of a capacitance is created, said capacitor structure decouples to a positive voltage source by additional connection to said first and second metallization areas at said first metallization level, wherein said first and second metallization areas each correspond to a respective capacitor connection, said capacitor structure being connected to portions of the function block or the integrated circuit by a second metallization level formed over said first metallization level.

5,587,334

SEMICONDUCTOR LASER DEVICE FABRICATION METHOD

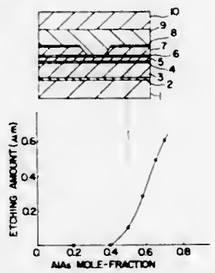
Hiroki Naito, Suita; Masahiro Kume, Ohtsu; Hideyuki Sugiura, Takatsuki; Toru Takayama, Nara; Kunio Itoh, Uji; Issei Ohta, Fujiidera, and Hirokazu Shimizu, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 40,655, Mar. 31, 1993, Pat. No. 5,386,429. This application Aug. 3, 1994, Ser. No. 285,357

Claims priority, application Japan, Mar. 31, 1992, 4-076710; Jun. 16, 1992, 4-156559; Sep. 24, 1992, 4-254537; Sep. 29, 1992, 4-259303; Oct. 19, 1992, 4-279907; Oct. 27, 1992, 4-288553; Dec. 11, 1992, 4-331498

Int. Cl.[6] H01L *21/20*

U.S. Cl. 437—129 **4 Claims**



1. A method of fabricating a semiconductor laser device comprising the steps of:

forming successively by an epitaxial growth method in at least one side of the principal plane of an active layer a certain conductive type $Ga_{1-Y1}Al_{Y1}As$ first light guide layer on said active layer, a $Ga_{1-Y2}Al_{Y2}As$ second light guide layer of said certain conduction type on said first light guide layer surface and an opposite conduction type $Ga_{1-Z}Al_{Z}As$ layer on said second light guide layer surface;

etching selectively said $Ga_{1-Z}Al_{Z}As$ layer to form a stripe-like configuration by using a mixed solution of hydrogen fluoride acid and an acid that will not by itself etch GaAlAs;

and

epitaxially growing a $Ga_{1-Y3}Al_{Y3}As$ layer of the same conduction type as said light guide layers on said stripe-like etched part,

where relations of Z>Y3>Y2 and Y1>Y2 are established among Y1, Y2, Y3 and Z that define the AlAs mole-fraction.

5,587,335

METHOD OF MAKING SURFACE EMISSION TYPE SEMICONDUCTOR LASER

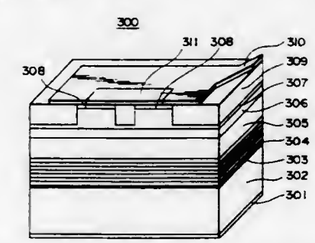
Katsumi Mori; Tatsuya Asaka; Hideaki Iwano, and Takayuki Kondo, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 319,650, Oct. 7, 1994, Pat. No. 5,537,666, which is a continuation-in-part of Ser. No. 999,137, Dec. 31, 1992, Pat. No. 5,356,832, which is a continuation-in-part of Ser. No. 756,981, Sep. 9, 1991, Pat. No. 5,182,757, and a continuation-in-part of Ser. No. 205,363, Mar. 3, 1994, Pat. No. 5,436,922, which is a continuation-in-part of Ser. No. 13,024, Feb. 2, 1993, Pat. No. 5,295,148, which is a continuation-in-part of Ser. No. 997,177, Dec. 28, 1992, Pat. No. 5,317,584, which is a continuation-in-part of Ser. No. 756,979, Sep. 9, 1991, Pat. No. 5,181,219, which is a continuation-in-part of Ser. No. 756,980, Sep. 9, 1991, Pat. No. 5,181,221, which is a continuation-in-part of Ser. No. 756,981, Sep. 9, 1991, Pat. No. 5,182,757. This application Jul. 12, 1995, Ser. No. 501,660

Claims priority, application Japan, Sep. 12, 1990, 2-242000

Int. Cl.[6] H01L *21/20*

U.S. Cl. 437—129 **26 Claims**



1. A method of making a surface emission type semiconductor laser which comprises a substrate and an optical resonator on said substrate, said optical resonator including a pair of reflection mirrors respectively located on the substrate and light exit sides thereof and a plurality of semiconductor layers formed between said reflection mirror pair, the light being emitted in a direction perpendicular to said substrate, said method comprising the steps of:

forming said reflection mirror located on the substrate side and said semiconductor layers in said optical resonator on said substrate through the organic metal vapor growth method or molecular-beam epitaxy growth method;

forming a photoresist mask on said semiconductor layers;

etching at least a cladding layer in said semiconductor layers by the use of said photoresist mask to form at least one column-like portion having sidewalls extending substantially perpendicular to said substrate and being operative to guide the light in a direction perpendicular to said substrate;

forming a buried layer around said column-like portion, said buried layer including a single layer at its region covering the sidewalls of said column-like portion; and

depositing a multilayered dielectric mirror in said column-like portion on the light exit side thereof to form said reflection mirror on the light exit side.

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5,587,336

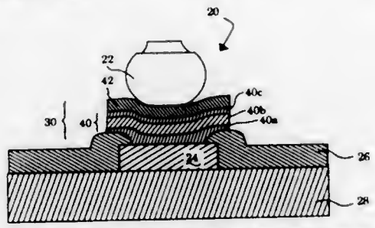
BUMP FORMATION ON YIELDED SEMICONDUCTOR DIES

Tsing-Chow Wang, San Jose; Serena M. Luo; Marlita F. Macaraeg, both of Milpitas; Francisca Tung, Los Gatos, and Thomas J. Massingill, Scotts Valley, all of Calif., assignors to VLSI Technology, San Jose, Calif.

Filed Dec. 9, 1994, Ser. No. 353,022

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—183 **3 Claims**



1. A method of forming an adhesion pad and ball bump structure on a surface of a semiconductor wafer, said method comprising:

(a) depositing a barrier material onto the surface of the wafer;

(b) depositing a bonding material onto the surface of the barrier material;

(c) coating the wafer with a photoresist material;

(d) processing the photoresist material to define an adhesion pad, including a barrier material and a bonding material, above a bond pad, and removing the photoresist material which does not define the adhesion pad;

(e) etching the material not protected by the photoresist;

(f) removing the photoresist material present after step (e) to expose the adhesion pad;

(g) testing the wafer to determine good dies; and

(h) forming a ball bump on the adhesion pad of good dies.

5,587,337

SEMICONDUCTOR PROCESS FOR FORMING BUMP ELECTRODES WITH TAPERED SIDEWALLS

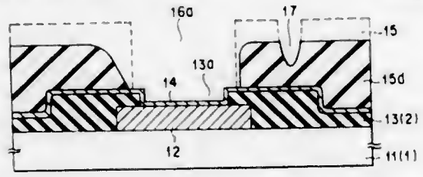
Toshiaki Idaka, Yokohama, and Hirokazu Ezawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 246,744, May 20, 1994, Pat. No. 5,473,197. This application May 19, 1995, Ser. No. 444,513

Claims priority, application Japan, May 28, 1993, 5-126582

Int. Cl.[6] H01L *21/441*

U.S. Cl. 437—183 **4 Claims**



1. A method for manufacturing semiconductor devices comprising the steps of:

forming a plurality of pad areas on a semiconductor substrate, forming a passivation film on said pad areas, and forming first openings in said passivation film in positions corresponding to said pad areas;

covering the entire surface of the resulting passivation film with an organic film;

forming second openings in said organic film in positions corresponding to said first openings and in communication with said respective first openings and forming groove portions in the surface of said organic film at least in positions between said second openings;

effecting a heat treatment to contract said organic film and enlarge the upper end portion of said second opening in a direction towards a portion in which said groove portion is not formed;

forming bump electrodes of metal connected to said pad areas in said first and second openings; and

removing said organic film.

5,587,338

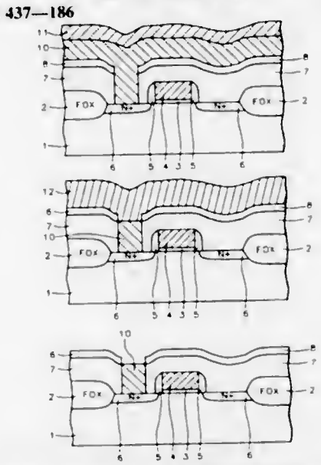
POLYSILICON CONTACT STUD PROCESS

Horng-Huei Tseng, Hsin Chu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Apr. 27, 1995, Ser. No. 428,493

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—186 **24 Claims**



1. A method for fabricating a MOSFET device on a semiconductor substrate, using a conductive stud to provide electrical contact between active device elements in the substrate, and an overlying interconnect metallization, comprising the steps of:

providing the active device elements in the said semiconductor substrate;

depositing a first dielectric layer on said semiconductor substrate, that includes said active device elements;

depositing a second dielectric layer on said first dielectric layer, to form composite dielectric layer;

photolithographic processing to open a region in a photoresist layer, exposing an area of said composite dielectric layer, directly overlying said active device element;

anisotropic removal of said composite dielectric layer, in said exposed region of said photoresist layer, to create contact hole opening to said active device element;

cleaning the surface of said active device element, in said contact hole opening;

depositing an insitu doped polysilicon layer on the surface of said active device element, in said contact hole opening, and on the surface of said second dielectric layer;

depositing a layer of titanium on said insitu doped polysilicon layer;

annealing to completely convert a portion of said insitu doped polysilicon layer to a titanium silicide layer, on the surface of said second dielectric layer, while converting only a top portion of said insitu doped polysilicon layer, in said contact hole opening, to titanium silicide;

removal of said titanium silicide from the surface of said second dielectric layer, and from the surface of said unconverted insitu doped polysilicon, in said contact hole; and

removal of said second dielectric layer from the surface of said first dielectric layer.

5,587,339

METHOD OF FORMING CONTACTS IN VIAS FORMED OVER INTERCONNECT LAYERS

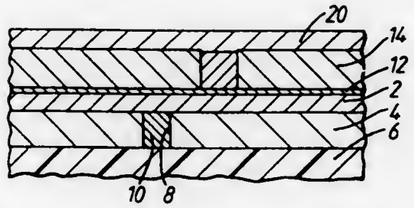
Graeme M. Wyborn, Walton-on-Thames, and Howard C. Nicholls, Penylan, both of United Kingdom, assignors to SGS-Thomson Microelectronics Ltd., United Kingdom

Continuation of Ser. No. 119,421, Sep. 10, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,954

Claims priority, application United Kingdom, Sep. 11, 1992, 9219267

Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—195 **22 Claims**



18. A method of fabricating a semiconductor device incorporating a via and a conductive interconnect layer, the method comprising the steps of:

(a) providing a silicon wafer structure;

(b) forming a conductive interconnect layer on the structure;

(c) forming a capping layer over the interconnect layer, the capping layer being selected from the group consisting of tungsten, titanium and titanium nitride;

(d) forming a dielectric layer on the capping layer; and

(e) selectively depositing a tungsten contact on the capping layer in a contact hole of the dielectric layer thereby to form a via, wherein the contact is deposited in a two stage deposition process in which in the first stage a tungsten containing species is introduced, in the absence of a reducing agent for such species, over the wafer structure, wherein the tungsten containing species reacts with the capping layer in the contact hole to deposit a tungsten seed layer on the capping layer, and in the second stage a reducing agent for that species is additionally introduced over the silicon wafer structure so as to reduce the tungsten containing species and deposit tungsten over the seed layer in the contact hole.

5,587,340

METHOD OF FORMING A SEMICONDUCTOR DEVICE IN A SUBSTRATE DEPRESSION

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Division of Ser. No. 168,360, Dec. 17, 1993, Pat. No. 5,464,780, which is a continuation of Ser. No. 735,057, Jul. 24, 1991, abandoned. This application Apr. 19, 1995, Ser. No. 424,194

Claims priority, application Japan, Jul. 25, 1990, 2-196869; Jul. 25, 1990, 2-196870

Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—203 **7 Claims**

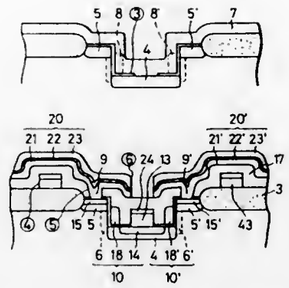
1. The method of forming a semiconductor device having at least an insulated gate field effect transistors comprising the steps of:

forming a depression in an upper surface of a semiconductor substrate, said depression having a bottom surface and at least one side surface;

forming a pair of impurity regions in an upper portions of the semiconductor substrate and the bottom surface of the depression;

forming a gate insulating layer on said side surface;

forming a conductive layer on said depression after forming said gate insulating layer; and



simultaneously forming a gate electrode adjacent to said side surface and a source or drain electrode contacting the impurity region formed within the bottom portion of said depression by selectively etching the formed conductive layer.

5,587,341

PROCESS FOR MANUFACTURING A STACKED INTEGRATED CIRCUIT PACKAGE

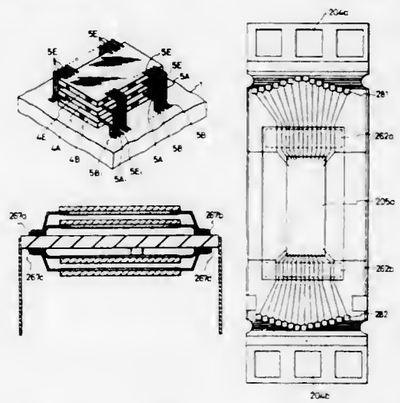
Watanabe Masayuki, Yokohama; Sugano Toshio, Kokubunji; Tsukui Seiichiro, Komoro; Ono Takashi, Akita, and Wakashima Yoshiaki, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo; Hitachi Tobu Semiconductor, Ltd., Inuma-gun, and Akita Electronics Co., Ltd., Minamiakita-gun, all of Japan

Continuation of Ser. No. 890,423, May 29, 1992, abandoned, which is a division of Ser. No. 796,873, Nov. 25, 1991, Pat. No. 5,138,438, which is a continuation of Ser. No. 607,411, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 209,739, Jun. 22, 1988, Pat. No. 4,982,265. This application Oct. 18, 1994, Ser. No. 323,709

Claims priority, application Japan, Jun. 24, 1987, 62-155478; Sep. 11, 1987, 62-226307

Int. Cl.[6] H01L *21/58;21/60;21/70*

U.S. Cl. 437—206 **17 Claims**



6. A method of fabricating a semiconductor memory module comprising the steps of:

providing a base plate having a first and a second face;

providing at least four semiconductor memory chips, each chip having at least one chip-select terminal and a plurality of corresponding non-chip-select terminals;

connecting a chip-select lead to said at least one chip-select terminal and corresponding leads to said plurality of corresponding terminals;

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stacking a first chip on top of a second chip, said first and second chips oriented such that corresponding terminals on said first chips are aligned with corresponding terminals on said second chip;

stacking a third chip on top of a fourth chip, said third and fourth chips oriented such that corresponding terminals on said third chips are aligned with corresponding terminals on said fourth chip;

superimposing and connecting only said corresponding leads on said first chip with corresponding leads on said second chip;

superimposing and connecting only said corresponding leads on said third chip with corresponding leads on said fourth chip;

mounting said stacked first and second chips onto the face of said base plate; and

mounting said stacked third and fourth chips onto the second face of said base plate.

5,587,342

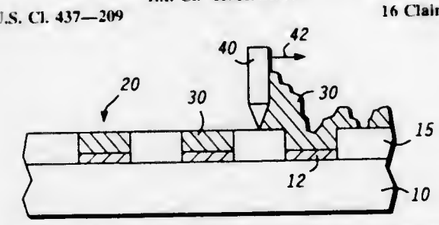
METHOD OF FORMING AN ELECTRICAL INTERCONNECT

Jong-Kai Lin; William H. Lytle, both of Chandler, and Ravichandran Subrahmanyan, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,972

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **16 Claims**



1. A method of forming an electrical interconnect, comprising the steps of:

providing a substrate;

forming a conductive layer on a portion of the substrate;

forming a wet photoresist layer on the substrate and the conductive layer;

patterning the wet photoresist layer to form openings to the conductive layer;

disposing a conductive paste in at least the openings to the conductive layer;

heating the conductive paste a first time at a temperature above room temperature;

removing the wet photoresist layer; and

heating the conductive paste at a temperature above room temperature a second time after the step of removing the wet photoresist layer.

5,587,343

SEMICONDUCTOR SENSOR METHOD

Kazuhiko Kano, Ohu; Yukihiro Takeuchi, Seto; Takamoto Watanabe, Nagoya; Kenichi Ao, Tokai; Masakazu Kanosue, Nagoya, and Hirofumi Uenoyama, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 8, 1995, Ser. No. 401,044

Claims priority, application Japan, Mar. 9, 1994, 6-038836; Feb. 20, 1995, 7-031163

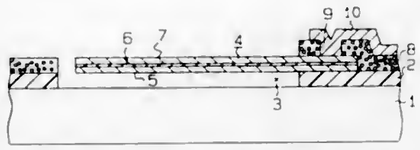
Int. Cl.[6] H01L *21/00;* **B44C** *1/22*

U.S. Cl. 437—228 **29 Claims**

1. A method for fabricating a semiconductor sensor, comprising the steps of:

forming a sacrificial layer on a semiconductor substrate;

forming a beam structure film on said semiconductor substrate by film deposition so as to sandwich said sacrificial layer



therebetween, wherein said beam structure film formation step includes a step of interrupting said film deposition at least one time; and

etching said sacrificial layer after said beam structure forming step so that said beam structure film assumes a movable state with respect to said semiconductor substrate.

5,587,344

METHOD FOR FABRICATING AN OXYNITRIDE FILM FOR USE IN A SEMICONDUCTOR DEVICE

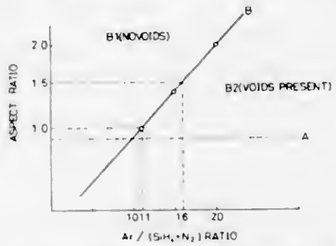
Hiraku Ishikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1995, Ser. No. 429,144

Claims priority, application Japan, Jun. 3, 1994, 6-121639

Int. Cl.[6] H01L *21/316;21/318*

U.S. Cl. 437—238 **2 Claims**



1. A method for fabricating a semiconductor device, said method comprising the steps of depositing a silicon oxynitride layer by means of plasma-enhanced chemical vapor deposition with a radio-frequency field being applied to a semiconductor substrate, said plasma-enhanced chemical vapor deposition using a silane gas, an argon gas, an oxygen gas and a nitrogen gas as process gases on condition that a flow rate ratio of said argon gas to said silane and nitrogen gases is in the range of 1.1 to 2.0 inclusive, and that a flow rate ratio of said nitrogen gas to said oxygen and nitrogen gases is in the range of 0.25 to 0.6 inclusive.

5,587,345

HIGH FLEXURAL STRENGTH CARBON FIBER REINFORCED SILICON CARBOXIDE COMPOSITE

Roger Y. Leung, Schaumburg, Ill., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 629,923, Dec. 19, 1990, Pat. No. 5,486,251, which is a continuation-in-part of Ser. No. 464,470, Jan. 12, 1990, Pat. No. 5,512,359, and a continuation-in-part of Ser. No. 523,620, May 15, 1990, Pat. No. 5,468,318. This application Jun. 5, 1995, Ser. No. 462,374

Int. Cl.[6] C03C *14/00*

U.S. Cl. 501—32 **10 Claims**

1. A carbon fiber-black glass composite consisting essentially of

(a) carbon reinforcing fibers having a high degree of graphitization resulting from treatment in an inert atmosphere above 1700° C.; and

(b) a black glass matrix having the empirical formula SiCxOy where x ranges from about 0.5 to about 2.0 and y ranges from about 0.5 to about 3.0.

5,587,346

TRANSLUCENT POLYCRYSTALLINE ALUMINA

Kariene J. Zuk, Hathorne, Mass., assignor to Osram Sylvania, Inc., Danvers, Mass.

Filed Jun. 16, 1995, Ser. No. 491,064

Int. Cl.[6] C04B *35/115*

U.S. Cl. 501—152 **5 Claims**

2. A sintered, translucent ceramic article comprising: a substantial amount of alpha alumina and an amount up to 0.050 wgt. percent magnesia and between 0.001 to 0.100 wgt. percent lutetium oxide.

5,587,347

RAW MATERIALS FOR PRODUCING COLOR CERAMIC PRODUCTS

Jibi Hong; Jianhua Chu, and Hongxiang Wu, all of Panzhihua, China, assignors to Panzhihua Iron and Steel (Group) Co., Panzhihua, China

Filed Mar. 27, 1995, Ser. No. 411,153

Claims priority, application China, Mar. 27, 1994, 94111695.6

Int. Cl.[6] C04B *35/453;33/14*

U.S. Cl. 501—155 **14 Claims**

1. A raw material for producing a colored ceramic product, comprising:

(1) a base material comprising 20–85% by weight of a V-bearing titanomagnetite tail obtained after ore dressing, wherein the total content of iron, titanium, cobalt and nickel of said tail is in the range of 3–45% by weight, based upon the weight of said base material, said iron, titanium, cobalt and nickel are present as titanomagnetite, ilmenite, titanaugite, plagioclase and/or sulfides; and trace amounts of vanadium in the form of insoluble spinel;

(2) 15–80% by weight, based upon the weight of said raw material, of at least two additives selected from the group consisting of red clay, white mud, and black mud; and

(3) 0–10% by weight, based upon the weight of said raw material, of a coloring agent.

5,587,348

ALKYNE HYDROGENATION CATALYST AND PROCESS

Scott H. Brown; Stan A. Zisman, and James B. Kimble, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1995, Ser. No. 424,733

Int. Cl.[6] B01J *27/06;27/13;27/128;23/44*

U.S. Cl. 502—230 **32 Claims**

1. A catalyst composition which comprises about 0.01–1 weight-% palladium, about 0.05–5 weight-% of at least one alkali metal, about 0.03–10 weight-% fluorine, and an inorganic support material selected from the group consisting of alumina, titania, zirconia and mixtures thereof, wherein the atomic ratio of fluorine to said at least one alkali metal is in the range of about 1.3:1 to about 4:1.

5,587,349

PROCESS FOR PREPARING SILICA-TITANIA CATALYST

Mariko Abe; Shuji Ebata; Takafumi Abe, and Hirofumi Higuchi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 30, 1994, Ser. No. 366,812

Claims priority, application Japan, Feb. 15, 1994, 6-018341

Int. Cl.[6] B01J *21/08*

U.S. Cl. 502—236 **16 Claims**

1. A process for preparing a silica-titania catalyst comprising adding an acidic solution containing a silicon compound and a titanium compound dissolved therein to a solution of a basic compound to bring about co-precipitation, in which the acidic solution is a nitric acid-acidic solution or a sulfuric acid-acidic solution; a ratio of the amount (gram equivalent) of nitric acid or sulfuric acid to the amount (mol) of the silicon compound in the acidic solution is 0.5 to 50; and the amount of the titanium compound in the acidic solution is such that a ratio of titania (TiO_2) in the prepared silica-titania catalyst is 1 to 50% by weight.

5,587,350

DIRECT THERMAL IMAGING MATERIAL

Bartholomeus C. Horsten, Rumst; Carlo A. Uyttendaele, Mortsel; Guy D. A. Jansen, Borsbeek, and Ronald Schuerwegen, Schelle, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

PCT No. PCT/EP93/03122, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO94/11199, PCT Pub. Date May 26, 1994

PCT Filed Nov. 6, 1993, Ser. No. 407,014

Claims priority, application European Pat. Off., Nov. 16, 1992, 92203495; Dec. 18, 1992, 92204009; Mar. 8, 1993, 93200652; Mar. 8, 1993, 93200653; Sep. 8, 1993, 93202599

Int. Cl.[6] B41M *5/40*

U.S. Cl. 503—201 **10 Claims**

1. A recording material comprising on a support (i) a heat sensitive layer comprising a substantially light insensitive organic silver salt, (ii) a protective layer containing a thermomeltable particle dispersed in a binder and (iii) a reducing agent being present in the heat sensitive layer and/or any other layer of the recording material on the same side of the support carrying the heat sensitive layer.

5,587,351

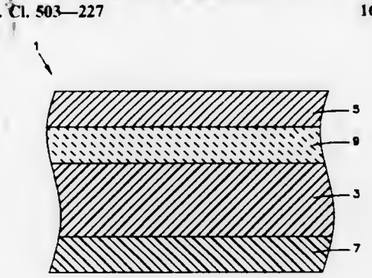
THERMAL TRANSFER SYSTEMS HAVING VANADIUM OXIDE ANTISTATIC LAYERS

Eric D. Morrison, West St. Paul; Jeffrey C. Chang, North Oaks, and Linda K. Williams, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 15,419, Feb. 9, 1993, abandoned. This application Aug. 22, 1994, Ser. No. 294,190

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **16 Claims**



4. A process for providing an image by a thermal transfer process comprising the steps of:

(a) providing a thermal transfer donor sheet and a thermal transfer receptor sheet in a facing relationship; and

(b) applying heat in an imagewise distributed manner to the donor sheet to cause material on the donor sheet to transfer to the receptor sheet;

wherein the receptor sheet comprises a flexible substrate having a front side and a back side, an image-receiving layer coated on the front side of the substrate, and a vanadium oxide antistatic layer coated on the flexible substrate, and wherein the antistatic layer is coated on the front

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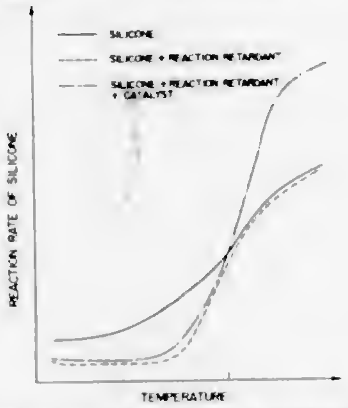
side of the flexible substrate and is positioned between the flexible substrate and the image-receiving layer.

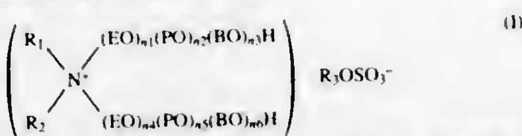
5,587,352
THERMAL TRANSFER IMAGE-RECEIVING SHEET AND PROCESS FOR PRODUCING THE SAME
Yoshihiko Tamura, and Mitsura Tsuchiya, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan
Division of Ser. No. 159,118, Nov. 30, 1993, Pat. No. 5,430,002. This application Apr. 10, 1995, Ser. No. 419,468
Claims priority, application Japan, Nov. 30, 1992, 4-341074; Nov. 30, 1992, 4-341075; Dec. 28, 1992, 4-358504
Int. Cl.⁶ B41M *5/035;5/38*
U.S. Cl. 503—227 **7 Claims**



1. A process for producing a thermal transfer image-receiving sheet, comprising the step of coating a coating solution containing a dye-receiving resin on at least one surface of a substrate sheet to form a dye-receiving layer, wherein said coating solution contains a release agent mixture comprising an addition-polymerizable silicone and a hydrogen-modified silicone.

5,587,353
AGRICULTURAL CHEMICAL COMPOSITION KIT COMPRISING QUATERNARY DI(POLYOXYALKYLENE) AMMONIUM ALKYL SULFATES
Yuichi Hioki; Kazuhiko Kurita; Keiko Kawabata, and Toshikazu Azuma, all of Wakayama, Japan, assignors to KAO Corporation, Tokyo, Japan
Division of Ser. No. 305,731, Sep. 14, 1994, Pat. No. 5,462,912, which is a continuation of Ser. No. 957,819, Oct. 8, 1992. This application Jun. 5, 1995, Ser. No. 462,881
Claims priority, application Japan, Oct. 9, 1991, 3-262014
Int. Cl.⁶ A01N *25/30;* **B65D** *85/82*
U.S. Cl. 504—116 **23 Claims**

1. A kit (1) comprising package (A) comprising a mixture of compounds represented by the following general formula (I) and having (n1+n2+n3) and (n4+n5+n6) each being a number of 0 to 100 on the average and package (B) comprising an agricultural chemical, wherein the weight ratio of the mixture to the agricultural chemical ranges from 0.1 to 50:



(I)

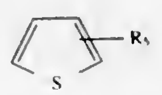
wherein R_1 and R_2 each represent a straight-chain or branched alkyl, alkenyl or hydroxyalkyl group having from 1 to 30 carbon atoms; R_3 represents a straight-chain or branched alkyl group having from 1 to 4 carbon atoms;
$(EO)_{n1}$ and $(EO)_{n4}$ each represent a polyoxyethylene chain;
$(PO)_{n2}$ and $(PO)_{n5}$ each represent a polyoxypropylene chain;
$(BO)_{n3}$ and $(BO)_{n6}$ each represent a polyoxybutylene chain;
n1, n2, n3, n4, n5 and n6 each are 0 or a positive integer; and (n1+n2 +n3) and (n4+n5+n6) each are 0 or a positive integer provided that at least one of (n1+n2 +n3) and (n4+n5+n6) is 1 or more.

5,587,354
DRILLING FLUID AND DRILLING FLUID ADDITIVE
William M. Duncan, Jr., Nueces County, Tex., assignor to Integrity Industries, Inc., Kingville, Tex.
Continuation of Ser. No. 142,953, Oct. 29, 1993, abandoned, which is a continuation of Ser. No. 950,491, Sep. 25, 1992, abandoned. This application Apr. 26, 1994, Ser. No. 233,501
Int. Cl.⁶ C09K *7/02*
U.S. Cl. 507—137 **10 Claims**

1. A water based drilling fluid comprising water, a weight material, a viscosifier and 1–8% of (a) 30–95 parts by volume of a cyclic terpene and (b) 70-5 parts by volume of an oil selected from the group consisting of vegetable oil, mineral oil and mixtures thereof.

5,587,355
HIGH LOAD-CARRYING TURBO OILS CONTAINING AMINE PHOSPHATE AND THIOPHENE CARBOXYLIC ACID DERIVATIVES
Morton Beltzer, Westfield; Paul J. Berlowitz, East Windsor, and Jeenok T. Kim, Holmdel, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Dec. 22, 1995, Ser. No. 577,659
Int. Cl.⁶ C10M *141/10;141/08;135/32;137/08*
U.S. Cl. 508—302 **9 Claims**

1. A turbo oil comprising a major mount of a base stock suitable for use as a turbo oil base stock comprising synthetic polyol ester and a minor mount of additives comprising a mixture of thiophene carboxylic acid (TCA) derivative represented by the structural formula



where R_5 is COOH or linear C_1–C_{12} alkanoic acid and one or more amine phosphate(s) wherein the amine phosphate is moaobasic hydrocarbyl amine salts of mixed mono- and di-acid phosphates, wherein the amine phosphate and TCA derivative are used in a weight ratio of 1:1 to 1:10, and wherein the TCA derivative is present in an mount by weight in the range 100 to 1,000 ppm and the amine phosphate is present in an amount in the range 50 to 300 ppm all based on base stock.

5,587,356
THICKENED, HIGHLY AQUEOUS, COST EFFECTIVE LIQUID DETERGENT COMPOSITIONS
Shelley L. Dauderman, Rising Sun, Ind.; Linda C. McWilliams, Cincinnati, Ohio; Hari A. Nair, Cincinnati, Ohio, and Gary G. Staud, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 3, 1995, Ser. No. 415,952
Int. Cl.⁶ C11D *3/386;3/330;1/12*
U.S. Cl. 510—320 **10 Claims**

1. A heavy duty liquid detergent composition which provides cost effective stain and soil removal performance when used in fabric laundering operations, which composition comprises:
(A) from about 10% to 12% by weight of the composition of an anionic surfactant component which is free of alkyl benzene sulfonate anionic surfactant materials and which comprises
(i) sodium C_{12}–C_{14} alkyl sulfates; and

(ii) sodium C_{12}–C_{16} alkyl ether sulfates containing from about 1 to 6 moles of ethylene oxide; in an alkyl sulfate to alkyl ether sulfate weight ratio of from about 1:4 to 1:1;
(B) from about 1% to 3% by weight of the composition of an nonionic surfactant component which is free of aromatic-based nonionic surfactants and which comprises C_{10}–C_{14} fatty alcohol ethoxylates containing from about 3 to 10 moles of ethylene oxide;
(C) from 0.1% to 0.4% by weight of the composition of a sodium citrate detergent builder;
(D) from about 0.2% to 0.4% by weight of the composition of an enzyme component which comprises one or more protease enzymes derived from Bacillus bacteria but contains no more than about 0.1% by weight of said composition of other types of detergent enzymes;
(E) from about 0.1% to 2% by weight of the composition of a viscosity-enhancing agent component selected from the group consisting of alkali metal and alkaline earth metal chlorides and formates, polyacrylic co-polymers having a molecular weight of from about 750,00 to 1,000,00 and combinations of said viscosity-enhancing agents;
(F) from about 0.1% to 1% by weight of the composition of one or more enzyme stabilizers selected from the group consisting of propylene glycol, boric acid, borax and combinations thereof;
(G) from about 82% to 90% by weight of the composition of an aqueous, non-surface active liquid carrier which comprises no more than 2% by weight of the composition of liquids other than water; and
(H) from about 0.1% to 0.5% by weight of the composition of phase stabilizers/co-solvent selected from the group consisting of methanol, ethanol, monoethanolamine, diethanolamine, triethanolamine, and combinations thereof.

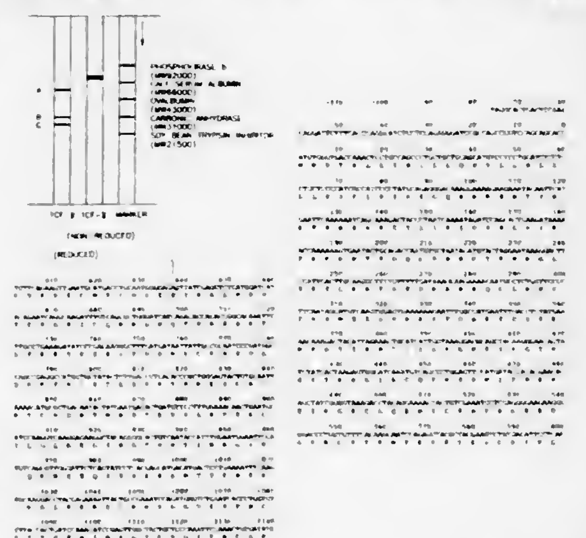
5,587,357
LIQUID CLEANING COMPOSITIONS
Robert Rhinesmith, Somerset, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.
Continuation-in-part of Ser. No. 303,243, Sep. 9, 1994, Pat. No. 5,462,690. This application Aug. 9, 1995, Ser. Nu. 512,853
The portion of the term of this patent subsequent to Oct. 31, 2012, has been disclaimed.
Int. Cl.⁶ C11D *1/20;1/72;1/722;3/18*
U.S. Cl. 510—417 **6 Claims**

1. A stable gelled microemulsion cleaning composition which comprises approximately by weight:
(a) 6% to 18% of a C_{10} to C_{20} unsaturated fatty acid;
(b) 0.4% to 7% of an alkali metal hydroxide;
(c) 0.1% to 5% of a hydrotrope;
(d) 1% to 7% of a nonionic surfactant selected from the group consisting of primary aliphatic alcohol ethoxylates, secondary aliphatic alcohol ethoxylates, alkyl phenol ethoxylates and ethylene oxide propylene oxide condensates on primary alkanols;
(e) 1% to 50% of a cosurfactant selected from the group consisting of C_{3-4} alkanols, polypropylene glycol of the formula $HO(CH_3CHCH_2O)_nH$, wherein n is a number from 2 to 18, monoalkyl ethers and esters having the formulas $R(X)_mOH$ and $R_1(X)_mOH$ where R is a C_1-C_6 alkyl group, R_1 is a C_2-C_4 acyl group, X is (OCH_2CH_2) or $(OCH_2(CH_3)CH)$ and m is a number from 1 to 4;
(f) 0.1% to 25% of a water insoluble hydrocarbon selected from the group consisting of perfume, d-limonene and paraffins or isoparaffins having about 6 to about 18 carbon atoms; and
(g) the balance being water, wherein the composition does not contain any organic or inorganic builder salt.

5,587,358
POTENTIATORS OF ANTIMICROBIAL ACTIVITY
Masayuki Sukigara, Suzuka, Japan, and Isao Kubo, Moraga, Calif., assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 9, 1994, Ser. No. 239,671
Int. Cl.⁶ A61K *38/12;31/11;31/405*
U.S. Cl. 514—11 **11 Claims**

2. A method for preventing the growth of a microorganism selected from the group consisting of gram-negative bacteria, gram-positive bacteria and yeast comprising contacting said microorganism with a polymyxin and a potentiator of antimicrobial activity, wherein said potentiator is indole, 3-methylindole, or t-2-hexenal.

5,587,359
HUMAN DERIVED GLYCOPROTEIN, BIOLOGICALLY ACTIVE FACTOR WHICH INCLUDES GLYCOPROTEIN AND PHARMACEUTICAL PRODUCT
Kanji Higashio; Shinjiro Mitsuda; Nobuyuki Shima, all of Saitama; Yasuharu Itagaki, and Masaya Nagao, both of Tochigi, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan
Continuation of Ser. No. 752,558, Sep. 6, 1991, abandoned. This application Sep. 12, 1994, Ser. No. 304,419
Claims priority, application Japan, Mar. 10, 1989, 1-58631; Jan. 16, 1990, 2-6692
Int. Cl.⁶ C07H *17/00;* **A01N** *37/00;* **C07K** *14/475*
U.S. Cl. 514—12 **5 Claims**



1. An isolated DNA molecule having a DNA sequence encoding a glycoprotein which is obtained from the culture broth of human derived fibroblasts and which is characterized by the following physicochemical properties:
a. Molecular weight; On the determinations of molecular weight of SDS gel electrophoresis, 78,000±2,000 or 74,000± 2,000 under the nonreduced conditions and a common band A with 52,000±2,000 and band B with 30,0001±2,000 or band C with 26,000±2,000 under the reduced conditions;
b. Isoelectric point; 7.4 to 8.6;
c. Heat stability; Stable in heating at 60° C. for 10 min.;
d. pH stability; Stable in the range of pH 6 to 9;
e. Carbohydrate chain; Adsorbed to a Concanavalin A (Con A)-Sepharose column;
f. Biological activity; Inhibits the growth of KB cells, Hela cells and L-929 cells but not IMR-90 cells;
g. Reactivity to antibodies; The cytotoxic activity is not neutralized by anti-TNF antibody, anti-lymphotoxin antibody and anti-interferon-β antibody;
h. N-terminal amino acid sequence; Above mentioned band B and band C are subchains of band A, respectively;

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N-terminus of band A is blocked; Band B and band C have a common N-terminal amino acid sequence as follow;

Val-Val-Asn-Gly-Ile-Pro-Thr-

or

Val — Val — Asn — Gly — Ile — Pro — Thr — X — THr —

Asn — Ile — Gly — X — Met — Val — Ser — Leu —

wherein X is an unidentified amino acid.

5,587,360

PLATELET ADHESION INHIBITOR

Roy T. Sawyer, Dyfed, United Kingdom, assignor to Merck Patent GmbH, Darmstadt, Germany

PCT No. PCT/GB91/01763, § 371 Date Apr. 9, 1993, § 102(e) Date Apr. 9, 1993, PCT Pub. No. WO92/07005, PCT Pub. Date Apr. 30, 1992

PCT Filed Oct. 10, 1991, Ser. No. 39,276

Claims priority, application United Kingdom, Oct. 10, 1990, 9022040

Int. Cl.[6] A61K *38/58*

U.S. Cl. 514—21 **13 Claims**

1. A purified protein isolated from the leech species *Hirudo medicinalis*, said purified protein being substantially free of leech-derived collagenase, capable of binding to native collagen in such a way that substantially no cleavage breakdown products of collagen molecules occur on SDS-PAGE, capable of inhibiting collagen-induced platelet aggregation or adhesion, having a molecular weight in the range of 60–70 kilodaltons in a reduced form and exhibiting optimum activity in inhibiting collagen-induced platelet aggregation at a pH of about 8.0 in the presence of co-factors Ca^{+2} and Mg^{+2}, said protein being obtained from secretions or extract of the tissue of said leech species by performing chromatographic purification steps using buffers containing about 12% ethanol to prevent protein loss by adsorption and removing said ethanol to obtain said purified protein.

5,587,361

OLIGONUCLEOTIDES HAVING PHOSPHOROTHIOATE LINKAGES OF HIGH CHIRAL PURITY

Phillip D. Cook, San Marcos, Calif., and Glenn Hoke, Mt. Airy, Md., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 297,703, Aug. 29, 1994, Pat. No. 5,506,212, and Ser. No. 58,023, May 5, 1993, Pat. No. 5,521,302, which is a division of Ser. No. 777,670, Oct. 15, 1991, Pat. No. 5,212,295, which is a continuation-in-part of Ser. No. 777,007, Oct. 16, 1991, abandoned, said Ser. No. 297,703is a continuation of Ser. No. 777,007. This application Jun. 6, 1995, Ser. No. 469,851

Int. Cl.[6] C07H *21/00*

U.S. Cl. 514—44 **18 Claims**

1. A phosphorothioate oligonucleotide complementary to a sequence of targeted RNA or DNA wherein at least 75% of the nucleoside units of said oligonucleotide are joined together by Sp phosphorothioate 3' to 5' intersugar linkages.

5,587,362

L-NUCLEOSIDES

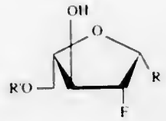
Chung K. Chu, Athens, Ga.; Yung-Chi Cheng, Woodbridge, Conn.; Balakrishna S. Pai, New Haven, Conn., and Gang-Qing Yao, Guilford, Conn., assignors to Univ. of GA Research Foundation, Athens, Ga., and Yale University, New Haven, Conn.

Filed Jan. 28, 1994, Ser. No. 189,070

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—46 **38 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of 5-methyluracil, adenine and cytosine, and R' is selected from the group of hydrogen, acyl, or alkyl or a monophosphate, diphosphate or triphosphate ester.

5,587,363

AMINOSUGAR AND GLYCOSAMINOGLYCAN COMPOSITION FOR THE TREATMENT AND REPAIR OF CONNECTIVE TISSUE

Robert W. Henderson, Baldwin, Md., assignor to Nutramax Laboratories, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 40,936, Mar. 31, 1993, Pat. No. 5,364,845. This application Mar. 14, 1994, Ser. No. 207,581

Int. Cl.[6] A61K *31/715;31/69*

U.S. Cl. 514—54 **22 Claims**

1. A therapeutic composition for treatment and repair of connective tissue in humans and animals comprising: therapeutic synergistic quantities of an aminosugar selected from the group consisting of glucosamine, glucosamine salts and mixtures thereof in combination with a glycosaminoglycan selected from the group consisting of chondroitin, chondroitin salts, and mixtures thereof.

5,587,364

USES OF ALOE PRODUCTS IN THE TREATMENT OF INFLAMMATORY DISEASES

Bill H. McAnalley, Grand Prairie; Robert H. Carpenter, Bastrop, and Harley R. McDaniel, Dallas, all of Tex., assignors to Carrington Laboratories, Inc., Irving, Tex.

Division of Ser. No. 159,830, Dec. 1, 1993, Pat. No. 5,441,943, which is a division of Ser. No. 864,583, Apr. 7, 1992, Pat. No. 5,308,838, which is a division of Ser. No. 558,905, Jul. 27, 1990, Pat. No. 5,118,673, which is a continuation-in-part of Ser. No. 229,164, Aug. 5, 1988, Pat. No. 5,106,616, which is a continuation-in-part of Ser. No. 144,872, Jan. 14, 1988, Pat. No. 4,851,224, which is a continuation-in-part of Ser. No. 869,261, Jun. 5, 1986, Pat. No. 4,735,935, which is a continuation-in-part of Ser. No. 810,025, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 754,859, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 750,321, Jun. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,967, Sep. 12, 1984, abandoned, which is a continuation of Ser. No. 375,720, May 7, 1982, abandoned. This application Jun. 5, 1995, Ser. No. 462,972

Int. Cl.[6] A61K *31/715*

U.S. Cl. 514—54 **9 Claims**

1. A method for treating an animal suffering from an inflammatory bowel disease, comprising:

administering to said animal an amount of acetylated mannan derivative of aloe origin sufficient to reduce the symptoms associated with said inflammatory bowel disease.

5,587,365

FUNGICIDAL MIXTURES

Horst Wingert; Hubert Sauter, both of Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Schelberger, Gönnheim, and Manfred Hampel, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 515,051, Aug. 14, 1995, Pat. No. 5,532,260, which is a division of Ser. No. 311,183, Sep. 23, 1994, Pat. No. 5,476,868. This application Feb. 13, 1996, Ser. No. 600,822

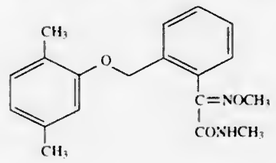
Claims priority, application Germany, Sep. 24, 1993, 43 32 600.5

Int. Cl.[6] A01N *37/18;43/50;43/64;55/00*

U.S. Cl. 514—63 **12 Claims**

1. A fungicidal mixture containing synergistic fungicidally effective amounts of

a) the oxime ether carboxamide of the formula



and

b) an azole compound selected from the group consisting of:

4-(4-chlorophenyl)-2-phenyl-2-(1H-1,2,4-triazolylmethyl)butyronitrile (fenbuconazole);

3-(2,4-dichlorophenyl)-6-fluoro-2-(1H-1,2,4-triazol-1-yl)quinazolin-4(3H) -one (fluquinconazole);

bis(4-fluorophenyl) (methyl) (1H-1,2,4-triazol-1-ylmethyl)silane (flusilazole);

N-propyl-N-[2-(2,4,6-trichlorophenoxy)ethyl]-imidazole-1-carboxamide (prochloraz); and

(±)-2-(2,4-dichlorophenyl)-3-(1H-1,2,4-triazol-1-yl)propyl 1,1,2,2-tetrafluoroethyl ether (tetraconazole);

wherein a) and b) are in a synergistic weight ratio of 10:1 to 0.1:1.

5,587,366

COMPOSITIONS USEFUL IN PROPHYLAXIS AND THERAPY OF ENDOTOXIN RELATED CONDITIONS

Thomas S. Parker, Brooklyn; Daniel M. Levine, New York, both of N.Y.; Albert L. Rubin, Englewood, N.J.; Bruce R. Gordon, and Stuart D. Saal, both of New York, N.Y., assignors to The Rogosin Institute, New York, N.Y.

Continuation-in-part of Ser. No. 288,568, Aug. 10, 1994, Pat. No. 5,506,218, which is a continuation-in-part of Ser. No. 928,930, Aug. 12, 1992, Pat. No. 5,344,822. This application Jun. 7, 1995, Ser. No. 487,461

Int. Cl.[6] A61K *31/685;31/56;31/22;31/23;31/13*

U.S. Cl. 514—78 **5 Claims**

1. Protein and peptide free composition useful in treating endotoxemia, comprising:

(a) neutral lipids in an amount ranging from about 3% to about 50% by weight total lipid in said composition, wherein at least a portion of said neutral lipids are triglycerides, and

(b) at least one phospholipid.

5,587,367

PHARMACEUTICAL OR COSMETIC COMPOSITION CONTAINING A COMBINATION OF A RETINOID AND A STEROL

Uwe Reichert, Le Bar S/Loup; Rainer Schmidt, Mougins, and Braham Shroot, Antibes, all of France, assignors to Centre International de Recherches Dermatologiques Galderma (CIRD Galderma), Valbonne, France

Division of Ser. No. 962,596, Mar. 2, 1993. This application May 23, 1995, Ser. No. 447,776

Claims priority, application France, Jul. 2, 1990, 90 08344

Int. Cl.[6] A61K *31/44;31/575;31/38;31/415*

U.S. Cl. 514—171 **23 Claims**

1. A pharmaceutical or cosmetic composition comprising in combination

at least one retinoid capable of inhibiting the expression of membranal transglutaminase, said retinoid having a heterocycle moiety, and

at least one sterol which functions as an inhibitor of the biosynthesis of cholesterol.

5,587,368

ADMINISTRATION OF A 27-HYDROXYCHOLESTEROL OR RELATED COMPOUND OR STEROL-27-HYDROXYLASE STIMULANT TO PREVENT RESTENOSIS FOLLOWING VASCULAR ENDOTHELIAL INJURY

Norman B. Javitt, New York, N.Y., assignor to New York University, New York, N.Y.

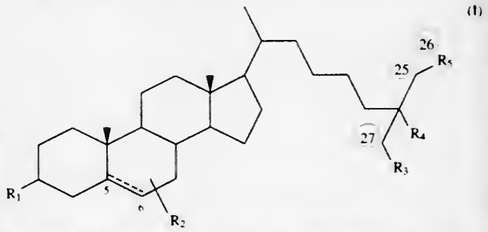
Continuation-in-part of Ser. No. 159,226, Nov. 30, 1993, Pat. No. 5,376,652. This application Oct. 6, 1994, Ser. No. 319,225

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—177 **22 Claims**

1. In a process wherein in a mammal, a therapeutic procedure is carried out to reduce or remove a stenosis present within a lumen of a blood vessel, the improvement to prevent restenosis which comprises administering to the mammal a restenosis preventing amount of a compound of formula (I):

(I)



wherein R_1 is hydroxyl or keto; R_2 is hydrogen, hydroxyl or keto; R_3 is hydroxyl, carboxyl, hydrogen or amino; R_4 and R_5 are hydrogen or amino; with the provisos that when R_3 is hydroxyl both R_4 and R_5 are hydrogen and when R_3 is not hydroxyl, at least one of R_3, R_4 and R_5 is amino ($—NH_2$) and the other(s) of them are hydrogen or amino, and pharmaceutically acceptable derivatives and salts thereof.

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5,587,369

METHODS FOR PREVENTING PROGRESSIVE TISSUE NECROSIS, REPERFUSION INJURY, BACTERIAL TRANSLOCATION AND ADULT RESPIRATORY DISTRESS SYNDROME

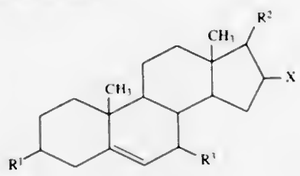
Raymond A. Daynes, Park City, and Barbara A. Araneo, Salt Lake City, both of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 446,569, May 19, 1995, Pat. No. 5,489,581, which is a division of Ser. No. 284,688, Aug. 9, 1994, Pat. No. 5,532,230, which is a continuation-in-part of Ser. No. 29,422, Mar. 9, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,744

Int. Cl.[6] **A61K** *31/56*

U.S. Cl. 514—178 **13 Claims**

1. A method for preventing or reducing adult respiratory distress syndrome (ARDS) in a patient at high risk of ARDS, which comprises administering a therapeutically effective amount of a compound of the formula



wherein

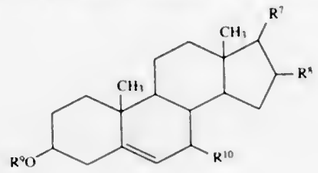
X is H or halogen;

R^1, R^2 and R^3 are independently =O, —OH, —SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, $—OSO_2R^5$ or $—OP(O)R^5R^6$;

R^5 and R^6 are independently —OH, pharmaceutically acceptable esters or pharmaceutically acceptable ethers; and

pharmaceutically acceptable salts,

with the proviso that said compound is not of the formula



wherein

R^7 is =O or OH;

R^8 is H or halogen when R^7 is =O and R^8 is H when R^7 is OH;

R^9 is H, fatty acid, C_{1-10} alkyl, C_{1-10} alkenyl, C_{1-10} acetylenic, $(Y)_n$-phenyl-C_{1-5}-alkyl, $(Y)_n$-phenyl-C_{1-5}-alkenyl or $—CO—R^{11}$;

R^{10} is H or OH;

R^{11} is H, fatty acid, C_{1-10} alkyl, C_{1-10} alkenyl, C_{1-10} acetylenic, $(Y)_n$-phenyl-C_{1-5}-alkyl or $(Y)_n$-phenyl-C_{1-5}alkenyl;

Y is the same or different, and is halogen, C_{1-4} alkyl, C_{1-4} alkenyl, C_{1-4} alkoxy, carboxy, nitro, sulfate, sulfonyl, C_{1-6} carboxylesters or C_{1-6} sulfate esters; and

n is 0, 1, 2 or 3.

5,587,370

ACARICIDALLY ACTIVE TETRAZINE DERIVATIVES

Janis Hajimichael; Sandor Botar; Edit Bleicher, all of Budapest; Laszlo Pap, Erd; Istvan Szekely, Dunakeszi; Katalin Marmarosi née Kellner, Biatorbagy, and Janos Ori, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyar RT., Budapest, Hungary

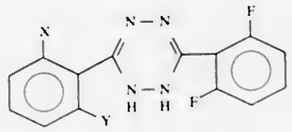
Continuation-in-part of Ser. No. 277,800, Jul. 20, 1994, Pat. No. 5,455,237. This application Aug. 30, 1995, Ser. No. 521,253

Claims priority, application Hungary, Jul. 21, 1993, 2098/93

Int. Cl.[6] **A01N** *43/713;* **C07D** *257/08*

U.S. Cl. 514—183 **7 Claims**

1. A compound of the Formula (IV)



(IV)

wherein

X is fluoro, chloro or bromo; and

Y is fluoro or hydrogen.

4. An acaricidal, larvicidal, and ovicidal active composition which comprises 0.5 to 99% by weight of a compound of the Formula (IV) as defined in claim 1, together with a carrier, diluting, filling or surface active agent.

5,587,371

TEXAPHYRIN-OLIGONUCLEOTIDE CONJUGATES

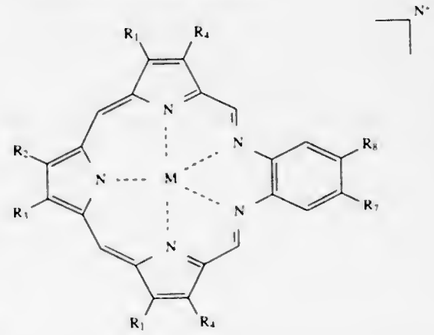
Jonathan L. Sessler, Austin, Tex.; Tarak D. Mody; Gregory W. Hemmi, both of Sunnyvale, Calif.; Vladimir A. Král, Austin, Tex., and Darren Magda, Cupertino, Calif., assignors to Pharmacyclics, Inc., Sunnyvale, Calif., and Board of Trustees, Univ. of TX Sys., Austin, Tex.

Continuation of Ser. No. 437,968, May 10, 1995, which is a continuation-in-part of Ser. No. 135,118, Oct. 12, 1993, Pat. No. 5,457,183, which is a continuation-in-part of Ser. No. 75,123, Jun. 19, 1993, abandoned, and Ser. No. 822,964, Jan. 21, 1992, Pat. No. 5,252,720. This application Jun. 2, 1995, Ser. No. 458,909

Int. Cl.[6] **A61K** *31/715;* **C07D** *487/22*

U.S. Cl. 514—185 **42 Claims**

1. A texaphyrin having the structure:



wherein,

M is H, a divalent metal cation or a trivalent metal cation;

each of R_1, R_2, R_3, R_4, R_7, and R_8 is independently hydrogen, hydroxyl, alkyl, hydroxyalkyl, oxyalkyl, oxyhydroxyalkyl, saccharide, oxyaminoalkyl, carboxy, carboxyalkyl, carboxyamidealkyl, an oligonucleotide or a couple to an oligonucleotide, where at least one of R_1, R_2, R_3, R_4, R_7 and R_8 is an oligonucleotide or a couple to an oligonucleotide; and

N is zero, 1 or 2.

5,587,372

CEPHALOSPORINS

Jozsef Aszodi, Pontault Combault; Jean-Francois Chantot, Gressy En France; Patrick Fauveau, Livry Gargan; Solange G. D'Ambrieres, Paris; Daniel Hunbert, Fonenay Sous Bois, and Christophe Dini, Le Plessis Pate, all of France, assignors to Roussel Uclaf, France

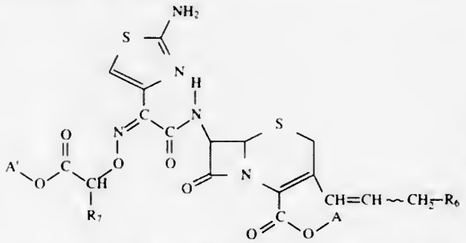
Continuation-in-part of Ser. No. 989,235, Dec. 11, 1992, Pat. No. 5,455,238. This application Dec. 13, 1993, Ser. No. 167,192

Claims priority, application France, Dec. 12, 1991, 91 15416; Sep. 28, 1992, 92 11520

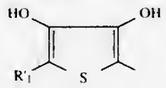
Int. Cl.[6] **C07D** *501/24;* **A61K** *31/545*

U.S. Cl. 514—202 **19 Claims**

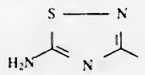
1. A syn isomer in (R) or (S) form or a mixture thereof of a compound of the formula



syn isomer, in the (R) or (S) form or in the form of an (R,S) mixture, in the form of an internal salt or their salts with organic or mineral acids wherein R_7 is selected from the group consisting of

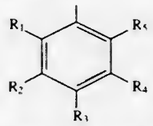


K



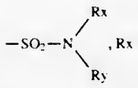
L

and

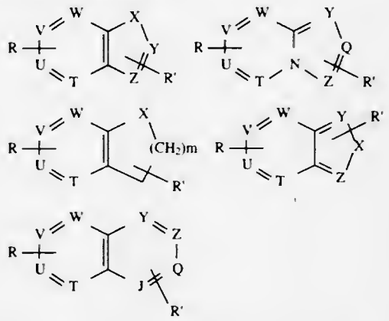


M

R'_1 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, —CN, carboxy and alkoxy carbonyl of 1 to 4 alkoxy carbon atoms, R_1, R_2, R_3 and R_5 are individually selected from the group consisting of hydrogen, halogen, hydroxy, alkyl of 1 to 4 carbon atoms optionally substituted with at least one member of the group consisting of halogen, alkoxy and alkylthio of 1 to 4 carbon atoms, $—NO_2$, —CN, $—NH_2$, mono- and dialkylamino of 1 to 4 carbon atoms, carbamoyl, (alkylamino) carbonyl of 2 to 5 carbon atoms, (dialkylamino) carbonyl of 3 to 9 carbon atoms, carboxy, alkoxycarbonyl of 2 to 5 carbon atoms, acyloxy of 1 to 8 carbon atoms and



and Ry are individually hydrogen or alkyl of 1 to 4 carbon atoms, R_4 is —OH or alkoxy of 1 to 8 carbon atoms, A and A' are individually selected from the group consisting of hydrogen, an equivalent of an alkali metal or alkaline earth metal, magnesium ammonium and an organic amine, or one or two of —COOA or —COOA' are $—CO_2$, the wavy line means $—CH_2R_6$ can be in the E or Z position, R_6 in the quaternary ammonium form is selected from the group consisting of



I

X is selected from the group consisting of $—CH_2$, —NH—, —O— and —S—, Q, J, Y, T, U, V, W and Z are individually =N— or —CH=, each of cyclics containing 1 to 5 heteroatoms selected from the group consisting of oxygen, sulfur and nitrogen of which at least one is =N— and optionally substituted by at least one R or R', R and R' are individually selected from the group consisting of halogen, alkyl and alkoxy of 1 to 4 carbon atoms, halogen, —CN, $—COOQ_1$, $—CONQ_1Q_2$, $—NQ_1Q_2$, $—SO_2NQ_1Q_2$, $—CSNH_2$, $—NHCOQ_1$, —CH=NOH, $—CH=N—O—Q_1$, $—CH_2CH$, $—SQ_1$, and $—CH_2—S—Q_1$, Q_1 and Q_2 are individually hydrogen or alkyl of 1 to 4 carbon atoms, with the proviso that when R_3 is —OH or alkoxy of 1 to 8 carbon atoms, at least one of R_1, R_2 and R_5 is other than hydrogen.

5,587,373

2-ACYLOXYCEPHEM DERIVATIVES

Marco Alpegiani, Milan; Pierluigi Bissolino, San Giorgio di Lomellina, and Ettore Perrone, Boffalora Ticino, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

PCT No. PCT/EP94/00529, § 371 Date Nov. 4, 1994, § 102(e) Date Nov. 4, 1994, PCT Pub. No. WO94/20504, PCT Pub. Date Sep. 15, 1994

PCT Filed Feb. 24, 1994, Ser. No. 331,483

Claims priority, application United Kingdom, Mar. 4, 1993, 9304440

Int. Cl.[6] **C07D** *501/04;501/14;501/60;* **A61K** *31/545*

U.S. Cl. 514—202 **12 Claims**

1. A compound of the formula (I), or a pharmaceutically or veterinarily acceptable salt thereof;

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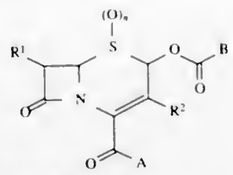


(I)

wherein n is one or two;

A and B are each, independently, hydrogen or an organic radical selected from optionally substituted C_1–C_{12} straight or branched alkyl, C_2–C_{12} alkenyl, C_2–C_{12} alkynyl, C_6–C_{14} aryl, C_3–C_8 cycloalkyl, C_5–C_8 cycloalkenyl, or C_7–C_{18} aralkyl, C_8–C_{18} aralkenyl, C_8–C_{18} aralkynyl, (C_{3-8}cycloalkyl) alkyl, (C_{3-8}cycloalkyl) alkenyl, heterocyclyl, (heterocyclyl) alkyl and (heterocyclyl)alkenyl groups, wherein a heterocyclyl group is a 3- to 6-membered, saturated or unsaturated heterocyclyl ring containing at least one hetero atom selected from the group consisting of O, S and N, which is optionally fused to a second 5- or 6-membered, saturated or unsaturated heterocyclyl group, to a cycloalkyl group or to an aryl group;

R^1 represents

(1) a chlorine, fluorine, bromine or iodine atom;

(2) A as defined above;

(3) an ether OA wherein A is as defined above;

(4) a thioether, sulphoxide or sulphone —$S(O)_m$A wherein m is either zero, one or two and A is as defined above;

(5) acyloxy —OC(O)A wherein A is as defined above;

(6) sulfonyloxy —$OS(O)_2$A wherein A is as defined above;

(7) an acylamino group —NHC(O)A wherein A is as defined above or acylamino —NH—Z wherein Z is a mono, di- or tripeptide composed of D or L α-aminoacids selected from the group consisting of Ala, Gly, Val, Leu, Ile and Phe and with the terminal amino group either free or acylated by a group —C(O)A or —C(O)OA wherein A is as defined above;

R^2 represents

(1) A as defined above;

(2) a chlorine or fluorine atom;

(3) a sulphenyl, sulfinyl or sulfonyl group —$S(O)_m$A wherein A is as defined above;

(4) an oxy group —O—A wherein A is as defined above;

(5) an acyl group —C(O)A or acyloxy group —C(O)OA wherein A is as defined above;

(6) on oxymethyl group —CH_2—OA wherein A is as defined above;

(7) a thiomethyl group or a derivative thereof of formula —$CH_2S(O)_m$A wherein m and A are as defined above;

(8) an acyloxymethyl group —CH_2OC(O)A or —CH_2O—Z wherein A and Z are as defined above;

(9) an acylthiomethyl group —CH_2SC(O)A wherein A is as defined above;

(10) an aminomethyl group —CH_2—N(A)A' wherein A is as defined above and A', being the same or different, is as defined above for A; or A and A' taken together with the nitrogen atom to which they are attached represent a heterocyclic ring;

(11) ammoniomethyl —CH_2N^+(A)(A')A" wherein A and A' are as defined above and A", being the same or different, is as defined for A; or A is alkyl and A' and A" together with the nitrogen atom to which they are attached represent a heterocyclic ring, or A and A' and A" together with the nitrogen atom to which they are attached represent a heterocyclic ring, wherein a heterocyclic ring is of the same cyclic structure defined above for a heterocyclyl group;

(12) an acylaminomethyl group —CH_2NH—C(O)A or —CH_2NH—Z wherein A and Z are as defined above.

5,587,374

10(1-HYDROXYETHYL)-11-OXO-1-AZATRICYCLO/7.2.0.0.^{3,8}/UNDEC-2-ENE-2-CARBOXYLIC ACID ESTERS AND A PROCESS FOR PREPARING THEREOF

Alcide Perboni, San Giorgio de Mantova; Tino Rossi, Verona; Giovanni Gaviraghi, Verona; Giorgio Tarzia, Verona, and Antonella Ursini, Verona, all of Italy, assignors to Glaxo SpA, Verona, Italy

Division of Ser. No. 264,239, Jun. 22, 1994, which is a continuation of Ser. No. 848,005, May 20, 1992, abandoned. This application Feb. 14, 1995, Ser. No. 388,515

Claims priority, application United Kingdom, Aug. 21, 1990, 9018330; Mar. 7, 1991, 9104770

Int. Cl.^{6} C07D *487/00;* **A61K** *31/395*

U.S. Cl. 514—210 **3 Claims**

1. 1-Cyclohexyloxycarbonyloxethyl (4S,8S,9R,10S, 12R)-4-methoxy-10-(1-hydroxyethyl)-11-oxo-1-azatricyclo[7.2.0.0.^{3,8}]undec-2-ene-2-carboxylate.

5,587,375

AZEPINONE COMPOUNDS USEFUL IN THE INHIBITION OF ACE AND NEP

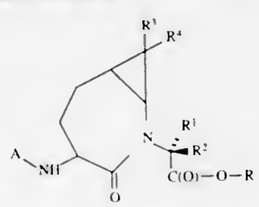
Jeffrey A. Robl, Newtown, Pa., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Feb. 17, 1995, Ser. No. 390,717

Int. Cl.^{6} C07D *223/32;* **A61K** *31/55*

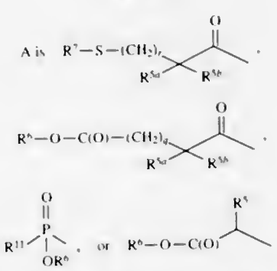
U.S. Cl. 514—213 **8 Claims**

1. A compound of the following formula II, or a pharmaceutically acceptable salt thereof:

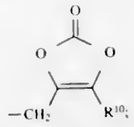


(II)

wherein,



R and R^6 are each independently hydrogen, alkyl, substituted alkyl, aryl-$(CH_2)_p$—, substituted aryl-$(CH_2)_p$—, heteroaryl-$(CH_2)_p$—, —CH(R^8)—O—C(O)—R^9, or



R^1 and R^2 are each independently hydrogen, alkyl, substituted alkyl, cycloalkyl-$(CH_2)_p$—, aryl-$(CH_2)_p$—, substituted aryl-$(CH_2)_p$—, heteroaryl-$(CH_2)_p$—, or R^1 and R^2 may form, together with the carbon to which they are bonded, a 3 to 7 membered carbocyclic ring, where said ring is optionally substituted by alkyl, or by aryl which is fused or bonded by a single bond to said ring;

R^3 and R^4 are each independently hydrogen, alkyl, aryl, halo, or —C(O)—OR, where R is as defined above;

R^5, R^{5a}, and R^{5b} are each independently hydrogen, alkyl, alkenyl, cycloalkyl, substituted alkyl, substituted alkenyl, aryl, substituted aryl, heteroaryl, cycloalkyl-alkylene-, aryl-alkylene-, substituted aryl-alkylene-, and heteroaryl-alkylene-, or R^{5a} and R^{5b} may form, together with the carbon to which they are bonded, a 3 to 7 membered carbocyclic ring, where said ring is optionally substituted by alkyl, or by aryl which is fused or bonded by a single bond to said ring;

R^7 is hydrogen, R^8—C(O)—, or R^{12}—S—;

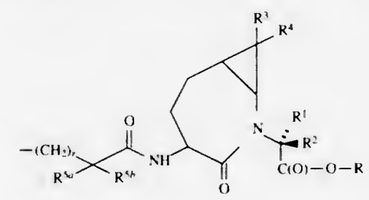
R^8 is hydrogen, alkyl, substituted alkyl, cycloalkyl-$(CH_2)_p$—, aryl-$(CH_2)_p$—, substituted aryl-$(CH_2)_p$—, or heteroaryl-$(CH_2)_p$—;

R^9 is hydrogen, alkyl, alkoxy, or aryl;

R^{10} is alkyl or aryl-$(CH_2)_p$—;

R^{11} is alkyl, substituted alkyl, cycloalkyl-$(CH_2)_p$—, aryl-$(CH_2)_p$—, substituted aryl-$(CH_2)_p$—, or heteroaryl-$(CH_2)_p$—;

R^{12} is hydrogen, alkyl, substituted alkyl, cycloalkyl-$(CH_2)_p$—, aryl-$(CH_2)_p$—, substituted aryl-$(CH_2)_p$—, or heteroaryl-$(CH_2)_p$—, or—S—R^{12} completes a symmetrical disulfide wherein R^{12} is



p is zero or an integer from 1 to 6;

q is zero or an integer from 1 to 3; and

r is zero or one.

5,587,376

METHODS FOR USING (2-IMIDAZOLIN-2-YLAMINO) QUINOXALINE DERIVATIVES

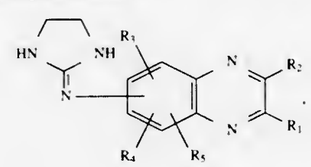
James A. Burke, Tustin; Michael E. Garst, Newport Beach, and Larry A. Wheeler, Irvine, all of Calif., assignors to Allergan, Waco, Tex.

Division of Ser. No. 390,265, Feb. 15, 1995, which is a continuation of Ser. No. 135,716, Oct. 13, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,949

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—249 **18 Claims**

1. A method of treating a mammal comprising administering to a mammal an effective amount to provide a desired therapeutic effect in said mammal of a compound selected from the group consisting of those having the formula



and pharmaceutically acceptable acid addition salts thereof and mixtures thereof, wherein R_1 and R_2 each is selected from the group consisting of H, alkyl radicals containing 1 to 4 carbon atoms and alkoxy radicals containing 1 to 4 carbon atoms provided that R_1 and R_2 are not both H, the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8- positions of the quinoxaline nucleus, and R_3, R_4 and R_5 each is located in one of the remaining 5-, 6-7-or 8-positions of the quinoxaline nucleus and is independently selected from the group consisting of CL, Br, H and alkyl radicals containing 1 to 3 carbon atoms, said desired therapeutic effect being selected from the group consisting of constriction of one or more blood vessels and decongestion of one or more nasal passages.

5,587,377

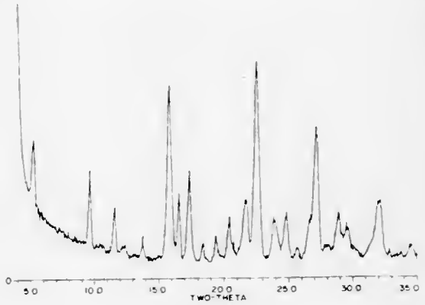
TERAZOSIN CRYSTALLINE POLYMORPH AND PHARMACEUTICAL COMPOSITIONS THEREOF

Mahendra R. Patel, East Brunswick; Kasireddy C. Reddy, New Brunswick, and Pankaj J. Dave, Kendall Park, all of N.J., assignors to Invamed, Inc., Dayton, N.J.

Filed Oct. 24, 1995, Ser. No. 547,209

Int. Cl.^{6} C07D *239/84;* **A61K** *31/505*

U.S. Cl. 514—254 **3 Claims**



1. A novel crystalline polymorph 1-(4-amino-6, 7-dimethoxy-2-quinazolinyl-4-(tetrahydrofuroyl) piperazine monohydrochloride monohydrate Form-IV, characterized by peaks in the powder X-ray diffraction pattern at values of two theta of 5.24±0.2, 9.66±0.2, 11.55±0.2, 15.84±0.2, 16.58 ±0.2, 17.39±0.2, 19.41±0.2, 20.42±0.2, 21.67±0.2, 22.55±0.2, 23.90 ±0.2, 24.81±0.2, 26.70±0.2, 27.17±0.2, 28.86±0.2, 29.46±0.2, 31.66 ±0.2, 31.99±0.2.

5,587,378

THERAPEUTIC AGENT FOR PARKINSON'S DISEASE

Fumio Suzuki, Mishima; Junichi Shimada, Shizuoka-ken; Nobuaki Koike, Shizuoka-ken; Joji Nakamura, Shizuoka-ken; Shizuo Shiozaki, Fuji; Shunji Ichikawa, Shizuoka-ken; Akio Ishii, Shizuoka-ken, and Hiromi Nonaka, Shizuoka-ken, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 133,510, Oct. 17, 1993, Pat. No. 5,484,920, which is a continuation-in-part of Ser. No. 42,535, Apr. 5, 1993, abandoned. This application May 23, 1995, Ser. No. 447,885

Claims priority, application Japan, Apr. 8, 1992, 4-87715; Sep. 28, 1992, 4-257834

Int. Cl.^{6} A61K *31/52*

U.S. Cl. 514—264 **14 Claims**

1. A method of treating Parkinson's disease which comprises

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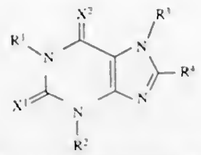
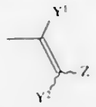
administering to a patient suffering from Parkinson's disease an effective amount of a xanthine derivative of the following formula (I):

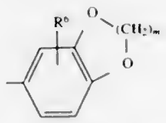


(I)

in which R^1, R^2, and R^3 are independently hydrogen, lower alkyl, or allyl; and R^4 is cycloalkyl, $-(CH_2)_n-R^5$, in which R^5 is unsubstituted or substituted phenyl or naphthyl, having 1 to 3 independently-selected substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, halogen, nitro and amino, or a substituted or unsubstituted heterocyclic group, wherein the heterocyclic group is selected from the group consisting of furyl, thienyl, pyrrolyl, pyranyl, thiopyranyl, pyridyl, thioazolyl, imidazolyl, pyrimidyl, triazinyl, indolyl, quinolyl, purinyl, and benzothiazolyl; and n is an integer of 0 to 4, or



wherein Y^1 and Y^2 is independently hydrogen or methyl; and Z is unsubstituted or substituted phenyl or naphthyl having 1 to 3 independently-selected substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, halogen, nitro and amino,



wherein R^6 is hydrogen, hydroxy, lower alkyl, lower alkoxy, halogen, nitro, or amino; and m represents an integer of 1 to 4, or a substituted or unsubstituted heterocyclic group wherein the heterocyclic group is furyl, thienyl, pyrrolyl, pyranyl, thiopyranyl, pyridyl, thioazolyl, imidazolyl, pyrimidyl, triazinyl, indolyl, quinolyl, purinyl, or benzothiazolyl; and X^1 and X^2 are independently O or S, or a pharmaceutical acceptable salt thereof.

5,587,379

INSECTICIDAL 5-SUBSTITUTED-2,4-DIAMINOPYRIMIDINE DERIVATIVES

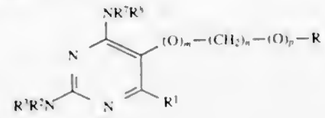
Robert N. Henrie, II, East Windsor; Clinton J. Peake, Trenton; Thomas G. Cullen, Milltown; Albert C. Lew, Princeton Junction; Munirathnam K. Chaguturu, Lawrenceville, all of N.J.; Partha S. Ray, Memphis, Tenn., and Walter H. Yeager, Yardley, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 237,481, May 3, 1994, Pat. No. 5,521,192, which is a continuation-in-part of Ser. No. 985,084, Dec. 2, 1992, abandoned. This application May 22, 1995, Ser. No. 446,354

Int. Cl.[6] A01N *43/54*

U.S. Cl. 514—275 **6 Claims**

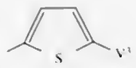
1. An insecticidal composition comprising, in admixture with an agriculturally acceptable carrier, an insecticidally effective amount of a compound of the formula:



(I)

wherein

R is



(V)

wherein

V^3 is halogen, lower alkyl, lower haloalkyl, cyano, or aminocarbonyl;

and wherein

R^1 is hydrogen, lower alkyl, amino, phenyl, or phenyl lower alkyl;

R^2, R^3, R^7 and R^8 are independently selected from hydrogen, lower alkyl, lower alkylcarbonyl, and lower alkoxycarbonyl;

m is 0 or 1;

n is 2 to 11; and

p is 0 or 1,

and agriculturally acceptable salts thereof, with the proviso that when m, n, and p are 0, R is other than hydrogen; and with the further proviso that when m and p are 1, n must be at least 1.

5,587,380

CERTAIN 2,4-DIAMINO-5-(2,3,5-TRI-CHLOROPHENYL)-6-SUBSTITUTED-PYRIMIDINES WHICH ARE PHARMACOLOGICALLY ACTIVE CNS COMPOUNDS

Alistair A. Miller; Malcolm S. Nobbs; Richard M. Hyde, and Michael J. Leach, all of Beckenham, England, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

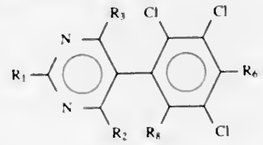
Division of Ser. No. 444,963, Dec. 4, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,518

Claims priority, application United Kingdom, Dec. 7, 1988, 8828620; Apr. 14, 1989, 8908561; Aug. 18, 1989, 8918893

Int. Cl.[6] A61K *31/405;* **C07D** *239/48*

U.S. Cl. 514—275 **20 Claims**

1. A pyrimidine of formula (I):



(I)

wherein:

R_1 is selected from the group consisting of NH_2, N-(C_1-C_6 alkyl)amino and N,N-di(C_1-C_6 alkyl)amino;

R_2 is NH_2;

R_3 is selected from the group consisting of hydrogen, C_1-C_6 alkyl, trifluoromethyl, C_1-C_6 alkoxy, C_1-C_6 alkylthio, (C_1-C_6 alkyl)thio(C_1-C_6 alkyl), di[(C_1-C_6 alkyl)oxy]C_1-C_6 alkyl), and $-CH_2X$ wherein X is selected from the group consisting of hydroxy, C_1-C_6 alkoxy, phenoxy and benzyloxy;

R_6 is selected from the group consisting of NH_2, hydrogen, halo and nitro; and

R_8 is hydrogen or halo;

and pharmaceutically acceptable acid addition salts thereof.

5,587,381

METHOD FOR TERMINATING METHADONE MAINTENANCE THROUGH EXTINCTION OF THE OPIATE-TAKING RESPONSES

John D. Sinclair, Nokkalanniemi 7, SF-02230 Espoo, Finland

Filed Mar. 27, 1995, Ser. No. 410,529

Int. Cl.[6] A61K *31/485;31/44;31/135*

U.S. Cl. 514—282 **9 Claims**

1. A method for terminating methadone maintenance therapy and addiction to other legally-available opiates by selective extinction of the opiate-taking response, comprising the steps of:

withholding all opiates from a subject suffering from addiction to a legally-available opiate for a sufficient time to prevent an opiate antagonist when administered to the subject from causing precipitous withdrawal; and

thereafter administering to the subject an opiate antagonist selected from the group consisting of nalmefene, naltrexone, naloxone, cyclazocine, etazocine, levallorphan, metazocine, nalorphine, and salts thereof in a daily dosage sufficient to block the effects of opiate agonists;

while the amount of the antagonist in the subject's body is sufficient to block opiate effects, having the subject self-administer the legally-available opiate agonist to which he or she is addicted;

withholding the opiate antagonist from the subject;

when the amount of antagonist is no longer sufficient to block opiate effects, not allowing the subject to self-administer opiates; and

continuing the above steps of administration of the opiate antagonist and the subject's taking of the opiate and the withholding of the antagonist for a period when the subject cannot take opiates until the opiate-taking behavior is extinguished.

5,587,382

6,9-BIS[(2-AMINOETHYL) AMINO]BENZO [G]ISOQUINOLINE-5,10- DIONE DIMALEATE; AN AZA-ANTHRACENEDIONE WITH REDUCED CARDIOTOXICITY

A. Paul Krapcho, Shelburne; Miles P. Hacker, Williston, both of Vt.; Ennio Cavalletti, Monza, and Ferdinando C. Giuliani, Cassina de Pecchi, both of Italy, assignors to Boehringer Mannheim Italia, SpA, Monza, Italy

Continuation-in-part of Ser. No. 218,946, Mar. 28, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 467,874

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—290 **4 Claims**

1. A method of treatment of tumors susceptible to azaanthracene-dione therapy in a mammal requiring such treatment, which method causes minimal cardiotoxicity, comprising administering to the mammal an effective anti-tumor amount of the compound 6,9-bis[(2-aminoethyl)-amino]-benzo[g]isoquinoline-5,10-dione or a physiologically acceptable salt thereof wherein the mammal has been previously treated with mitoxantrone, doxorubicin, or any other anthracycline used in human therapy and has shown cardiotoxicity with said prior treatment.

5,587,383

IMIDAZOPYRIDINE DERIVATIVES AND THEIR USE

Muneo Takatani, Kyoto; Yoshio Kozai, Toyonaka; Kiminori Tomimatsu, Minoo, and Yumiko Shibouta, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

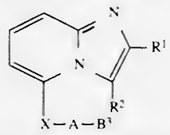
Division of Ser. No. 74,292, Jun. 9, 1993, Pat. No. 5,395,839, which is a division of Ser. No. 736,957, Jul. 30, 1991, Pat. No. 5,244,908. This application Feb. 10, 1995, Ser. No. 387,010

Claims priority, application Japan, Jul. 30, 1990, 2-202963; Jul. 30, 1990, 2-202964; May 27, 1991, 3-121277; Jun. 12, 1991, 3-140186

Int. Cl.[6] A61K *31/435;* **C07D** *471/02*

U.S. Cl. 514—300 **6 Claims**

1. A compound of the formula (I"):

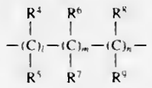


(I")

wherein X is S, S(O) $S(O)_2$, O or NR^3 (wherein R^3 is a hydrogen or an optionally substituted hydrocarbon group);

A is a hydrocarbon group selected from the group consisting of

(1) a group represented by the formula



wherein l, m and n are integers of 0 to 5;

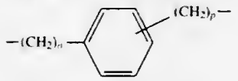
R^4, R^5, R^6, R^7, R^8 and R^9 are hydrogen, an optionally substituted lower alkyl, aralkyl or aryl group; and wherein R^4 and R^5, R^6 and R^7 or R^8 and R^9 may bind together to form a ring, or R^4 or R^6 may bind together with R^8 or R^9 to form a ring;

(2) a group represented by the formula

$-CH_2CH_2OCH_2CH_2-$;

and

(3) a group represented by the formula



wherein o and p are integers of 0 to 5;

R^1 and R^2 are the same or different and are a hydrogen, an optionally substituted hydrocarbon group, a halogen, a nitro group, a nitroso group, an optionally protected amino group, a lower alkoxycarbonyl group or a lower alkyl carbamoyl group; and

B^3 is a hydroxyl group acylated by an acyl group derived from a carboxylic acid or a N-hydrocarbon substituted carbamic acid, or its salt or solvate.

5,587,384

INHIBITORS OF POLY(ADP-RIBOSE) SYNTHETASE AND USE THEREOF TO TREAT NMDA NEUROTOXICITY

Jie Zhang; Valina L. Dawson; Ted M. Dawson, and Solomon H. Snyder, all of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md., and The United States of America, Washington, D.C.

Filed Feb. 4, 1994, Ser. No. 191,508

Int. Cl.[6] A61K *31/165;31/47*

U.S. Cl. 514—309 **20 Claims**

1. A method of treating a disease condition caused by NMDA neurotoxicity in a mammal comprising:

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administering to a mammal which demonstrates symptoms of a disease condition caused by NMDA neurotoxicity a therapeutically effective amount of an inhibitor of poly (ADP-ribose) synthetase.

5,587,385

ARYLIDENE-HETEROCYCLIC DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Franco Buzzetti, Monza; Silvia Fustinoni, Milan; Maria G. Brasca, Cusago, and Sergio Penco, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.r.L., Milan, Italy

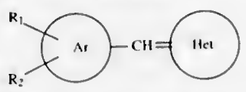
Division of Ser. No. 400,113, Mar. 6, 1995, which is a continuation of Ser. No. 988,867, Dec. 10, 1992, abandoned. This application May 26, 1995, Ser. No. 452,288

Claims priority, application United Kingdom, Dec. 24, 1991, 9127401; Jan. 29, 1992, 9201906; Mar. 24, 1992, 9206369

Int. Cl.[6] A61K *31/47;31/475;* **C07D** *401/06;401/08*

U.S. Cl. 514—309 **5 Claims**

1. A method of treating a pathological proliferative disorder comprising administering to a patient a therapeutically effective amount of a compound of formula (IA)

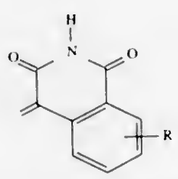


(IA)

wherein

Ar is mono- or bicyclic ring system selected from quinoline or indole;

Het is:



R is hydrogen, halogen, hydroxy, C_1–C_6 alkoxy, C_2–C_6 acyloxy, cyano, nitro, amino or —$COOR_3$ in which R_3 is hydrogen or C_1–C_6 alkyl;

R_1 is hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_2–C_6 acyloxy, cyano, nitro, amino or —$COOR_3$ in which R_3 is as defined above; and

R_2 is hydrogen, halogen, hydroxy or C_1–C_6 alkyl, or its pharmaceutically acceptable salt.

5,587,386

OPTICALLY ACTIVE PYRIDONECARBOXYLIC ACID DERIVATIVES

Isao Hayakawa, and Youichi Kimura, both of Tokyo, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

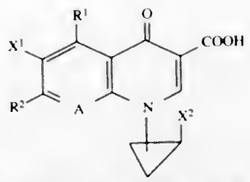
Continuation of Ser. No. 610,916, Nov. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 343,567, Apr. 27, 1989, abandoned. This application Oct. 28, 1993, Ser. No. 142,105

Claims priority, application Japan, Apr. 27, 1988, 63-104625; Nov. 24, 1988, 63-296984

Int. Cl.[6] C07D *471/04;215/56;* **A61K** *31/47;31/44*

U.S. Cl. 514—312 **9 Claims**

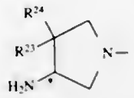
1. A stereoisomerically pure N_1-(1,2-cis-2-halogenocyclopropyl)-substituted pyridonecarboxylic acid derivative represented by the following formula (I):



(I)

wherein R^1 represents a hydrogen atom, an amino group, a hydroxyl group or a thiol group;

R^2 represents a substituent represented by the following formula:



wherein R^{23} and R^{24} together are $(CH_2)j$; where j=2 to 5;

A represents C—X^3 or a nitrogen atom;

X^1 and X^2, which may be the same or different, each represents a halogen atom;

and X^3 represents a halogen atom, an alkyl group of from 1 to 6 carbon atoms, an alkoxyl group from 1 to 6 carbon atoms, a cyano group, a trifluoromethyl group, or a hydrogen atom;

or a pharmaceutically acceptable salt thereof.

5,587,387

HETEROCYCLE-SUBSTITUTED BENZENEMETHANAMINE DERIVATIVES

Marcel A. C. Janssen, Vosselaar; Georges H. P. Van Daele, Turnhout; Jean-Paul R. M. A. Bosmans, Edegem; Marc G. C. Verdonck, Gierle, and Paul A. J. Janssen, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

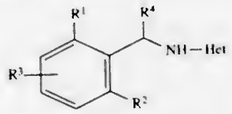
Continuation-in-part of Ser. No. 240,737, May 12, 1994, Pat. No. 5,480,997. This application May 2, 1995, Ser. No. 432,748

Claims priority, application European Pat. Off., Dec. 30, 1991, 91203431

Int. Cl.[6] A61K *31/47;* **C07D** *215/38;215/22;215/20*

U.S. Cl. 514—312 **6 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt form or a stereochemically isomeric form thereof, wherein:

R^1 and R^2 each independently are halo or methyl;

R^3 is hydrogen, halo, nitro or trifluoromethyl;

R^4 is

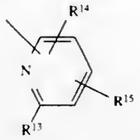
trifluoromethyl or methyl carbonyl; or

a radical —C(=X)—NR^5R^6 wherein X is O or S, and R^5 and R^6 each independently are hydrogen or C_{1-4}alkyl; or

a radical -Alk-R^7, wherein Alk is C_{1-4}alkanediyl; and

R^7 is hydrogen or hydroxy; and

Het is a heterocyclic radical of the formula:



(d)

wherein:

R^{14} and R^{15} taken together form C_{3-4}alkanediyl, and

R^{13} is hydrogen or hydroxy, wherein in the heterocyclic radical (d), a nitrogen atom can optionally be oxidized,

PROVIDED THAT when the heterocyclic radical (d) is a 5,6,7,8-tetrahydro- 4-quinolinyl group, R^{13} is hydroxy.

5,587,388

IRREVERSIBLE HIV PROTEASE INHIBITORS, INTERMEDIATES, COMPOSITIONS AND PROCESSES FOR THE PREPARATION THEREOF

Sung C. Kim; Nakyen Choy; Chang S. Lee; Young C. Son; Ho I. Choi; Jong S. Koh; Heungsik Yoon; Chi H. Park, and Sang S. Kim, all of Daejeon, Rep. of Korea, assignors to Lucky Limited, Seoul, Rep. of Korea

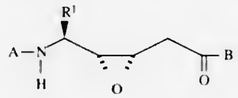
Filed Nov. 30, 1993, Ser. No. 159,382

Claims priority, application Rep. of Korea, Dec. 2, 1992, 92-23088; Dec. 2, 1992, 92-23089; Jun. 14, 1993, 93-10811; Oct. 14, 1993, 93-21298; Oct. 14, 1993, 93-21299; Oct. 14, 1993, 93-21300

Int. Cl.[6] C07D *215/38;* **A61K** *31/47*

U.S. Cl. 514—314 **4 Claims**

1. Cis-epoxide compounds of formula (I-1) and pharmaceutically acceptable salts, hydrates and solvates thereof:

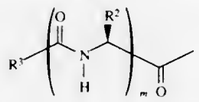


(I-1)

wherein:

R^1 is a cycloalkyl, or aryl-substituted lower alkyl group;

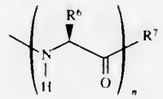
A is a functionalized acyl group of the formula



(wherein R^2 is a C_{1-4} alkyl, or amide-substituted C_{1-2} alkyl group;

R^3 is a quinoline radical; and m is 0 or 1); and

B is a functionalized amino group of the formula



(wherein R^6 is a C_{1-4} alkyl, arylalkyl, or amide-substituted C_{1-2} alkyl group; R^7 is a C_{1-3} alkoxy, C_{1-3} alkylamino, C_{1-3} alkoxy-amino or amino group substituted with two C_{1-3} alkyl groups; and n is 1 or 2).

5,587,389

SUBSTITUTED HETEROARYLAKLYLTHIOPYRIDINES FOR CONTROLLING HELICOBACTER BACTERIA

Bernhard Kohl; Jörg Senn-Bilfinger, and Gerhard Grundler, all of Konstanz, Germany, assignors to BYK Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Germany

PCT No. PCT/EP94/00393, § 371 Date Aug. 15, 1995, § 102(e) Date Aug. 15, 1995, PCT Pub. No. WO94/19346, PCT Pub. Date Sep. 1, 1994

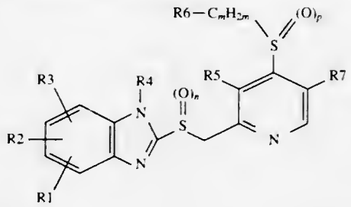
PCT Filed Feb. 11, 1994, Ser. No. 505,270

Claims priority, application Switzerland, Feb. 17, 1993, 00507/93

Int. Cl.[6] A61K *31/415;31/44;* **C07D** *213/70;233/42*

U.S. Cl. 514—338 **10 Claims**

1. A compound of the formula I



(I)

in which

R1 is hydrogen, 1–4C-alkyl or 1–4C-alkoxy,

R2 is hydrogen, 1–4C-alkyl, 1–4C-alkoxy, halogen, trifluoromethyl, fully or predominantly fluorine-substituted 1–4C-alkoxy, chlorodifluoromethoxy, 2-chloro-1,1,2-trifluoroethoxy, or, if desired, together with R3 1–2C-alkylenedioxy which is fully or partially substituted by fluorine, or chlorotrifluoroethylenedioxy,

R3 is hydrogen, 1–4C-alkoxy which is fully or predominantly substituted by fluorine, or is chlorodifluoromethoxy, 2-chloro-1,1,2-trifluoroethoxy, or, if desired, together with R2 1–2C-alkylenedioxy which is fully or partially substituted by fluorine, or chlorotrifluoroethylenedioxy,

R4 is hydrogen or 1–4C-alkyl,

R5 is hydrogen, 1–4C-alkyl or 1–4C-alkoxy,

R6 is a heterocycle selected from the group consisting of furan, thiophene, pyrrole, oxazole, isoxazole, thiazole, isothiazole, imidazole, pyrazole, 1,2,3-triazole, 1,2,4-triazole, tetrazole, 1,3,4-thiadiazole, 1,2,4-thiadiazole, pyrimidine and pyridine, each of which is substituted by R8 and R9,

R7 is hydrogen, 1–4C-alkyl or 1–4C-alkoxy,

R8 is hydrogen, 1–4C-alkyl, 1–4C-alkoxy, halogen, guanidino, 1–4C-alkyl which is substituted by R10, or —N(R11)R12,

R9 is hydrogen, 1–4C-alkyl, 1–4C-alkoxy or halogen,

R10 is hydroxyl, 1–4C-alkoxy or —N(R11)R12, where

R11is hydrogen, 1–4C-alkyl or —CO—R13 and

R12 is hydrogen or 1–4C-alkyl, or where

R11 and R12 together and including the nitrogen atom to which both are bonded represent a piperidino or morpholino radical,

R13 is hydrogen, 1–4C-alkyl or 1–4C-alkoxy,

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m is a number from 1 to 7,
n is the number 0 or 1 and
p is the number 0 or 1,
or a salt thereof.

5,587,390

IMIDAZOLE DERIVATIVES HAVING A II ANTAGONIST ACTIVITY

Aldo Salimbeni; Fabio Paleari; Jacques Mizrahi, and Carlo Scolastico, all of Milan, Italy, assignors to Istituto Luso Farmaco D'Italia S.p.A., Milan, Italy

PCT No. PCT/EP93/02024, § 371 Date Mar. 17, 1995, § 102(e) Date Mar. 17, 1995, PCT Pub. No. WO94/03449, PCT Pub. Date Feb. 17, 1994

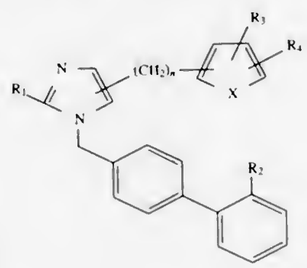
PCT Filed Jul. 29, 1993, Ser. No. 379,468

Claims priority, application Italy, Aug. 7, 1992, MI92A1951

Int. Cl.[6] **A61K** *31/44;31/415;* **C07D** *233/56;401/06*

U.S. Cl. 514—341 **11 Claims**

1. Compounds of general formula (I):



(I)

wherein:

n is 0, 1 or 2

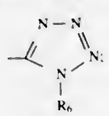
X is O, S,

$$-CH=\underset{\underset{Y}{|}}{Z}-,$$

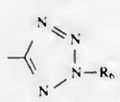
wherein Z is C or N, whereas Y is H, when Z is C or oxygen or it is not present, when Z is the same as N;

R_1 is C_1–C_5 straight, branched or cyclic alkyl, or a C_2–C_5 alkenyl group;

R_2 is a —$COOR_5$ group, —CN, a SO_3H group, or a tetrazole group of general formula (IIa) or (IIb):



(IIa)



(IIb)

R_3, R_4 are independently H, halogen, CN, NO_2, NH_2, COR_7, OR_8, CH_2OR_8, C_1–C_5 straight or branched alkyl;

R_5 is H, C_1–C_5 straight or branched alkyl, benzyl;

R_6 is H, C_1–C_5 alkyl, triphenylmethyl;

R_7 is H, OR_8, NR_9R_{10};

R_8 is H, C_1–C_5 straight or branched alkyl, benzyl;

R_9, R_{10} are independently H, C_1–C_5 alkyl;

and the salts thereof with pharmaceutically acceptable acids and bases.

5,587,391

CYCLOPENTANE(ENE) HEPTENOIC OR HEPTANOIC ACIDS AND DERIVATIVES THEREOF USEFUL AS THERAPEUTIC AGENTS

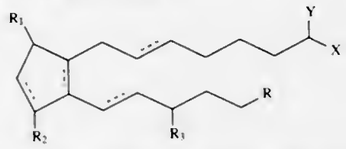
Robert M. Burk, Laguna Beach, Calif., assignor to Allergan, Waco, Tex.

Division of Ser. No. 174,535, Dec. 28, 1993, Pat. No. 5,545,665. This application Jul. 11, 1995, Ser. No. 445,842

Int. Cl.[6] **A61K** *31/44;* **C07D** *213/56*

U.S. Cl. 514—357 **9 Claims**

1. A method of treating ocular hypertension which comprises applying to the eye an amount sufficient to treat ocular hypertension of a compound of formula (I)



wherein either the cyclopentane(ene) radical or the α or ω chain may be unsaturated; R is pyridyl; R_1, R_2 and R_3 are selected from the group consisting of hydroxy and hydrocarbyloxy radicals wherein said hydrocarbyloxy radical comprises up to 20 carbon atoms; Y an oxo radical and X represents an amino or a mono or dialkyl amino radical; provided, however, at least one of R_1, R_2 and R_3 is a hydrocarbyloxy radical.

5,587,392

AZOLYL METHYL PHENYL DERIVATIVES HAVING AROMATASE INHIBITORY ACTIVITY

Kimihiro Murakami; Shuhei Ohnishi; Takashi Yano, and Manabu Itoh, all of Tokyo, Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

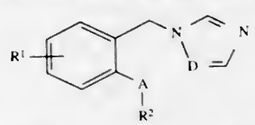
Filed May 26, 1995, Ser. No. 453,054

Claims priority, application Japan, May 27, 1994, 6-115664

Int. Cl.[6] **A61K** *31/41;* **C07D** *403/12;403/10;247/18*

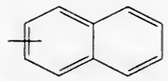
U.S. Cl. 514—359 **24 Claims**

1. A compound represented by the following formula (I):



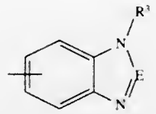
(I)

wherein A represents methylene group, oxygen atom or sulfur atom; D represents nitrogen atom R^1 represents halogen atom, cyano group, nitro group, C_1 to C_2 alkoxy group which may or may not be substituted with one or two or more fluorine atoms, C_1 to C_2 alkyl group which may or may not be substituted with one or two or more fluorine atoms, C_2 to C_5 alkenyl group linear or branched, C_2 to C_5 alkynyl group linear or branched, C_1 to C_2 alkoxycarbonyl group, carboxyl group, acetyl group, formyl group or hydrogen atom; R^2 represents an atomic group represented by formula (II);



(II)

or formula (III);



(III)

wherein E represents nitrogen atom or methine group; and R^3 represents hydrogen atom or C_1 to C_4 alkyl group linear or branched, or a salt thereof.

5,587,393

BENZIMIDAZOLES, PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS AND PROCESSES FOR PREPARING THEM

Berthold Narr; Norbert Hauel, both of Biberach; Jacques Van Meel, Mittelbiberach; Wolfgang Wienen, Apfingen; Michael Entzeroth, Warthausen, and Uwe Ries, Biberach, all of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

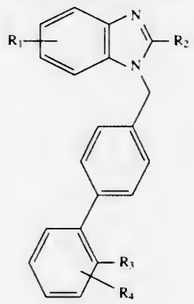
Division of Ser. No. 220,472, Mar. 30, 1994, Pat. No. 5,385,925, which is a continuation of Ser. No. 732,868, Jul. 19, 1991, abandoned. This application Sep. 1, 1994, Ser. No. 299,693

Claims priority, application Germany, Jul. 23, 1990, 40 23 369.3; Oct. 4, 1990, 40 31 287.9; Feb. 20, 1991, 41 05 324.0

Int. Cl.[6] **A61K** *31/42;* **C07D** *257/04;235/06*

U.S. Cl. 514—381 **6 Claims**

1. A method for treating hypertension in a patient which comprises administering to the patient a therapeutically effective amount of a benzimidazole of the formula I



wherein

R_1 represents a maleic acid imido group optionally mono- or disubstituted by a C_{1-3}-alkyl or by a phenyl group, in which the substituents may be identical or different;

R_2 represents a hydrogen atom or a straight-chained or branched C_{1-5}-alkyl group in which a methylene group my be replaced by a sulfur atom;

R_3 represents a carboxy, cyano, 1H-tetrazolyl or 1-triphenylmethyl-tetrazolyl group or an alkoxycarbonyl group with a total of 2 to 5 carbon atoms; and,

R_4 represents a hydrogen, fluorine, chlorine or bromine atom;

or, a pharmaceutically acceptable salt thereof.

5,587,394

PRODUCTION AND USE OF DIELS ALDER ADDUCTS OF VINYL PORPHYRINS, OF METAL COMPLEXES THEREOF, AND OF COMPOSITIONS CONTAINING SUCH ADDUCTS AND COMPLEXES

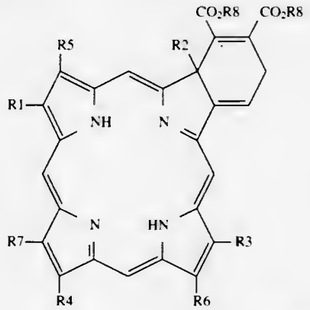
Alan R. Morgan, Santa Barbara, Calif., and Steven H. Selman, Toledo, Ohio, assignors to The University of Toledo, and Medical College of Ohio, both of Toledo, Ohio

Continuation-in-part of Ser. No. 321,387, Oct. 11, 1994, which is a continuation-in-part of Ser. No. 912,079, Jul. 8, 1992, Pat. No. 5,354,858, which is a continuation of Ser. No. 677,408, Mar. 28, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,364

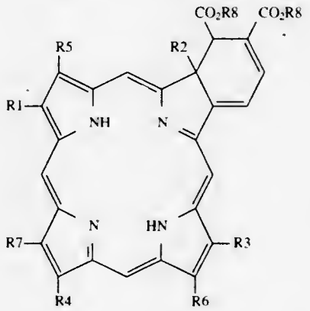
Int. Cl.[6] **C07D** *487/22;* **A61K** *31/66*

U.S. Cl. 514—185 **6 Claims**

1. A method for detecting diseased tissue in a living mammal which comprises administering intravenously, intramuscularly, subcutaneously or topically to a human or animal patient an effective amount of a Diels Alder adduct or of a metal complex of a Diels Alder adduct and, after healthy tissue has rejected the Diels Alder adduct or the metal complex, examining the patient under illumination which causes residual Diels Alder adduct or metal complex to fluoresce, wherein the Diels Alder adduct has the structure of Formula 9 or of Formula 10, and the metal complex of a Diels Alder adduct has the structure of Formula 3 or of Formula 4:



Formula 9



Formula 10

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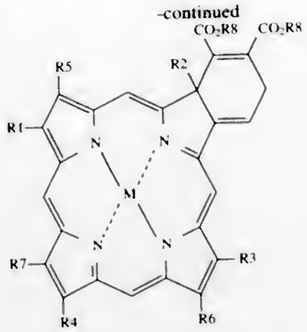
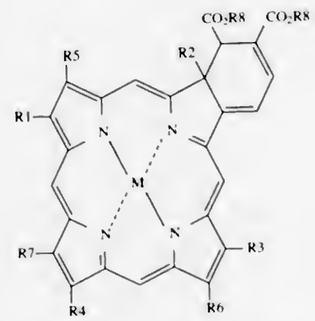
Formula 3



Formula 4



where

M comprises a metal cation that is complexed with two of the nitrogens of the adduct and is Ag, Al, Ce, Co, Cr, Dy, Er, Eu, Ga, Gd, Hf, Ho, In, La, Lu, Mn, Mo, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Se, Sm, Sn, Tb, Tc-99m, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr.

R1, R2, R3 and R4 can be the same or different, and each is methyl, ethyl, an amino acid moiety which is a part of an amide produced by reaction between an amine function of a naturally occurring amino acid and a carbonyl function of the adduct, or a monoclonal antibody moiety which is attatched to the adduct moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of a monoclonal antibody and a CO_2R', CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the adduct, and wherein the moiety is of a monoclonal antibody which selectively binds to malignant tumors,

R5, R6 and R7 can be the same or different, and each is ethyl, an amino acid moiety which is a part of an amide produced by reaction between an amine function of a naturally occurring amino acid and a carbonyl function of the adduct, or a monoclonal antibody moiety which is attatched to the adduct moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of a monoclonal antibody and a CO_2R', CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the adduct, and wherein the moiety is of a monoclonal antibody which selectively binds to malignant tumors, and

R8 is an alkyl group other than t-butyl having from one to four carbon atoms.

5,587,395

METALLO-ORGANIC COBALT COMPOUNDS AND USES THEREOF

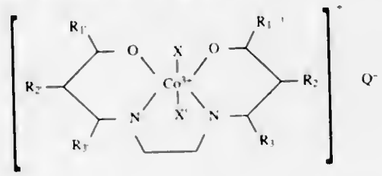
Zvi Dori, Haifa, and David Gershon, Kiryat Tavon, both of Israel, assignors to Chai-Tech Corporation, Greenvale, N.Y.

Division of Ser. No. 146,395, Nov. 1, 1993, Pat. No. 5,409,914, which is a continuation of Ser. No. 895,526, Jun. 2, 1992, Pat. No. 5,258,403, which is a division of Ser. No. 606,070, Oct. 30, 1990, Pat. No. 5,142,076, which is a continuation of Ser. No. 279,417, Dec. 2, 1988, Pat. No. 5,049,557, which is a continuation-in-part of Ser. No. 147,713, Jan. 25, 1988, Pat. No. 4,866,054, and a continuation-in-part of Ser. No. 147,714, Jan. 25, 1988, Pat. No. 4,866,053, each which is a continuation-in-part of Ser. No. 862,804, May 13, 1986, abandoned. This application Apr. 25, 1995, Ser. No. 428,532

Int. Cl.[6] **A61K** *31/295;* **C07F** *15/06*

U.S. Cl. 514—501 **25 Claims**

1. A method of treating a subject having a condition associated with the presence of free radicals in quantities sufficient to cause undesirable symptoms which comprises administering to the subject a compound in an amount effective to alleviate the undesirable symptoms, the compound having the structure:



wherein

R_1 and $R_{1'}$ are the same or different and each is an alkyl group, a phenyl group or a substituted derivative of a phenyl group;

R_2 and $R_{2'}$ are the same or different and each is hydrogen, an unbranched alkyl group a halide or a group having the structure

$$R-\underset{\underset{O}{\|}}{C}-$$

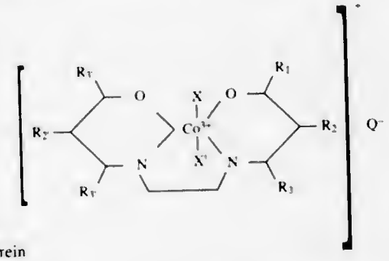
wherein R is hydrogen, an alkoxide group, an alkyl group or OH;

R_3 and $R_{3'}$ are the same or different and each is hydrogen or an alkyl group;

X and X' are the same or different and each is a water-soluble group having weak to intermediate ligand field strength; and

Q^- is a soluble, pharmaceutically acceptable negative ion.

17. A method of treating a wound or a burn which comprises topically administering to the wound or burn a compound having the structure



wherein

R_1 and $R_{1'}$ are the same or different and each is an alkyl group, a phenyl group or a substituted derivative of a phenyl group;

R_2 and $R_{2'}$ are the same or different and each is hydrogen, an unbranched alkyl group a halide or a group having the structure

$$R-\underset{\underset{O}{\|}}{C}-$$

wherein R is hydrogen, an alkoxide group, an alkyl group or OH;

R_3 and $R_{3'}$ are the same or different and each is hydrogen or an alkyl group;

X and X' are the same or different and each is a water-soluble group having weak to intermediate ligand field strength; and

Q^- is a soluble, pharmaceutically acceptable negative ion.

22. A method of treating a wound or burn which comprises topically administering to the wound or burn a complex comprising a Co(III) complex having an octahedral basal plane defined by four donor atoms A, which may be same or different, and two axial ligand donor atoms B, which may be the same or different, said donor atoms having a low to intermediate ligand field strength, said complex reacting with O_2^- to form a Co(III)-O_2 adduct or oxidizing O_2^- to produce dioxygen and a Co(II) complex.

5,587,396

METHOD OF AMELIORATING CELLULITE BY DISRUPTING THE BARRIER FUNCTION OF THE STRATUM CORNEUM

Walter P. Smith, New Canaan, Conn., assignor to Mary Kay Inc., Dallas, Tex.

Filed Aug. 26, 1994, Ser. No. 296,513

Int. Cl.[6] **A61K** *31/19*

U.S. Cl. 514—557 **15 Claims**

1. A method of ameliorating a cellulite condition comprising application of a topical treatment composition to skin areas overlying cellulite, said treatment composition being effective to chronically disrupt the barrier function of the stratum corneum and to inhibit barrier repair until a desired amelioration of cellulite is achieved.

5,587,397

REDUCTION OF ELEVATED BLOOD LACTATE USING TWICE-DAILY DICHLOROACETATE

Anthony W. Fox, Rancho La Costa, Calif., assignor to Cypros Pharmaceutical Corporation, Carlsbad, Calif.

Filed Jun. 8, 1995, Ser. No. 488,977

Int. Cl.[6] **A61K** *31/19*

U.S. Cl. 514—557 **5 Claims**

1. A method of administering dichloroacetate to a human patient suffering from undesirably elevated levels of lactate in hypoxic tissue or circulating blood, comprising the step of injecting a physiologically acceptable salt of dichloroacetate into the patient twice over a 24-hour period, at dosages sufficient to sustain a substantial reduction in lactate concentration in the patient's blood for at least 24 hours.

5,587,398

META SUBSTITUTED ARYLALKYLAMINES AND THERAPEUTIC AND DIAGNOSTIC USES THEREFOR

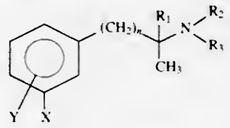
David R. Elmaleh, 38 Hartman Rd., Newton, Mass. 02159, and Alan J. Fischman, Boston, Mass., assignors to David R. Elmaleh, Newton, Mass.

Continuation-in-part of Ser. No. 265,512, Jun. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 254,032, Jun. 3, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 461,577

Int. Cl.[6] **A61K** *31/135;* **C07C** *15/04*

U.S. Cl. 514—654 **9 Claims**

1. A compound having the structural formula:



wherein,

X=CF_3, CH_3, C_2H_5 or Cl_3;

Y=Cl or Br ; ortho, para or meta to X;

n=1,2 or 3;

R_1=H and R_2 and R_3 =acyl, alkenyl and alkynyl groups; or

R_1=CH_3 and R_2 and R_3=H, alkyl, acyl, alkenyl and alkynyl groups.

5,587,399

METHOD FOR PREPARING MEDICAL FOODS FOR THE NUTRITIONAL SUPPORT OF INFANTS/TODDLERS WITH METABOLIC DISEASES

Phyllis J. B. Acosta, Westerville; Richard A. Grondalski, Columbus; Jeffrey W. Liebrecht, Columbus, and Patricia A. Reynolds, Columbus, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 997,278, Dec. 23, 1992, abandoned. This application Apr. 20, 1994, Ser. No. 230,452

Int. Cl.[6] **A61K** *31/195;33/42;33/34;33/32;33/26;33/36;33/06;38/00, 31/70;31/715;31/415;31/40;31/34;31/19;31/07*

U.S. Cl. 514—561 **23 Claims**

1. A method for preparing a composition of matter having utility for the nutritional support of infants and toddlers having inherited diseases of metabolism, the method comprising:

(a) preparing a premix base which is a composition of matter that is essentially free of protein and amino acids and consists essentially of fats comprising 30 to 40% by dry weight of the premix base, carbohydrates comprising 60 to 70% by dry weight of the premix base, minerals comprising 0.1 to 8% by dry weight of the premix base, vitamins comprising 0.1 to 1.0% of the premix base, trace elements, carnitine, taurine and antioxidants;

(b) preparing a blend of synthetic α-amino acids is specific for a given inherited disease of metabolism which comprises up to 18 different synthetic α-amino acids selected from the group consisting of L-alanine, L-arginine, L-aspartic acid, L-cystine, L-glutamatic acid, L-glutamine, glycine, L-histidine, L-isoleucine, L-leucine, L-lysine, L-methionine, L-proline, L-phenylalanine, L-serine, L-threonine, L-tryptophan, L-tyrosine and L-valine; and

(c) mixing the blend of synthetic α-amino acids with the premix base so that the composition is in powered form with the premix base comprising about 75 to 90% by dry weight of the composition and the blend of synthetic α-amino acids comprising about 9 to 25% by dry weight of the composition, and wherein the composition is free of intact protein.

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5,587,400

PHYSIOLOGICAL COMPOSITION FOR THE TREATMENT OF THERMAL OR CHEMICAL BURNS

Joël Blomet, Valmondois; Marie-Claude Blomet épouse Meyer, 243 Rue de Vaugirard, Paris, and Dominique F. Jahan, Maurecourt, all of France, assignors to Marie-Claude Blomet épouse Meyer, Paris, France

Filed Apr. 14, 1994, Ser. No. 227,648

Claims priority, application France, Apr. 19, 1993, 93 04585; Jul. 6, 1993, 93 08278

Int. Cl.[6] A61K *31/195*

U.S. Cl. 514—566 **17 Claims**

1. A physiological composition for the treatment of thermal or chemical burns comprising an Al(OH)Y complex, wherein Y is the ethylenediaminetetraacetic ligand and the concentration of Al(OH)Y is 0.05 mole/l to 1.0 mole/l.

5,587,401

REPELLENTS FOR ANTS

Robert K. Vander Meer; William A. Banks, and Clifford S. Lofgren, all of Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 286,111, Aug. 4, 1994, which is a continuation of Ser. No. 925,685, Aug. 7, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,354

Int. Cl.[6] A01N *35/02;35/04*

U.S. Cl. 514—675 **1 Claim**

1. A method for repelling ants from an object or area comprising treating the object or area with an ant repelling composition comprising

(i) an effective amount of 3-octen-2-one; and (ii) a carrier material.

5,587,402

REGRESSION OF MAMMALIAN LEUKEMIA CELL TUMORS

Michael N. Gould, Madison, Wis.; Pamela L. Crowell, Indianapolis, Ind.; Charles E. Elson, and Steven S. Clark, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 865,561, Apr. 9, 1992, Pat. No. 5,414,019. This application May 4, 1995, Ser. No. 434,811

Int. Cl.[6] A61K *31/045*

U.S. Cl. 514—729 **3 Claims**

1. A method for causing the regression of a leukemia cell malignancy, comprising the step of administering to a leukemia cell malignancy-containing mammal an effective amount of perillyl alcohol.

5,587,403

ORGANIC SOLVENT & WATER RESISTANT HYDROLYTICALLY STABLE ULTRAVIOLET RADIATION CURABLE COATINGS FOR OPTICAL FIBERS

Paul J. Shustack, West Chester, Ohio, assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 454,585, May 31, 1995, Pat. No. 5,538,791, which is a division of Ser. No. 341,172, Nov. 16, 1994, Pat. No. 5,527,835, which is a continuation of Ser. No. 169,544, Dec. 20, 1994, abandoned, and a continuation of Ser. No. 873,105, Apr. 24, 1992, abandoned. This application Jan. 17, 1996, Ser. No. 587,984

Int. Cl.[6] C08J *7/04;* **G02B** *6/02;6/00*

U.S. Cl. 522—42 **17 Claims**

1. A process for preparing a coated optical fiber comprising

(1) applying to an optical glass fiber a primary coating composition layer comprising

(A) from about 10 percent to about 90 percent by weight, based upon total weight of (A), (B), (C) and (D), of an acrylate or methacrylate terminated urethane oligomer, said oligomer having a number average molecular weight of not more than about 4,430 daltons which oligomer consists essentially of only carbon, hydrogen, nitrogen and oxygen atoms and which is the reaction product of (i) a polyether polyol; (ii) an aliphatic polyisocyanate; and (iii) an endcapping monomer capable of providing an acrylate or methacrylate terminus;

(B) from about 5 percent to about 80 percent by weight, based upon total weight of (A), (B), (C) and (D), of one or more monomer diluents which do not adversely affect the composition when cured and which are selected from the group consisting of

(i) alkyl acrylate and methacrylate monomers having 6 to 18 carbon atoms in the alkyl moiety;

(ii) monomers having (1) an aromatic moiety, (2) a moiety containing acrylic or methacrylic unsaturation, and (3) a hydrocarbon moiety, which monomer (ii) is capable of increasing the refractive index of the composition relative to that of a composition containing only (A), (C) and (D), and

(iii) mixtures thereof;

(C) from about 0.1 percent to about 3.0 percent by weight, based upon total weight of (A), (B), (C) and (D), of an organofunctional silane adhesion promoter; and

(D) optionally, from about 1.0 percent to about 10.0 percent by weight, based on total weight of (A), (B), (C), and (D), of a photoinitiator,

wherein the primary coating composition, after radiation cure, remains adherent and exhibits thermal, hydrolytic and oxidative stability at temperatures in excess of 90° C. and at 95% relative humidity and exhibits an increase in length from swelling of no more than about 40 percent when soaked in gasoline at room temperature for four hours and a water absorption value of no more than about 5% by weight;

wherein the primary coating layer composition is devoid of acid-functional materials; and

wherein the primary coating layer composition, after radiation cure, has a tensile modulus of less than 500 psi; and

(2) radiation-curing said primary coating composition layer in situ.

5,587,404

GELS WITH THERMOTROPIC PROPERTIES

Hubertus Kröner, Neustadt; Ekkehard Jahns, Hirschberg, and Manfred Mielke, Heidelberg, all of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 18, 1995, Ser. No. 423,850

Claims priority, application Germany, Apr. 22, 1994, 44 14 088.6

Int. Cl.[6] C08K *3/00*

U.S. Cl. 522—85 **7 Claims**

1. A gel for thermotropic layers, obtained by irradiation of a mixture comprising

a) an uncrosslinked polymer selected from the group consisting of poly-N-vinylcaprolactam, copolymers of N-vinylcaprolactam containing at least 20% by weight of N-vinylcaprolactam and polyvinyl ethers, said uncrosslinked polymer having thermotropic properties such that a 10% by weight solution of this polymer in water or an organic solvent or mixtures thereof brings about, in a switching range covering less than 20° C., a change in the transmission of light at a wavelength of 600 nm and at a path length of 10 mm such that less than 50% of the incident light is transmitted at temperatures above the switching range and at least 70% of the incident light is transmitted below the switching range,

b) monomers capable of free-radical polymerization and

c) water or an organic solvent or mixtures thereof, with high-energy light.

5,587,405

INK COMPOSITIONS

Ban Tanaka, Toyota; Hiroki Nii; Kosaku Yamada, both of Fukuyama; Hideo Kushida, Yachiyo; Takashi Miya, Kamagaya; Shuichi Koshio, Sakura, and Tadashi Hayakawa, Chiba, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, and Hayakawa Rubber Co., Ltd., Hiroshima, both of Japan

Continuation-in-part of Ser. No. 111,571, Aug. 25, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,449

Claims priority, application Japan, Sep. 14, 1992, 4-269146

Int. Cl.[6] C08F *2/48;2/46*

U.S. Cl. 522—98 **27 Claims**

1. A radiation-curable ink composition which comprises a vehicle mixture comprising:

(A) at least one ingredient selected from the group consisting of a linear polyester oligomer substantially free of an acid group and free of a polymerizable double bond on the linear polyester chain, wherein 1 to 10 double bonds are pendent from the linear polyester chain; a linear polyester polymer substantially free of an acid group and free of a polymerizable double bond on the linear polyester chain, wherein 1 to 10 double bonds are pendent from the linear polyester chain; and mixtures thereof,

(B) at least one ingredient selected from the group consisting of a one double bond-containing carboxylic acid wherein the acid has at least one acid group, a carboxylic ester of the said acid, a carboxylic amide of the said acid, and mixtures thereof,

(C) a double bond-containing polycarboxylic ester, wherein 2 to 10 acid groups are present and at least 2 double bonds are pendent from the carboxylic ester having 2 to 10 acid groups,

(D) at least one ingredient selected from the group consisting of a double bond-containing fluorinated carboxylic ester, a block copolymer comprising a fluorinated alkyl group-containing polymer segment and a methacrylic or acrylic polymer segment, a block copolymer comprising a siloxane group-containing polymer segment and a methacrylic or acrylic polymer segment, and mixtures thereof,

(E) a double bond-containing carboxylic ester, having at least 2 double bonds and free of an acid group, provided that it is excluded from the above-mentioned ingredient (A) and

(F) at least one ingredient selected from the group consisting of a one double bond-containing carboxylic ester free of an acid group, a one double bond-containing carboxylic amide free of an acid group, a one double bond-containing carboxylic imide free of an acid group, and mixtures thereof,

wherein the acid value of the vehicle mixture is from 5 to 100.

5,587,406

PRIMER COMPOSITION AND CURABLE COMPOSITION

Takashi Yamamoto; Weiping Zeng; Masami Arata; Tsuyoshi Banba, all of Moriyama, and Harumi Tanaka, Hikone, all of Japan, assignors to Sun Medical Co., Ltd., Moriyama, Japan

Division of Ser. No. 284,175, Aug. 2, 1994, Pat. No. 5,530,038. This application May 25, 1995, Ser. No. 450,992

Claims priority, application Japan, Aug. 2, 1993, 5-191476; Aug. 2, 1993, 5-191477; Aug. 2, 1993, 5-191478

Int. Cl.[6] A61K *6/083;* **C08F** *20/30;* **C08K** *5/08*

U.S. Cl. 523—116 **11 Claims**

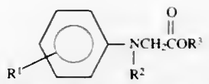
1. A method of treating a tooth surface, which comprises applying a primer composition comprising (A) (a) a polymerizable monomer having an acidic group in its molecule, and (f) a solvent selected from the group consisting of an organic solvent and an aqueous organic solvent to a tooth surface and then applying a curable composition comprising

(A1) (a) a polymerizable monomer having an acidic group in its molecule,

(b) a polymerizable monomer having a hydroxyl group in its molecule,

(c) a polymerization initiator and

an amine compound of formula (I)



(I)

wherein each of R^1 and R^2 is, independently, a hydrogen atom or an alkyl group which may contain a functional group or a substituent, and R^3 is a hydrogen atom or a metal atom, wherein, on the basis of the total amount of components (A1) (a), (b) and (c), the amount of component (A1) (a) is 1 to 50% by weight, the amount of component (b) is 1 to 98.99% by weight, and the amount of the component (c) is 0.01 to 50% by weight, and

wherein the curable composition has a viscosity in the range of from 100 to 30,000 cp when measured at 37.5° C.

5,587,407

BIOCIDAL POLYMERIC COATING FOR HEAT EXCHANGER COILS

Claude E. Terry, LaGrange; Douglas E. Triestman, and Daniel L. Price, both of Kennesaw, all of Ga., assignors to Interface, Inc., LaGrange, Ga.

Division of Ser. No. 864,499, Apr. 7, 1992, Pat. No. 5,453,275, which is a continuation-in-part of Ser. No. 526,394, May 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 242,484, Sep. 9, 1988, Pat. No. 4,957,948. This application Jun. 6, 1995, Ser. No. 467,011

Int. Cl.[6] C08J *3/00;* **C08K** *3/10*

U.S. Cl. 523—122 **24 Claims**

1. A heat exchanger, comprising an exterior coating comprising:

(a) a water resistant organic polymeric material comprising a halogenated polymer, and wherein the material bonds to the surface of the heat exchanger; and

(b) an effective amount of 2-N-octyl-4-isothiazolin- 3-one sufficient to inhibit growth of microorganisms on the heat exchanger.

5,587,408

SOLID ERASABLE MARKING COMPOSITION

Barbara J. Burns, Auburn, and Ralph J. Shuman, Needham, both of Mass., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Sep. 16, 1994, Ser. No. 307,285

Int. Cl.[6] C09D *11/00*

U.S. Cl. 523—160 **12 Claims**

1. A marking composition that is erasable from both porous and non-porous marking substrates, said marking composition comprising:

(a) an emulsion, said emulsion comprising a discontinuous polymeric phase and a continuous aqueous phase, said emulsion being characterized in that, prior to being contacted with the surface of a porous or non-porous marking substrate, said emulsion exists in a stable first state whereas, upon being contacted with the surface of a porous or non-porous marking substrate, said emulsion is transformed into an unstable second state and said discontinuous polymeric phase rapidly agglomerates to form a deposit on the surface of the porous or non-porous marking substrate contacted therewith with low adhesion thereto, said polymeric phase constituting 25–50%, by weight, of the total composition;

(b) a colorant, said colorant being characterized by its association with said deposit when said emulsion is transformed into said second state, said colorant constituting 1–2%, by weight, of the total composition;

(c) a shape-giving gel-forming agent, said shape-giving gel-forming agent being a salt of an aliphatic carboxylic acid having from 8 to 36 carbon atoms, said shape-giving gel-forming agent constituting 10–15%, by weight, of the total composition;

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(d) a tackifier, said tackifier constituting 0–40%, by weight, of the total composition;
(e) a humectant, said humectant constituting 0–6%, by weight, of the total composition;
(f) an antioxidant and/or combination antioxidant and antiozinant, said antioxidant and/or combination antioxidant and antiozinant constituting 0–6%, by weight, of the total composition; and
(g) a fluorochemical surfactant, said fluorochemical surfactant constituting 0–1.5%, by weight, of the total composition.

5,587,409
CURING AGENTS FOR AQUEOUS EPOXY RESIN DISPERSIONS
Dieter Dreischhoff, Wiesbaden; Joerg-Peter Geisler, Ingelheim; Claus Godau, Kiedrich; Michael Hoenel, and Bernhard Stengel-Rutkowski, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany
Division of Ser. No. 192,868, Feb. 7, 1994, Pat. No. 5,539,023. This application Oct. 25, 1995, Ser. No. 548,204
Claims priority, application Germany, Feb. 8, 1993, 43 03 562.0
Int. Cl.⁶ C08K *3/20;* **C08L** *63/02*
U.S. Cl. 523—404 **12 Claims**

1. An aqueous epoxy resin composition comprising an aqueous epoxy resin dispersion and/or water-dilutable poly-functional epoxide compounds and water, and a curing agent obtained by reaction of an adduct (A) of at least one polyepoxide (A_1) and at least one polyalkylene polyether polyol (A_2), with

I. a reaction product of an amine (B) and an epoxide (C)

or

II. an amine (B), and subsequent reaction with an epoxide (C), the amount of amine (B) being chosen that the H atoms on the nitrogen are present in a 2- to 10-fold excess, based on the epoxide groups in (A).

5,587,410
AQUEOUS RESIN COMPOSITION
Kenta Kanaida, Takatsuki, and Kiyoshi Kawamura, Kawanishi, both of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan
Filed Apr. 5, 1995, Ser. No. 417,615
Claims priority, application Japan, Apr. 7, 1994, 6-069383
Int. Cl.⁶ C08L *63/08*
U.S. Cl. 523—410 **7 Claims**

1. An aqueous resin composition comprising:
an aqueous medium;
a polymer (A1) at least partially comprising a polyolefin chloride resin and having a carboxyl group, wherein said polyolefin chloride resin is obtained by chloridizing a polyolefin; and
a polymer (B) having an oxazoline group.

5,587,411
RUBBER COMPOSITION AND METHOD OF PRODUCING RUBBER PRODUCTS USING THE SAME COMPOSITION
Toshiaki Sakaki, Kakogawa, and Shinichi Nakade, Itami, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Nov. 30, 1993, Ser. No. 158,992
Claims priority, application Japan, Dec. 1, 1992, 4-322082
Int. Cl.⁶ C08L *89/00*
U.S. Cl. 524—17 **2 Claims**

1. An unvulcanized rubber composition consisting essentially of 100 parts by weight of rubber latex and 2.5 to 20 parts by weight of unhydrolyzed keratin.

5,587,412
ESTERIFIED STARCH COMPOSITION
Gerd Borchers, Wehr; Ingo Dake, Hamburg; Albrecht Dinkelaker, Rheinfelden, all of Germany; Jean-Pierre Sachetto, Arlesheim, Switzerland; Richard Zdrahala, Montville, N.J.; Stephen Rimsa, Lebanon, N.J.; Gary Loomis, Morris Township, N.J.; Paul Tatarka, Peoria, Ill., and Olivier Mauzac, Seppois-le-Bas, France, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.
PCT No. PCT/US93/02822, § 371 Date Feb. 6, 1995, § 102(e) Date Feb. 6, 1995, PCT Pub. No. WO93/20110, PCT Pub. Date Oct. 14, 1993
Continuation of Ser. No. 948,750, Sep. 22, 1992, abandoned, and a continuation-in-part of Ser. No. 938,107, Aug. 28, 1992, abandoned, and a continuation-in-part of Ser. No. 936,175, Aug. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 860,820, Mar. 31, 1992, abandoned, and a continuation-in-part of Ser. No. 860,914, Mar. 31, 1992, abandoned. This PCT application Mar. 26, 1993, Ser. No. 313,072
Int. Cl.⁶ C08B *33/02*
U.S. Cl. 524—47 **15 Claims**

1. A composition obtained from a melt comprising esterified starch having a degree of substitution of from about 1.8 to about 2.9, wherein the ester group of the esterified starch is selected from the group consisting of C_2 to C_8 ester residues and mixtures thereof.

5,587,413
FLUORINE RUBBER COMPOSITION
Takashi Enokida; Akihiro Naraki; Eiichi Yamashita, all of Kitaibaraki, and Haruyoshi Tatsu, Hitachi, all of Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan
Filed Jan. 5, 1996, Ser. No. 583,642
Claims priority, application Japan, Jan. 13, 1995, 7-021359
Int. Cl.⁶ C08K *5/33;5/205;* **C08L** *27/12*
U.S. Cl. 524—200 **3 Claims**

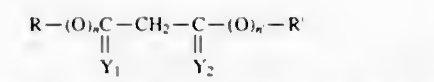
1. A fluorine rubber composition, which comprises a fluorine rubber and a polyfluoroalkyl group-containing block isocyanate compound represented by the following general formula:

$$Rf(CH_2)nXCONHRNHCOO(N=C-R^2)mR^1$$

where Rf is a polyfluoroalkyl group having 4 to 20 carbon atoms; R is a divalent organic group; R^1 is a lower alkyl group or phenyl group; R^2 is a lower alkyl group; X is NH or O; n is an integer of 1 to 4 and m is 0 or 1.

5,587,414
COMPATIBILISING AGENTS
Jan W. Leenslag, Tremelo, and Hans G. G. Verbeke, Linden, both of Belgium, assignors to Imperial Chemical Industries PLC, London, England
Division of Ser. No. 321,507, Oct. 12, 1994, which is a continuation-in-part of Ser. No. 187,577, Jan. 27, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 481,728
Claims priority, application United Kingdom, Nov. 11, 1993, 9323288
Int. Cl.⁶ C08K *5/09;5/098*
U.S. Cl. 524—394 **2 Claims**

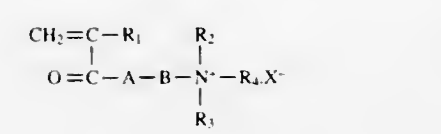
1. A process for solubilizing metal carboxylates in polyisocyanate or polyol compositions comprising: (1) adding to said polyisocyanate or polyol composition a preformed compatibilizing agent which is the reaction product of an organic mono-or polyfunctional isocyanate and a compound corresponding to the following general formula (I):


(I)

wherein Y_1 and Y_2 may be the same or different and represent O or S, n and n' may be the same or different and represent an integer of from 0 to 1, and R and R' may be the same or different and represent an aliphatic hydrocarbon radical containing 1 to 30 carbon atoms, wherein the sum of the total number of carbon atoms of R and R' is between 7 and 40; and (2) adding the metal carboxylate to said polyisocyanate or polyol composition.

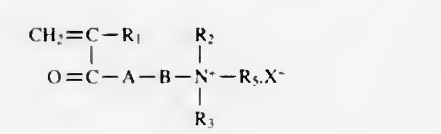
5,587,415
PROCESS FOR PREPARATION OF DISPERSION OF WATER-SOLUBLE CATIONIC POLYMER THE DISPERSION PRODUCED THEREBY AND ITS USE
Hisao Takeda, Zama, Japan, assignor to HYMO Corporation, Japan
Continuation-in-part of Ser. No. 263,536, Jun. 22, 1994, abandoned, which is a continuation of Ser. No. 153,750, Nov. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 921,566, Jul. 29, 1992, abandoned. This application Jul. 14, 1995, Ser. No. 502,613
Claims priority, application Japan, Jul. 30, 1991, 3-211309
Int. Cl.⁶ C08F *2/16*
U.S. Cl. 524—458 **26 Claims**

1. A water-soluble cationic polymer or copolymer dispersion prepared by use of a cationic monomer mixture consisting essentially of 5 to 100% by mole of one or more of cationic monomers represented by the following formula (1):


(1)

wherein A=O or NH; B=CH_2CH_2, $CH_2CH_2CH_2$or $CH_2CHOHCH_2$; R_1=H or CH_3; R_2, R_3=CH_3 or CH_2CH_3; R_4=$(CH_2)_nCH_3$ (wherein n=3 to 9); X^-=anionic counterion, and

0 to 50% by mole of one or more of cationic monomers represented by the following formula (2):


(2)

wherein A=O or NH; B=CH_2CH_2, $CH_2CH_2CH_2$ or $CH_2CHOHCH_2$; R_1=H or CH_3; R_2, R_3=CH_3 or CH_2CH_3; R_5=H, CH_3 or CH_2CH_3(wherein the total carbon atoms of R_2, R_3 and R_5, do not exceed 5), X^-=anionic counterion, and

0 to 95% by mole of (meth)acrylamide, the dispersion being prepared by a process comprising polymerizing or copolymerizing the cationic monomer mixture with stirring in an aqueous salt solution which does not dissolve the resulting polymer or copolymer and in the presence of a dispersant which is a cationic polymer, soluble in the salt solution, said polymer dispersant comprising at least one monomer represented by formula (2) in an amount of more than 20% by mole.

5,587,416
DISPERSIBLE SILICA PARTICULATES AND REINFORCEMENT OF ELASTOMER/RUBBER MATRICES THEREWITH
Yvonick Chevallier, Decines, and Michel Rabeyrin, Dardilly, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France
Division of Ser. No. 341,974, Nov. 16, 1994, and a continuation-in-part of Ser. No. 904,565, Jun. 26, 1992, Pat. No. 5,403,570. This application Jun. 7, 1995, Ser. No. 475,304
Claims priority, application France, Jun. 26, 1991, 91 07859
Int. Cl.⁶ C08K *3/36*
U.S. Cl. 524—492 **8 Claims**

1. An elastomer/rubber matrix having a reinforcing amount of precipitated silica powder homogeneously dispersed therein, the precipitated silica powder having a mean particle size ranging from 5 to 70 microns, a BET specific surface area ranging from 140 to 200 m^2/g, a CTAB specific surface area ranging from 140 to 200 m^2/g, a DOP oil absorption ranging from 180 to 350 ml/100 g, a total pore volume of at least 2.5 cm^3/g and a pore size distribution such that the pore volume provided by pores ranging from 175 to 275 Å in diameter constitutes at least 50% of the pore volume provided by the pore having diameters no greater than 400 Å.

5,587,417
RUBBER COMPOSITION FOR TIRE TREAD
Shinsuke Nakane; Kazuhiko Kanou, and Takatsugu Hashimoto, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
PCT No. PCT/JP93/00971, § 371 Date Mar. 14, 1995, § 102(e) Date Mar. 14, 1995, PCT Pub. No. WO93/19578, PCT Pub. Date Oct. 14, 1993
PCT Filed Jul. 14, 1993, Ser. No. 403,720
Int. Cl.⁶ C08K *3/00*
U.S. Cl. 524—495 **6 Claims**

1. A rubber composition for a tire tread which is obtained by blending 100 parts by weight of a natural rubber and/or a diene synthetic rubber with
40 to 100 parts by weight of a carbon black having characteristic values of a cetyltriammonium bromide adsorption specific surface area (CTAB) being 90 to 220 m^2/g and a 24M4DBP absorption value being 90 to 140 ml/100 g, and
0.1 to 20 parts by weight of an organic unsaturated fatty acid having two or more carbon double bonds in its molecule which includes 35% by weight or more of a conjugated diene acid having at least one conjugated carbon-carbon double bonds in its molecule.

5,587,418
THERMOSETTING COATING COMPOSITION AND COATED BODY
Ryo Sasaki, Atsugi, and Toshiro Ina, Osaka, both of Japan, assignors to Nissan Motor Co., Ltd, Kanagawa, and TBL Co., Ltd., Osaka, both of Japan
PCT No. PCT/JP94/01492, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO95/07320, PCT Pub. Date Mar. 16, 1995
PCT Filed Sep. 9, 1994, Ser. No. 432,140
Claims priority, application Japan, Sep. 10, 1993, 5-249961
Int. Cl.⁶ C08L *51/00;61/28;33/08;23/28*
U.S. Cl. 524—504 **17 Claims**

1. A thermosetting coating composition comprising a graft copolymer obtained by copolymerizing acrylic monomers, unsaturated carboxylic acids, acrylic monomers containing hydroxyl group with chlorinated polyolefin containing anhydride in the

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presence of an organic solvent phase, and melamine resin, which is available for use as a primerless coloured base coat of a 2-coat, 1-bake coating for a polyolefinic substrate.

5,587,419

METHOD FOR THE MANUFACTURE OF WEATHERABLE, RIGID EXTRUSION PROFILES HAVING IMPROVED SURFACE APPEARANCE

Dennis L. Lawson, Brunswick, and Robert E. Detterman, Medina, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 365,338, Dec. 28, 1994, abandoned, which is a continuation of Ser. No. 23,542, Feb. 26, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,745

Int. Cl.[6] C08L *23/28;27/24;* **C08K** *3/34;5/04*

U.S. Cl. 524—527 **22 Claims**

1. An extruded profile having smooth surface appearance made from a chlorinated polyvinyl chloride blend, said blend comprising 100 weight parts of chlorinated polyvinyl chloride containing from 62% to 72% chlorine and 10 to 30 weight parts chlorinated polyethylene, the blend comprising any one of the following:

(a) chlorinated polyvinyl chloride containing 62% to 64% chlorine, said chlorinated polyethylene having a real average molecular weight of from 90,000 to 130,000 and a polydispersity of from 4 to 8, said blend (a) extruded in a shear range of from 100 S^{-1} to 600 S^{-1};

(b) chlorinated polyvinyl chloride containing 64.1% to 66% chlorine, said chlorinated polyethylene having a real average molecular weight of from 90,000 to 130,000 and a polydispersity of from 4 to 8 said blend (b) extruded in a shear range of from 350 S^{-1} to 4,000 S^{-1};

(c) said chlorinated polyvinyl chloride containing 64.1% to 66% chlorine, said chlorinated polyethylene having a chlorine content of from 38% to 44% chlorine, a real average molecular weight of from 170,000 to 220,00 and a polydispersity of from 4 to 8, said blend (c) extruded in a shear range of from 400 S^{-1} to 500 S^{-1};

(d) said chlorinated polyvinyl chloride containing 66.1% to 69% chlorine, said chlorinated polyethylene having a real average molecular weight of from 90,000 to 130,00 and a polydispersity of from 4–8, said blend (d) extruded in a shear range of from 300 S^{-1} to 600 S^{-1};

(e) said chlorinated polyvinyl chloride containing 66.1% to 69% chlorine, said chlorinated polyethylene having a real average molecular weight of from 150,000 to 200,000 and a polydispersity of from 3–8, said blend (e) extruded in a shear range of from 400 S^{-1} to 1,300 S^{-1};

(f) said chlorinated polyvinyl chloride containing 66.1% to 69% chlorine, said chlorinated polyethylene having a real average molecular weight of from 290,000 to 330,000 and a polydispersity of from 8–14, said blend (f) extruded in a shear range of from 500 S^{-1} to 650 S^{-1};

(g) said chlorinated polyvinyl chloride containing from 69.1% to 72% chlorine, said chlorinated polyethylene having a real average molecular weight of from 90,000 to 130,000 and a polydispersity of from 4–8, said blend (g) extruded in a shear range of from 350 S^{-1} to 3,500 S^{-1};

(h) said chlorinated polyvinyl chloride containing from 69.1 to 72% chlorine, said chlorinated polyethylene having a real average molecular weight of from 150,000 to 200,000 and a polydispersity of from 3–8, said blend (h) extruded in a shear range of from 300 S^{-1} to 1,000 S^{-1}; or

(i) said chlorinated polyvinyl chloride containing from 69.1% to 72% chlorine, said chlorinated polyethylene having a real average molecular weight of from 290,000 to 330,000 and a polydispersity of from 8–14, said blend (i) extruded in a shear range of from 350 S^{-1} to 500 S-1.

5,587,420

DIENE POLYMER OBTAINED BY ADDING A TIN COMPOUND IN THE POLYMERIZATION WITH AN ORGANOLITHIUM INITIATOR

Toshiki Takizawa; Yasuo Horikawa, and Taro Akazawa, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 3, 1993, Ser. No. 70,793

Claims priority, application Japan, Jun. 4, 1992, 4-144517; Jun. 4, 1992, 4-144518; Jun. 4, 1992, 4-144519; Sep. 29, 1992, 4-260233; Oct. 22, 1992, 4-284430

Int. Cl.[6] C08L *9/00;* **C08K** *3/04;* **C08F** *4/16;4/48*

U.S. Cl. 524—572 **27 Claims**

1. A method of producing a polymer, comprising the steps of polymerizing a conjugated diene monomer or a mixture of a conjugated diene monomer and a vinylaromatic hydrocarbon monomer in a hydrocarbon solvent using an initiator comprising an organolithium compound and adding an organotin compound during a period of growth of the polymer chain between a time immediately after the start of the polymerization to a time before the end of the polymerization; wherein the organolithium compound is selected from the group consisting of alkyllithium, alkylenedilithium, phenyllithium and stilbenedilithium and the organotin compound is represented by the formula SnR_4, wherein R are the same or different molecular structure groups each having a connecting part to tin selected from the group consisting of a molecular structure containing an allyl group, a molecular structure containing a benzyl group and a molecular structure containing a phenyl group.

19. A high molecular weight polymer, comprising 40% or more of a high molecular weight polymer containing a chain having tin-carbon linkages, the high molecular weight polymer being produced by polymerizing a conjugated diene monomer or a mixture of a conjugated diene monomer and a vinylaromatic hydrocarbon monomer in a hydrocarbon solvent using an initiator comprising an organolithium compound, and adding to the polymerization a halogenated tin compound expressed by the formula SnX'_n, wherein X is a halogen and n is 2, and the halogenated tin compound is added to the polymerization system during a period of growth of the polymer chain between a time immediately after start of the polymerization to a time of 80% conversion in an amount of less than 0.5 to 0.12 or more mol equivalent based on 1 mol equivalent of the lithium at the active end of the polymer.

5,587,421

MIXTURES CONTAINING WATER-EMULSIFIABLE ISOCYANATES

Peter Weyland, Frankenthal; Reinhard Treiber, Leimen; Alwin Sturm, Ludwigshafen; Horst Seibert, Fussgönheim; Hans Renz, Meckenheim; Jürgen Reichert, Ludwigshafen, and Karl Häberle, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 18, 1995, Ser. No. 516,923

Claims priority, application Germany, Aug. 19, 1994, 44 29 446.8

Int. Cl.[6] C08J *3/00;* **C08K** *3/20;* **C08L** *75/00;* **B32B** *27/00*

U.S. Cl. 524—591 **13 Claims**

1. An aqueous polymer emulsion comprising a crosslinkable polymer, and as a crosslinking agent for said polymer, 0.5 to 20% by weight, based on the weight of the polymer, of a mixture

containing a) a water-emulsifiable polyisocyanate containing ionic group or groups convertible into ionic groups or containing hydrophilic nonionic groups, and b) a carbonic ester or lactone as an organic solvent.

5,587,422

SINGLE PHASE SOLIDS CONTAINING METALLOPLOYMERS

Josh H. Golden, Stamford, Conn.; Francis J. DiSalvo, and Jean M. J. Frechet, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 245,574, May 18, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 471,838

Int. Cl.[6] C08K *3/10;3/34*

U.S. Cl. 524—779 **10 Claims**

1. A mixed organic-inorganic solution comprising a homogeneous molecular mixture of a polymerizable organic solvent and an inorganic metallopolymer, wherein the metallopolymer is dissolved in said solvent.

5,587,423

PREPARATION OF BLOCK COPOLYMERS BY IONIC POLYMERIZATION

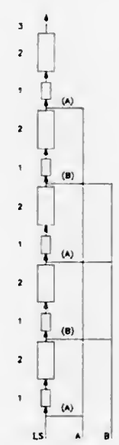
Franz Brandstetter, Neustadt; Hermann Gausepohl, Mutterstadt, and Reiner Thiele, Kaiserslautern, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 13, 1993, Ser. No. 135,406

Claims priority, application Germany, Oct. 14, 1992, 42 34 601.0

Int. Cl.[6] C08F *297/04*

U.S. Cl. 525—52 **6 Claims**



1. A process for preparing block copolymers of styrene and of butadiene by sequential anionic polymerization in a series of at least two sequential tubular reactors, in which a first monomer and an organometallic compound serving as initiator are combined to form a first reaction mixture and are reacted (polymerized) until at least part of said first monomer has been consumed, and then at least one further monomer is added to said reacted first or further mixture and reacted in a subsequent tubular reactor, wherein each tubular reactor is followed by a static mixer or a stirred vessel.

5,587,424

MIXTURE OF FLUOROCARBON RUBBER AND SILICONE/ACRYLATE CORE/SHELL RUBBER

Gerhard Langstein, Kürten; Ralf Krüger, Köln; Karl-Erwin Piejko, Bergisch Gladbach; Ulrich Eisele, Leverkusen, and Leo Morbitzer, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 259,949, Jun. 15, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 456,348

Claims priority, application Germany, Jun. 22, 1993, 43 20 633.6

Int. Cl.[6] C08L *27/12;27/18;27/20*

U.S. Cl. 525—63 **7 Claims**

1. A radically vulcanizable blend of a fluorocarbon rubber and a silicone rubber comprising

a) 2 to 65 parts by weight of silicone-core, acrylate-shell rubber particles dispersed within

b) 98 to 35 parts by weight of a fluorocarbon rubber which is at least partially compatible and radically cross-linkable with the acrylate-shell of said silicone-core, acrylate-shell particles, and

wherein said silicone-core, acrylate-shell particles are themselves comprised of from 50 to 95 parts by weight of a silicone and from 5–50 parts by weight of an acrylate.

5,587,425

BLENDS OF COPOLYMERS OF MONOVINYLARENES AND CONJUGATED DIENES CONTAINING TWO INTERIOR TAPERED BLOCKS

George A. Moczygemba, Bartlesville; Nancy R. Knight, Ochelata; William J. Trepka, and Nathan E. Stacy, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 371,256, Jan. 11, 1995, abandoned, which is a division of Ser. No. 162,735, Dec. 2, 1993, Pat. No. 5,399,638. This application Dec. 28, 1995, Ser. No. 580,227

Int. Cl.[6] C08F *297/04;* **C08L** *25/04;53/02*

U.S. Cl. 525—98 **14 Claims**

1. Blends of at least one polymer of styrene and a copolymer prepared by a method of preparing copolymers under polymerization conditions in a reaction zone comprising:

(a) charging a monovinylaromatic monomer and an initiator and in the presence of a randomizer, allowing polymerization to occur until essentially no free monomer is present; thereafter

(b) charging an initiator and a monovinylaromatic monomer and allowing polymerization to occur until essentially no free monomer is present; thereafter

(c) charging a mixture of monovinylaromatic monomer and conjugated diene monomer and allowing polymerization to occur until essentially no free monomer is present; thereafter

(d) charging a mixture of monovinylaromatic monomer and conjugated diene monomer and allowing polymerization to occur until essentially no free monomer is present; thereafter

(e) charging a conjugated diene monomer and allowing essentially complete polymerization to occur until essentially no free monomer is present; and thereafter

(f) charging reaction mixture with a coupling agent,

wherein only two initiator charges are present and are performed as stated in steps (a) and (b).

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5,587,426

PROCESS FOR PREPARING SELF-CROSSLINKING RESIN

Yoshiyuki Yukawa, Hiratsuka; Motoshi Yabuta, Hadano; Akimasa Nakahata, Hiratsuka, and Yoh Sugimura, Odawara, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Mar. 2, 1993, Ser. No. 24,774

Claims priority, application Japan, Mar. 4, 1992, 4-047189

Int. Cl.[6] C08G *18/62*

U.S. Cl. 525—124 **10 Claims**

1. A process for preparing a self-crosslinking resin having a blocked isocyanate group and a hydroxyl group in the molecule, said process comprising reacting some of the free isocyanate groups of a vinyl polymer (A) having at least two free isocyanate groups in the molecule with some of the hydroxyl groups of an acrylic resin (B) having at least two hydroxyl groups in the molecule, and subsequently reacting a blocking agent with all of the remaining free isocyanate groups.

5,587,427

RESIN COMPOSITION AND PROCESS FOR PRODUCING SAME

Hiroomi Abe, Chiba; Kenji Nagaoka, and Takashi Sanada, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 248,559, May 24, 1994, abandoned, which is a continuation of Ser. No. 131,916, Oct. 4, 1993, abandoned, which is a continuation of Ser. No. 623,501, Dec. 7, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,677

Claims priority, application Japan, Dec. 11, 1989, 1-321148; Dec. 25, 1989, 1-332959; Dec. 25, 1989, 1-332960

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—145 **9 Claims**

1. A process for producing a resin composition which comprises melting and kneading (A) a thermoplastic resin comprising a polyolefin resin together with (B) a functional compound having one or more bonds or one or more functional groups selected from the group consisting of non-aromatic carbon-carbon multiple bonds, oxirane groups and substituted carboxyl groups and subsequently mixing thereinto (C) a polar compound having one or more polar group(s) selected from the group consisting of substituted carboxyl groups, substituted hydroxyl groups, substituted amino groups, substituted mercapto groups, oxazoline groups, isocyanato groups and oxirane groups, provided that at least one of the polar groups is different from at least one of the functional groups of the functional compound (B).

5,587,428

POLYMERIC VEHICLE EFFECTIVE FOR PROVIDING SOLVENTLESS COATING COMPOSITIONS

Frank N. Jones, Ann Arbor, Mich.; Shou-Kuan Fu, Shanghai, China; Jun Hua, Morganville, N.J., and Xiaoying Yuan, Webster, N.Y., assignors to Eastern Michigan University, Ypsilanti, Mich.

Continuation-in-part of Ser. No. 186,430, Jan. 25, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 487,962

Int. Cl.[6] C08G *18/10;* **C08L** *67/02*

U.S. Cl. 525—165 **27 Claims**

1. A polymeric vehicle having at least about 88 weight percent solids which polymeric vehicle is effective for providing a formulated coating composition which formulated coating composition does not require an organic solvent for application to a substrate and is liquid at not more than about 50° C., the polymeric vehicle comprising:

at least one linear oligoester diol having a number average molecular weight in the range of from about 275 to about 1200, a polydispersity index of less than about 2.6 and a viscosity of not more than about 1.2 Pas at from about 20° C. to about 50° C., the oligoester diol having a structure which includes a longitudinal chain, the longitudinal chain having segments, not more than about 3% of the segments comprising segments other than —CH_2—, —O—, —C(=O)—, the oligoester being terminated with hydroxyl groups; and

a crosslinker selected from the group consisting of at least one polyisocyanate and a blend of at least one polyisocyanate and at least one amino resin, the crosslinker has a functionality which is greater than about 2.4, which functionality is reactive with the hydroxyl groups of the oligoester diol and which crosslinker is at least in a stoichiometric amount which will react with the oligoester diol, the crosslinker and oligoester diol forming a blend having a viscosity in the range of from about 0.1 to about 20 Pa.s at about 20° to about 60° C. at a shear of about 1000 $sec.^{-1}$ without the addition of organic solvent, and the crosslinker being soluble in the linear oligoester diol.

5,587,429

PROCESSING AID SYSTEM FOR POLYOLEFINS

Donnan E. Priester, Greenville, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1995, Ser. No. 416,414

Int. Cl.[6] C08L *71/02*

U.S. Cl. 525—187 **9 Claims**

1. A process comprising extruding a composition comprising polyolefin and an effective amount of a processing aid system comprising fluoropolymer processing aid, ionomer, and poly(oxyalkylene) polymer, said fluoropolymer processing aid consisting essentially of hexafluoropropylene/vinylidene fluoride elastomeric copolymer.

5,587,430

ETHYLENE-ACID COPOLYMER AND IONOMER BLENDS HAVING IMPROVED HIGH TEMPERATURE PROPERTIES AND PROCESSIBILITY

Charles J. Talkowski, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 536,403, Sep. 29, 1995, abandoned. This application Dec. 22, 1995, Ser. No. 575,804

Int. Cl.[6] C08L *23/26*

U.S. Cl. 525—196 **7 Claims**

1. An ionomer composition, comprising a blend of:

a) 30–80 weight percent, based on the combined weight of a) plus b), of a first ethylene/carboxylic acid copolymer having from 3 to 13 weight percent acrylic or methacrylic acid, prepared at a polymerization temperature of below 200° C. and a polymerization pressure greater than 23,000 psi the copolymer having a defined DSC melting point of above 100° C., and an MI of from about 0.5 to 60 g/10 min, and

b) 70 to 20 weight percent, based on the combined weight of a) plus b), of an ionomer which is prepared from a second ethylene/carboxylic acid copolymer having from 9 to 25 weight percent of acrylic or methacrylic acid, and optionally up to 40 weight percent of an alkyl acrylate with a C1 to C8 alkyl group, prepared at a polymerization temperature of greater than 200° C., and a polymerization pressure of greater than 23,000 psi, the second acid copolymer having an MI of from 80 to 300, the ionomer prepared by partially neutralizing from above about 40 to about 80 percent of the acid groups with zinc, sodium, lithium, magnesium ions or a combination of any such ions, the resulting ionomer having an MI of from about 3.0 to about 7.0 g/10 min,

the level of neutralization of all acid groups in the blend composition being at least 25 percent, and the MI of the blend being from about 1.5 to about 7.0 g/10 min.

5,587,431

SYNTHESIS OF TERMINALLY UNSATURATED OLIGOMERS

Alexei A. Gridnev, Greenville, and Steven D. Ittel, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1995, Ser. No. 426,517

Int. Cl.[6] C08F *4/80*

U.S. Cl. 525—269 **15 Claims**

2. A method for preparing terminally unsaturated oligomers by free radical polymerization comprising polymerizing a first monomer in the presence of an effective amount of a free radical initiator and metallic chain transfer catalyst to produce a first oligomer composition comprising terminally unsaturated oligomers, followed by subjecting at least a portion of said first composition to further polymerization by again subjecting its terminally unsaturated oligomers to an effective amount of said free radical initiator and a metallic chain transfer catalyst, this time in the presence of a second mononmer, in order to reconvert said terminally unsaturated oligomers to free radicals for further polymerization with said second monomer to produce a block polymer composition.

5,587,432

DISPERSANTS FOR LUBRICATING OIL

Roger Scattergood, Reading, United Kingdom, assignor to Ethyl Petroleum Additives Limited, Bracknell, England

Filed Nov. 30, 1994, Ser. No. 347,767

Int. Cl.[6] C08F *8/32*

U.S. Cl. 525—327.6 **21 Claims**

1. An oil-soluble dispersant obtained by reacting a long chain alkyl or alkenyl succinic acylating agent with an alkoxylated diethylene triamine having an average of from 1 to 2 N-substituted C_2 or C_3 hydroxyalkyl groups per molecule, the reactants being employed in proportions of at least 2 moles of said acylating agent per mole of said alkoxylated diethylene triamine, with the proviso that where said average of N-substituted C_2 or C_3 hydroxyalkyl groups is 1.7 or more, said proportions are such that there are more than 2 moles of said acylating agent per mole of said alkoxylated diethylene triamine.

5,587,433

ESTERS OF HYDROXY TERMINATED POLYBUTADIENE COMPOSITIONS AND METHODS FOR MAKING SAME

Rudolph H. Boeckeler, Grafton, Wis., assignor to Sartomer Company, Inc., Exton, Pa.

Filed Aug. 17, 1995, Ser. No. 516,144

Int. Cl.[6] C08F *36/06*

U.S. Cl. 525—333.2 **44 Claims**

1. A method for producing esters of hydroxy terminated polybutadiene, comprising the steps of:

(a) providing an anhydride;

(b) reacting a hydroxy terminated polybutadiene with the anhydride to form a carboxyl terminated polybutadiene derivative;

(c) reacting the derivative with an epoxide.

5,587,434

PROCESS FOR POLYMER DEGRADATION

James D. McCullough, Jr., Houston, and John F. Bradford, Katy, both of Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 13, 1995, Ser. No. 542,719

Int. Cl.[6] C08F *8/04*

U.S. Cl. 525—333.8 **21 Claims**

1. A continuous process for modifying the melt flow of a polyolefin in a melt mixing device comprising:

feeding said polyolefin into said melt mixing device;

heating said polyolefin in said melt mixing device until at least substantially all of said polyolefin is melted; and

adding a free radical generator to said melt mixing device at a plurality of addition zones;

wherein substantially all of said free radical generator has decomposed before leaving said melt mixing device.

5,587,435

POLYETHERSULFONE/POLYESTER BLOCK COPOLYMERS AND A PROCESS FOR THEIR PREPARATION

Aaron D. Meltzer, Pittsburgh, Pa., and Alexander Karbach, Krefeld, Germany, assignors to Bayer Corporation, Pittsburgh, Pa., and Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 311,621, Sep. 23, 1994, Pat. No. 5,500,479. This application Apr. 21, 1995, Ser. No. 426,769

Int. Cl.[6] C08F *20/00;* **C08G** *75/00*

U.S. Cl. 525—437 **3 Claims**

1. A block copolymer containing structural units conforming to

$$+O-\overset{O}{\overset{\|}{C}}-A-\overset{O}{\overset{\|}{C}}-B\tfrac{1}{n}O-\overset{O}{\overset{\|}{C}}-Z-\overset{O}{\overset{\|}{C}}+O-E_1\tfrac{1}{m}O-E_2\tfrac{1}{m}O-E_1-$$

in which

A and Z independently one of the other denote the residue of a C_6–C_{24} aromatic dicarboxylic acid,

B is the residue of an aliphatic or cycloaliphatic C_2–C_8 diol,

E_2 denotes the residue of a dihalodiaryl sulfone and

E_1 denotes the residue of a aromatic dihydroxy compound, and n and m, independently are integers of about 1 to 100.

5,587,436

PROCESS FOR CONTROLLING THE POLYMERIZATION OF PROPYLENE AND ETHYLENE AND COPOLYMER PRODUCTS

Thaddeus W. Klimek, Orland Park, and Michael B. Edwards, Minooka, both of Ill., assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Continuation of Ser. No. 975,487, Nov. 12, 1992, abandoned. This application Sep. 8, 1994, Ser. No. 302,150

Int. Cl.[6] C08F *2/34*

U.S. Cl. 526—59 **27 Claims**

1. In a gas-phase process for producing copolymers of propylene and ethylene in multiple reactors wherein propylene is copolymerized with a minor amount of ethylene in a first reactor maintained at 50° C. to 100° C. and 250 psig to 650 psig in the presence of a titanium catalyst and organoaluminum cocatalyst and the product produced therein is fed to a second reactor maintained at 25° C. to 80° C. and 100 psig to 500 psig where propylene is copolymerized with a minor amount of ethylene, to obtain copolymers having improved flexibility and physical properties, the improvement comprising

(a) calculating a control parameter Q_c using eight integrated areas of the ^{13}C NMR spectrum corresponding to molecular structural features for copolymers of propylene and ethylene in accordance with the equation

$$Q_c = A/B$$

where

$A = 1.167R_1 + 0.75R_2 + 1.5R_3 + 1.5R_4 + 1.167R_8$

$B = 0.667R_1 + 0.5R_2 + R_5 + R_6 + R_7 + 0.667R_8$ and

R_1 through R_8 have the following peak assignments

R_1 37.9 PPM

R_2 37.5 PPM

R_3 33.2 PPM

R_4 31.2—30.9 PPM

R_5 30.4 PPM

R_6 30.0 PPM

R_7 27.4 PPM

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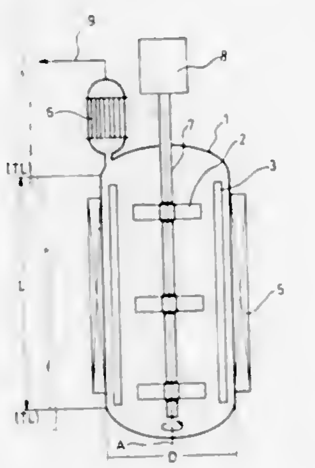
R_8 24.9 PPM
(b) selecting limits for Q_c for the process within the range 0.90 to 1.35.
(c) determining the actual value of the parameter, Q_4, for the copolymer obtained from the second reactor; and
(d) controlling the ethylene feed to maintain Q_4 within the limits selected in (b).

5,587,437
PROCESS OF PRODUCING VINYL CHLORIDE TYPE POLYMER
Fumiaki Adachi; Tadashi Amano; Yoshihrio Shirota, and Yoshitaka Okuno, all of Kamisu-machi, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Sep. 14, 1995, Ser. No. 528,097
Claims priority, application Japan, Sep. 14, 1994, 6-247104
Int. Cl.⁶ C08F *2/18; 14/06*
U.S. Cl. 526—68 **19 Claims**



1. A process of producing a vinyl chloride containing polymer, comprising suspension polymerizing vinyl chloride monomer or a vinyl monomer mixture mainly made up of vinyl chloride monomer in an aqueous medium in the presence of an oil-soluble polymerization initiator in a polymerization apparatus which comprises (a) a cylindrical polymerization vessel constructed of a cylindrical straight barrel, a semispherical top part and a semispherical bottom part, which parts close the top and bottom of the straight barrel respectively, (b) stirring impellers, each having impeller blades, tiered along a rotating shaft arranged on the center line of said polymerization vessel, (c) a reflux condenser arranged at the upper part of said polymerization vessel for condensing monomer vapor generated in said polymerization vessel and flowing back the resulting condensate into said polymerization vessel, and (d) a heating and cooling jacket arranged around said polymerization vessel for heating and cooling liquid contents of said polymerization vessel, while stirring said vinyl chloride monomer or said vinyl monomer mixture by said stirring impellers and evacuating noncondensable gases evaporated from said contents, wherein said polymerization apparatus is such a polymerization apparatus that the inner volume of the polymerization vessel is 100 m^3 or more, the ratio L/D of the length L of the straight barrel to the inner diameter D of the polymerization vessel is 1.5 or more, and an uppermost stirring impeller is arranged such that the height of a center line of the vertical width of its impeller blade is in the range of 150 to 300 cm downwardly from the upper end position of the straight barrel of the polymerization vessel, wherein after the contents in the polymerization vessel are heated to an intended polymerization temperature or a temperature near said polymerization temperature, the noncondensable gases coming into the reflux condenser are evacuated under such conditions that a flow rate of the evacuation is 10 to 100 Nm^3/hour and the evacuation time is a period equal to 20% or more of the total polymerization time, and wherein simultaneously with or after the start of the evacuation of the noncondensable gases, cooling by the reflux condenser is started, and
wherein materials to be charged into the polymerization vessel are charged such that both the relations:

$$\frac{10}{9} H_1 \leq H_0 \leq \frac{100}{65} H_1 \text{ and } H_0 < H_2,$$

wherein H_0 denotes the height of the liquid surface of the contents that have not yet been reacted, H_1 denotes the height of an upper edge of the impeller blade of the upper most stirring impeller, and H_2 denotes the height of an upper end of the straight barrel are simultaneously satisfied.

5,587,438
PROCESS FOR PREPARING STYRENE POLYMERS
Frederik L. Binsbergen; Alouisius N. R. Bos, and Augustinus Santen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed May 31, 1995, Ser. No. 455,371
Int. Cl.⁶ C08F *2/02; 12/08*
U.S. Cl. 526—88 **17 Claims**

1. A process for preparing polymers, comprising the step of bulk polymerizing in a spray-tower reactor, in the presence of an anionic initiator, and in the absence of a quenching solvent, a monomer feedstock comprising one or more monomers selected from the group consisting of styrene, vinylarene compounds, vinyl-substituted vinylarene compounds, and aryl-substituted vinylarene compounds.

5,587,439
POLYMER SUPPORTED CATALYST FOR OLEFIN POLYMERIZATION
Anthony-J. DiMaio, Maineville, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio
Filed May 12, 1995, Ser. No. 439,810
Int. Cl.⁶ C08F *4/629; 4/637; 10/00*
U.S. Cl. 526—142 **40 Claims**

1. A supported metallocene catalyst useful for polymerizing olefins comprising the product which is prepared by the steps of:
(a) reacting a particulate olefin copolymer support which comprises discrete particles having a median particle size ranging from about 1 up to about 1500 microns, a pore volume of less than 0.1 cc/g and a surface area of less than about 15 m^2/g, wherein said olefin copolymer has a melt index of from about 0.1 to about 400 and includes from about 50.1 to about 99.9 weight percent C_{2-3} α-olefin and from about 0.1 to about 49.9 weight percent of an acrylate, with a metallated compound, wherein said metallated compound is selected from the group consisting of a substituted or unsubstituted cyclopentadienylide, a substituted or unsubstituted indenylide and a substituted or unsubstituted fluorenylide compound and contains a metal of Groups I-III of the Periodic Table of Elements, under conditions sufficient to form a metallated keto-intermediate;
(b) contacting said metallated keto-intermediate of step (a) with a transition metal compound having the formula

$$(Cp)_a MR''_b X_c$$

wherein Cp is a substituted or unsubstituted cyclopentadienyl, indenyl or fluorenyl ring; M is a metal of Group IVB, VB and VIB of the Periodic Table of Elements; R" is a hydride, a hydrocarbyl group having from about 1 to about 20 carbon atoms, an alkoxy group having from about 1 to about 12 carbon atoms, a substituted or unsubstituted aryl group containing from about 6 to about 12 carbon atoms, or NR"', wherein R"' is an alkyl containing from about 1 to about 12 carbon atoms; X is a halide; a is 0 or 1; b is 0–4; c is 0–4; and the sum of a, b and c is equal to the oxidation state of M; and
(c) recovering said contact product of step (b).

5,587,440
PROCESS FOR THE PREPARATION OF ULTRAHIGH MOLECULAR WEIGHT POLYETHYLENE HAVING A HIGH BULK DENSITY
Jens Ehlers, Oberhausen, and Jutta Walter, Neukirchen-Vluyn, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany
Continuation of Ser. No. 309,429, Sep. 20, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 605,466
Claims priority, application Germany, Sep. 27, 1993, 43 32 786.9
Int. Cl.⁶ C08F *4/655; 10/02*
U.S. Cl. 526—153 **12 Claims**

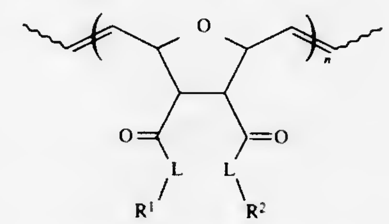
1. A process for the preparation of pulverulent polyethylenes having viscometrically measured molecular weights of at least 10^6 g/mol and bulk densities of 430 to 460 g/liter by polymerization of ethylene at polymerization temperatures of 30° to 130° C. and pressures of 0.05 to 4 MPa in the presence of a mixed catalyst and a molecular weight regulator,
said mixed catalyst comprising a titanium component and an activator, said titanium component being produced by a reaction having a first stage and a second stage,
in said first stage, a Ti(IV) compound of the formula $Ti(OR^1)_{4-n}X_n$ wherein n is an integer from 1 to 4, the R^1's are independently hydrocarbon radicals and X is halogen, is reacted with a first organoaluminum compound which is selected from the group consisting of organoaluminum compounds having the formula AlR^23, wherein the R^2's are independently alkyl radicals having 1 to 12 carbon atoms, and polymeric organoaluminum compounds which are obtained from the reaction of lithium aluminum hydride, trialkylaluminum, or dialkylaluminum hydrides, the alkyl radicals of which each have 1 to 16 carbon atoms, with diolefins having 4 to 20 carbon atoms, at −40° C. to 140° C. in a first molar ratio of titanium to aluminum of 1:0.1 to 1:0.6 to form a titanium (III) compound as a first reaction product and
in a second stage, said first reaction product is aftertreated with isoprenylaluminum as second organoaluminum compound at −10° to 150° C. in a second molar ratio of titanium to aluminum of 1:0.4 to 1:5, thereby forming said titanium component, and forming said titanium component into said mixed catalyst by adding said activator, which is a third aluminum compound selected from the group consisting of triisobutylaluminum, isoprenylaluminum, and mixtures thereof in a third a molar ratio of titanium in said Ti (IV) compound to aluminum in said third aluminum compound of 1:1 to 1:15.

5,587,441
HYPERBRANCHED POLYMERS FROM AB MONOMERS
Jean M. J. Frechet, Ithaca, N.Y., and Sadahito Aoshima, Chiba, Japan, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Nov. 8, 1994, Ser. No. 335,947
Int. Cl.⁶ C08F *4/14; 16/12*
U.S. Cl. 526—238 **36 Claims**

1. A process for the preparation of a hyperbranched polymer comprising initiating polymerization of and thereafter polymerizing in a single polymerization an AB monomer in which A and B are reactive groups that react independently of each other in which group A is a polymerizable group that is polymerized by opening of a double bond or ring and group B is a precursor of a moiety which initiates the polymerization of A as a result of being activated.

5,587,442
POLYGLYCOMERS
Laura L. Kiessling, 2320 Lakeland Ave., Madison, Wis. 53704; David D. Manning, 1906 Pike Dr., Apt. 1, Madison, Wis. 53713, and Kathleen H. Mortell, 202 G Eagle Heights, Madison, Wis. 53705
Filed Dec. 23, 1994, Ser. No. 363,503
Int. Cl.⁶ A01N *43/04;* **A61K** *31/70*
U.S. Cl. 526—238.2 **16 Claims**

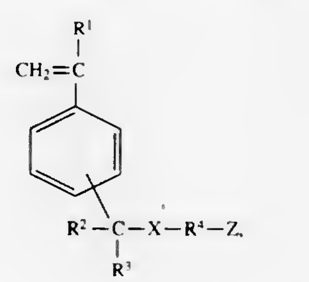
1. A polyglycomer of the formula



wherein L is a linker selected from the group of $—O—(CH_2)_m—$, $—NH—(CH_2)_m—$, $—O—(CH_2)_m—X—$, and $—NH—(CH_2)_m—X—$, wherein X is S or O and m is 2–10,
wherein R^1 and R^2 are selected from the group consisting of monosaccharides, disaccharides, trisaccharides, and oligosaccharides, and
wherein n is between 1 and 2000.

5,587,443
POLYMERIZABLE EMULSIFIERS AND REACTIVE GROUPS AND POLYMERS OF EMULSIFIERS AND OTHER MONOMERS
Ludger Heiliger, Leverkusen; Adolf Schmidt, Cologne, and Joachim Probst, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Division of Ser. No. 3,641, Jan. 13, 1993, Pat. No. 5,380,924. This application Aug. 8, 1994, Ser. No. 287,164
Claims priority, application Germany, Jan. 25, 1992, 42 02 050.6
Int. Cl.⁶ C08F *30/04*
U.S. Cl. 526—240 **3 Claims**

1. A polymer comprising at least one compound corresponding to formula (I):



(I)

in which
X is NH—CO—Y or Y,
Y is NH, oxygen or sulfur,
Z is COOM or SO_3M,
M is hydrogen, sodium, ammonium or potassium.

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R^1, R^2 and R^3 independently of one another represent hydrogen or methyl and

R^4 is C_{1-12} alkylene, C_{3-12} cycloalkylene, phenylene or naphthylene, and the polymer contains at least one additional monomer.

5,587,444

COPOLYMER, A PROCESS FOR PRODUCING THE SAME AND AN ELECTROLUMINESCENT ELEMENT USING THE SAME

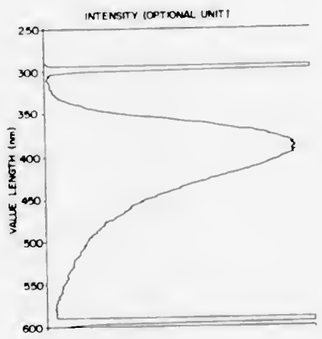
Manabu Uchida; Takenori Izumizawa, and Kenji Furukawa, all of Kanagawa-ken, Japan, assignors to Chisso Corporation, Osaka-fu, Japan

Filed Dec. 27, 1994, Ser. No. 364,894

Claims priority, application Japan, Dec. 27, 1993, 5-354192

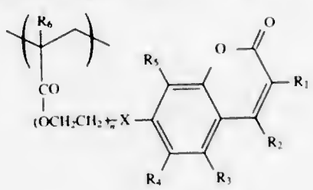
Int. Cl.[6] H01J *1/62*

U.S. Cl. 526—247 **2 Claims**

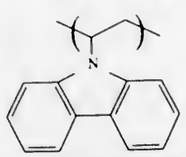


1. A copolymer consisting of repetition units expressed by the formula (1) and repetition units expressed by the formula (2), the content of the repetition units (1) in the total repetition units being 0.01 to 50% by mol, and the weight average molecular weight calculated in terms of polystyrene measured according to gel permeation chromatography being 1,000 to 1,000,000:

(1)



(2)



in the formula (1), R_1 to R_5 each independently being chosen from the group consisting of hydrogen, fluorine, alkyl group, alkoxy group, dialkylamino group, alkanoyloxy group, alkyloxycarbonyl group, aryl group, cyano group, alkanoyl group or trifluoromethyl group; X representing O or NY (wherein Y represents hydrogen, alkyl group or aryl group); n representing 1 or 2; and R_6 representing hydrogen or methyl group.

5,587,445

HIGHLY OXYGEN-PERMEABLE HEAT-RESISTANT MATERIAL

Shigeo Mochizuki; Masahiro Matsumoto, both of Nagoya; Toshio Yamazaki, and Shoji Ichinohe, both of Gunma-ken, all of Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Jan. 18, 1996, Ser. No. 588,388

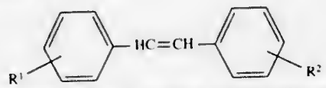
Claims priority, application Japan, Jan. 20, 1995, 7-007536

Int. Cl.[6] C08F *34/02*

U.S. Cl. 526—271 **7 Claims**

1. A highly oxygen-permeable heat-resistant material consisting essentially of a polymer obtained by polymerizing a polymerizable component containing a silicon-containing stilbene derivative of the formula (I):

(I)



wherein each of R^1 and R^2 which are independent of each other, is a hydrogen atom or a group of the formula (II):

$$-Si_pO_{p-1}(CH_3)_{2p+1} \quad \text{(II)}$$

wherein p is an integer of from 1 to 8, provided that at least one of R^1 and R^2 is the group of the formula (II).

5,587,446

HYPERBRANCHED POLYMERS FROM AB MONOMERS

Jean M. J. Frechet, Ithaca, N.Y., and Sadahito Aoshima, Kashiwa, Japan, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 335,947, Nov. 8, 1994. This application Jun. 1, 1995, Ser. No. 456,540

Int. Cl.[6] C08F *16/12;4/14*

U.S. Cl. 526—333 **8 Claims**

1. A hyperbranched polymer produced from an AB monomer in which A and B are reactive groups that react independently of each other in which group A is a polymerizable group and group B is a precursor of a moiety B* which initiates the polymerization of A as a result of being activated, wherein said hyperbranched polymer comprises an AB^*_x macro-monomer in which x is an integer that increases as polymerization increases, said hyperbranched polymers having a living character in that said polymer has active sites A* and B* which are reactable with A groups, AB monomers and nucleophiles.

5,587,447

COPOLYAMIDE PRODUCTION METHOD

Masahiro Harada, and Yasuo Inaba, both of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Apr. 5, 1995, Ser. No. 417,118

Claims priority, application Japan, Apr. 7, 1994, 6-069415

Int. Cl.[6] C08G *69/28*

U.S. Cl. 528—347 **6 Claims**

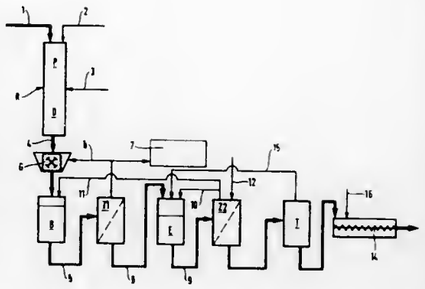
1. A method for producing a copolyamide which comprises the steps of:

(1) heating either one dicarboxylic acid selected from the group consisting of adipic acid and a mixture comprising 40 mol % or more of adipic acid and 60 mol % or less of dicarboxylic acid other than adipic acid to a temperature higher than the melting point of adipic acid but lower than a temperature lower by 30° C. than the melting point of the resulting copolyamide,

(2) dropping a diamine comprising 35 to 70 mol % of paraxylylene diamine and 65 to 30 mol % of metaxylylene diamine into the heated dicarboxylic acid stepwise or continuously before a conversion of the dicarboxylic acid reaches 90 mol %,

(3) discontinuing the dropping of the diamine before the conversion of the dicarboxylic acid reaches 90 mol %, and dropping metaxylylene diamine or a diamine mixture of 70 mol % or more of metaxylylene diamine and 30 mol % or less of paraxylylene diamine in place of the diamine continuously or stepwise until a molar ratio of the total of the diamines to the total of the dicarboxylic acids becomes 0.97 to 1.03, and

(4) heating a reaction system to a temperature higher than a temperature lower by 30° C. than the melting point of the finally formed copolyamide before the conversion of the dicarboxylic acid reaches 95 mol %, and elevating the temperature of the reaction system to a temperature higher than the melting point of the finally formed copolyamide upon termination of dropping the diamine.



5,587,448

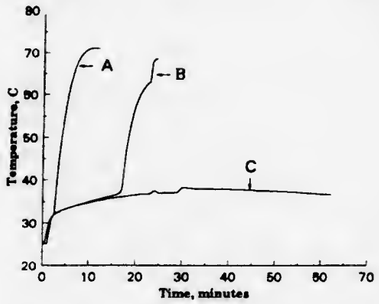
REACTION SYSTEM FOR PRODUCING A POLYURETHANE AND METHOD OF USING SAME TO SEAL A SURFACE

Paul T. Engen, Martell Township, Pierce County, Wis., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Dec. 29, 1994, Ser. No. 366,308

Int. Cl.[6] C08G *18/08;18/22*

U.S. Cl. 528—55 **28 Claims**



1. A two-part reaction system for producing a polyurethane having an isocyanate index of at least 100 and having a gel time between 5 and 60 minutes after admixture of said two parts, comprising first and second parts located in separate first and second containers, respectively, effective to prevent contact between said first and second parts thereof,

(a) said first part comprising a polyisocyanate component;

(b) said second part comprising

(i) a polyol component;

(ii) a polyurethane catalyst comprising a bismuth/zinc polyurethane catalyst; and

(iii) a molar excess of a complexing agent for said polyurethane catalyst, wherein said complexing agent comprises a mercaptan compound.

5,587,449

PROCESS FOR THE PREPARATION OF POLYACETAL COPOLYMERS

Dietrich Fleischer, Darmstadt; Michael Hoffmockel, Niedernhausen; Karl-Friedrich Mück, and Günter Sextro, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Aug. 31, 1995, Ser. No. 521,998

Claims priority, application Germany, Sep. 5, 1994, 44 31 575.9

Int. Cl.[6] C08G *4/00*

U.S. Cl. 528—232 **18 Claims**

1. In a process for the preparation and simultaneous end group stabilization of a polyacetal copolymer in a homogeneous phase, in which a cyclic formaldehyde oligomer is copolymerized with a cyclic acetal in the presence of an initiator in a polymerization reactor and immediately thereafter the initiator is deactivated by addition of a basic substance, which comprises a procedure in which the unstable chain ends are degraded down to 0.01% to 1% in the presence of residual monomer, the improvement according to which the product spontaneously solidifies due to evaporation of the residual monomer at the reactor outlet by letting down into a pelletizing device and the residual monomer which remains and the impurities dissolved in the product are removed by extraction with a solvent and the product is pelletized, after drying and stabilization.

5,587,450

PROCESS FOR PRODUCING AROMATIC POLYAMIDE FILM

Kazunori Akiyoshi, and Masahiro Niwano, Tsukuba, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 30, 1995, Ser. No. 496,878

Claims priority, application Japan, Jul. 8, 1994, 6-157399

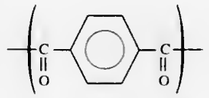
Int. Cl.[6] C08G *69/08;73/10*

U.S. Cl. 528—310 **18 Claims**

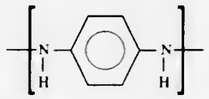
1. A process for producing an aromatic polyamide film having an excellent transparency, which comprises the steps of:

(a) forming a thin layer of an optically isotropic dope in which an aromatic polyamide selected from an aromatic polyamide composed of the following recurring structural units (A) and (B):

(A)



(B)



is dissolved in a polar amide,

(b) immersing the thin layer dope in a polar solvent, other than said polar amide, kept at a temperature not higher than −20° C. to prepare a film, and

(c) drying the film.

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5,587,451

PROCESS FOR PREPARING POLYAZAMACROCYCLES

Phillip S. Athey, and Garry E. Kiefer, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

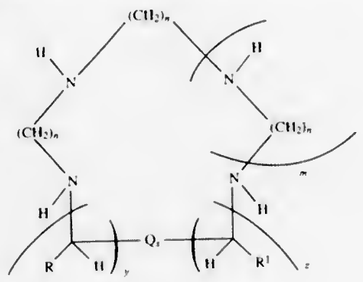
Continuation-in-part of Ser. No. 158,654, Nov. 26, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,620

Int. Cl.[6] C08G *69/26*

U.S. Cl. 528—345 **30 Claims**

1. A process for preparing polyazamacrocycle compounds of the formula

(1)



wherein:

each n is independently 2 or 3;

m is 0 or an integer from 1 to 3;

s is 0 or 1;

y is 0 or 1;

z is 0 or 1;

with the proviso that at least 2 of s, y, and z must be 1;

Q is —CH_2—, —C(O)— or —CHR;

R is hydrogen, C_1–C_6 alkyl, —CO_2H, —CO_2(C_1–C_6 alkyl) or phenyl;

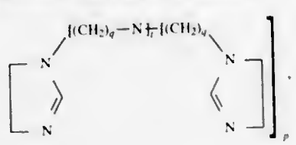
R^1 is hydrogen, —CO_2H, —CO_2(C_1–C_6 alkyl), C_1–C_6 alkyl, C_1–C_6 alkyl substituted by NH_2, NO_2, isothiocyanato, semicarbazido, thiosemicarbazido, maleimido, bromoacetamido or OR^2, phenyl or phenyl substituted by NH_2, NO_2, isothiocyanato, semicarbazido, thiosemicarbazido, maleimido, bromoacetamido or OR^2; or

R and R^1 can be taken together to form a phenyl or phenyl substituted by NH_2, NO_2, isothiocyanato, semicarbazido, thiosemicarbazido, maleimido, bromoacetamido or OR^2; and

R^2 is hydrogen or C_1–C_4 alkyl;

which comprises reacting an alkylenepolyamine with a formyl equivalent, either neat or in a nonaqueous solvent, to form the unsubstituted imidazoline of the formula

(9)



wherein

q is independently 2 or 3;

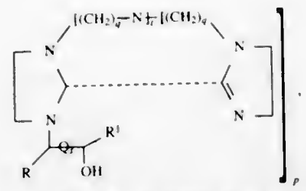
p is 0 or 1;

t is 0, 1 or 2; and

followed by reacting (9) with:

(A) 1 equivalent of an ethylene oxide or an ethylene carbonate, in an aprotic solvent, to form an alcohol (16) of the formula

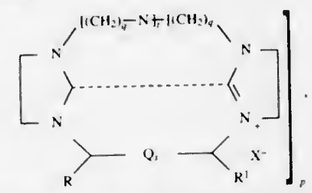
(16)



wherein Q, s, R and R^1 are defined as for Formula (I) and the dotted line represents the optional presence of a bond; when the bond is present, then t is 0, q is 2 to 3, and p is 1; when the bond is absent, then when t is 0, q is 4 or more and p is 1, when t is 1 or more, q is 2 or more and p is 1;

followed by intramolecular amination to yield (17) of the formula

(17)

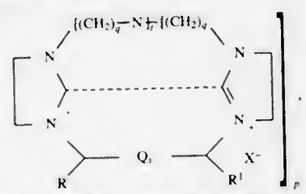


wherein the various terms are defined as for (16) and X is an anion, e.g., a halide ion;

and then either basic or acidic hydrolysis to form a compound of Formula (I); or

(B) an electrophilic substrate, in a polar solvent, optionally in the presence of a non-nucleophilic base, to form a salt (17)) of the formula

(17)



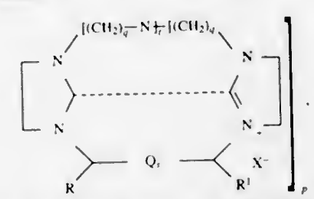
wherein Q, s, R and R^1 are defined as for Formula (I), X is an anion, and the dotted line represents the presence of a bond, t is 0, q is 2 to 3, and p is 1;

and then basic hydrolysis to form a compound of Formula (I); or

and then basic hydrolysis to form a compound of Formula (I); or

(C) an electrophilic substrate, in a polar solvent, optionally in the presence of a non-nucleophilic base, to form (17) of the formula

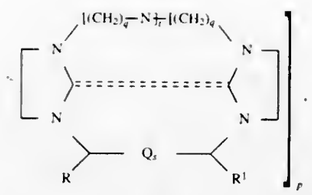
(17)



wherein Q, s, R and R^1 are defined as for Formula (I), X is an anion, and the dotted line represents the presence of a bond, t is 0, q is 2 to 3, and p is 1;

followed by prolonged heating in a polar solvent or by treatent with a peroxide solution to form (18) of the formula

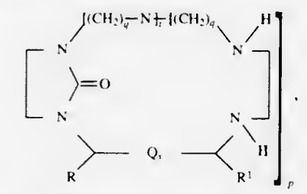
(18)



wherein Q, s, R and R^1 are defined as for Formula (I) and the dotted lines represent the presence of a double bond, t is 0, q is 2 to 3, and p is 1;

followed by basic hydrolysis to form the urea (19) of the formula

(19)



wherein Q, s, R and R^1 are defined as for Formula (I) and t is 0, q is 2 to 3, and p is 1;

then basic hydrolysis under pressure to form a compound of Formula (I); and

separating the desired polyazamacrocycle.

5,587,452

POLYAMIDE-IMIDE

Cornelis E. Koning, Schinnen, Netherlands, and Lilian M. J. Teuwen, Maaseik, Belgium, assignors to DSM N.V., Netherlands

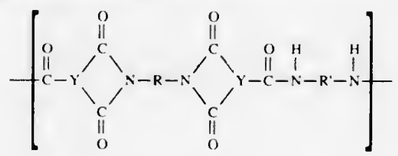
Filed Jul. 3, 1995, Ser. No. 498,278

Claims priority, application Belgium, Jul. 11, 1994, 09400643

Int. Cl.[6] C08G *73/14*

U.S. Cl. 528—350 **18 Claims**

1. A semi-crystalline polyamide-imide containing recurring units represented by the formula



wherein said formula

Y represents an arylene group, and

R and R' are alkylene groups,

and wherein at least 50 mole % of at least one of R or R' is a linear butylene group.

5,587,453

PROCESS FOR PURIFYING METHACRYLATE

Takafumi Abe; Mitsuhiro Nishikawa, and Susumu Naitoh, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 1, 1995, Ser. No. 381,740

Claims priority, application Japan, Feb. 25, 1994, 6-028191; Mar. 25, 1994, 6-055788; Mar. 25, 1994, 6-055789; Apr. 7, 1994, 6-069416

Int. Cl.[6] C08F *6/24*

U.S. Cl. 528—488 **20 Claims**

1. A process for purifying a methacrylate which comprises contacting the methacrylate with at least one treating agent selected from the group consisting of (a) an oximating agent comprising at least one compound selected from the group consisting of hydroxylamine and a mineral acid salt thereof and (b) an aqueous alkali solution, and then separating and collecting the resultant purified methacrylate.

5,587,454

OMEGA CONOPEPTIDE COMPOSITIONS

Alan Justice, Sunnyvale; Tejinder Singh, Palo Alto; Kishor C. Gohil, Richmond; Karen L. Valentino, San Carlos, and George P. Miljanich, Redwood City, all of Calif., assignors to Neurex Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 814,759, Dec. 30, 1991, abandoned. This application Apr. 15, 1993, Ser. No. 49,794

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 530—324 **3 Claims**

1. An omega conopeptide having the sequence: SEQ ID NO: 30 (SNX-236).

5,587,455

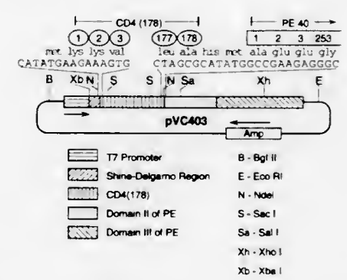
CYTOTOXIC AGENT AGAINST SPECIFIC VIRUS INFECTION

Edward A. Berger, Rockville; Bernard Moss, Bethesda; Thomas R. Fuerst, Gaithersburg; Ira Pastan, Potomac; David Fitzgerald, Rockville, all of Md.; Tamio Mizukami, Machida, Japan, and Vijay K. Chaudhary, New Delhi, Ind., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 22,182, Feb. 25, 1993, abandoned, which is a division of Ser. No. 223,270, Jul. 22, 1988, Pat. No. 5,206,353. This application Nov. 8, 1994, Ser. No. 335,669

Int. Cl.[6] C07K *14/21;14/73*

U.S. Cl. 530—324 **8 Claims**



1. A hybrid protein comprising a virus binding region from a cellular receptor sequence linked to a protein toxin sequence containing a region essential for cell toxicity, wherein said cellular receptor sequence is CD4.

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5,587,456

HYDROPHOBIC ATTACHMENT SITE FOR ADHESION PEPTIDES

Michael D. Pierschbacher, San Diego; Cyril J. Honsik, La Jolla, and Lisa B. Dreishach, Cardiff, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 787,318, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 326,168, Mar. 20, 1989, Pat. No. 5,120,829. This application Aug. 20, 1992, Ser. No. 932,929

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00*

U.S. Cl. 530—326 5 Claims

1. A substantially pure active adhesion peptide comprising a cell attachment promoting binding site containing (D-)RGD and a hydrophobic attachment domain having hydrophobicity between that exhibited by the amino acid sequence L_4 and that exhibited by the amino acid sequence L_6, wherein said substantially pure active adhesion peptide, when adsorbed to a solid surface, can cause the attachment of cells to the solid surface.

5,587,457

NEUTROPHIL STIMULATING PEPTIDES

Deborah A. Rathjen, Thornleigh, and Antonio Ferrante, Mount Osmond, both of Australia, assignors to Peptide Technology Limited, Australia

Continuation-in-part of Ser. No. 930,415, Nov. 9, 1992, abandoned. This application Aug. 16, 1993, Ser. No. 107,235

Claims priority, application Australia, Mar. 12, 1990, PJ9065

Int. Cl.[6] A61K *38/00;37/02;* C07K *7/06;14/00*

U.S. Cl. 530—326 6 Claims

1. A peptide having the formula: Leu-Phe-Lys-Gly-Gln-Gly-Cys-Pro-Ser-Thr-His-Val-Leu-Leu-Thr-His-Thr-Ile-Ser-Arg-Ile (SEQ ID NO.:6).

5,587,458

ANTI-ERBB-2 ANTIBODIES, COMBINATIONS THEREOF, AND THERAPEUTIC AND DIAGNOSTIC USES THEREOF

C. Richter King; Philip G. Kasprzyk, both of Washington, D.C., and Robert E. Bird, Rockville, Md., assignors to Aronex Pharmaceuticals, Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 906,555, Jun. 30, 1992, which is a continuation-in-part of Ser. No. 772,270, Oct. 7, 1991, abandoned. This application May 14, 1993, Ser. No. 61,092

Int. Cl.[6] C07K *16/00;16/46;16/28*

U.S. Cl. 530—387.3 12 Claims

1. A single chain antibody which binds to erbB-2 which comprises the variable heavy and light domains of a monoclonal antibody selected from the group consisting of e21 having ATCC Accession No. HB11602 and e23 having ATCC Accession No. HB11601.

5,587,459

IMMUNOCONJUGATES COMPRISING TYROSINE KINASE INHIBITORS

Fatih M. Uckun, White Bear Lake, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 19, 1994, Ser. No. 293,731

Int. Cl.[6] C07K *16/28*

U.S. Cl. 530—391.1 4 Claims

1. An immunoconjugate comprising genistein linked to an anti-CD19 antibody which specifically binds to cell surface CD19 receptor, wherein said immunoconjugate inhibits CD19 associated tyrosine kinase, thereby inducing apoptosis and cell death.

5,587,460

14-BETA-GAL MAMMALIAN LECTINS

Glenn E. Nedwin, Half Moon Bay; Timothy S. Bringman, Burlingame, all of Calif., and Pierre-Oliver Couraud, Leperray, France, assignors to Incyte Pharmaceutical Corporation, Palo Alto, Calif.

Continuation of Ser. No. 313,649, Feb. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,734, Oct. 28, 1988, which is a continuation-in-part of Ser. No. 181,747, Apr. 14, 1988, abandoned. This application Aug. 5, 1994, Ser. No. 286,807

Int. Cl.[6] C07K *14/435;* C08G *69/26;* C12N *15/00*

U.S. Cl. 530—396 1 Claim

1. A human HL-60 lectin in purified and isolated form, said lectin having an amino acid sequence consisting of positions 2–135 in FIG. 1A; and

having a molecular weight of about 14 kd,

wherein said human HL-60 lectin is homogeneous

using the criterion of producing a single peak when subjected to C4-HPLC, capable of binding to asialofetuin and trypsinized rabbit erythrocytes and wherein agglutination of said lectin is inhibited by thiodigalactoside and beta-lactose.

5,587,461

AROMATIC ACIDS

Jui Y. Chang, Bubendorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

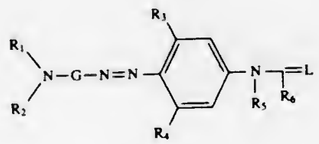
Division of Ser. No. 255,298, Jun. 7, 1994, Pat. No. 5,382,659, which is a continuation of Ser. No. 56,725, May 3, 1993, abandoned, which is a division of Ser. No. 758,249, Sep. 11, 1991, Pat. No. 5,229,503, which is a continuation of Ser. No. 348,315, May 5, 1989, abandoned. This application Sep. 30, 1994, Ser. No. 316,268

Claims priority, application Switzerland, May 10, 1988, 1766/88; Mar. 22, 1989, 1065/89

Int. Cl.[6] C07K *1/107*

U.S. Cl. 530—404 6 Claims

1. A process for the chemical modification of a protein comprising the conversion of an amino group in the ε-position of a lysine building block of the protein to a carbamoyl or a thiocarbamoyl, or the conversion of a mercapto group of a cysteine building block of the protein into a carbonylmethylthio group, wherein the protein is reacted with a compound of formula I



(I)

wherein

R_1 is lower alkyl;

R_2 is lower alkyl;

lower is 1–7 carbon atoms;

R_3 is hydrogen, carboxy, or sulfo;

R_4 is carboxy or sulfo;

G is a 1,4-phenylene group which is unsubstituted or is substituted by 1–4 substituents selected from carboxy and sulfo or G is a 1,4-naphthylene group which is unsubstituted or substituted by 1–6 substituents selected from carboxy and sulfo; and

wherein R_5 and R_6 together are an additional bond; and

L is an oxygen atom or a sulfur atom; or

wherein R_5 is hydrogen;

R_6 is halomethyl; and

L is an oxygen atom,

or a salt thereof.

5,587,462

BRAIN-DERIVED MEMBRANE-ASSOCIATED CRF BINDING PROTEINS

Dominic P. Behan, San Diego; Wylie W. Vale, Jr., La Jolla; Wolfgang H. Fischer, Encinitas, all of Calif., and Philip J. Lowry, Reading, England, assignors to The Salk Institute For Biological Studies, LaJolla, Calif.

Filed Nov. 8, 1993, Ser. No. 149,091

Int. Cl.[6] C07K *14/705;14/695*

U.S. Cl. 530—350 11 Claims

5. An isolated, substantially pure CRF-binding protein which exhibits affinity to CRF and which has a molecular weight of at least about 33 kD as determined under reducing conditions by SDS page and has the amino acid sequence of a native mammalian protein that includes at least one sequence selected from the group consisting of the following sequences of SEQ NO: 1: residues 1–16, residues 20–37, residues 110–120, residues 206–222 and residues 248–256.

5,587,463

TEXAPHYRIN MACROCYCLES AND METAL COMPLEXES THEREOF

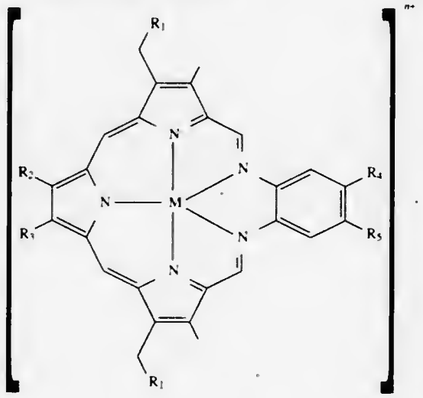
Jonathan L. Sessler; Gregory W. Hemmi, both of Austin, Tex., and Toshiaki Murai, Gifu, Japan, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 871,357, Apr. 20, 1992, Pat. No. 5,292,414, which is a division of Ser. No. 771,393, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,975, Jun. 18, 1990, Pat. No. 5,162,509, which is a division of Ser. No. 320,293, Mar. 6, 1989, Pat. No. 4,935,498. This application Mar. 8, 1994, Ser. No. 207,845

Int. Cl.[6] A61K *49/00;* C07D *255/02*

U.S. Cl. 534—15 23 Claims

2. A compound having the structure



wherein the substituents R_1, R_2 and R_3 are separately and independently selected from the group consisting of H, alkyl, amino, hydroxy, alkoxy, carboxy, carboxyalkyl, carboxamide, ester, amide, polyether, sulfonato, nitro, halide other than iodide, substituted alkyl, substituted ester, substituted ethers, and substituted amide;

R_4 and R_5 are separately and independently selected from the group consisting of H, alkyl, amino, hydroxy, alkoxy, carboxy, carboxyalkyl, carboxamide, ester, amide, polyether, sulfonato, nitro, halide other than iodide, substituted alkyl, substituted ester, substituted ethers and substituted amide or together form an alkenylene bridge of the formula —C(R_6)=C(R_7)— CH=CH—;

where R_6 and R_7 are separately and independently selected from the group consisting of H, alkyl, amino, hydroxy, alkoxy, carboxy, carboxyalkyl, carboxamide, ester, amide, polyether, sulfonato, nitro, halide other than iodide, substituted alkyl, substituted ester, substituted ethers and substituted amide;

M is H, a di- or trivalent metal cation; and

n is between −5 and +5.

5,587,464

PROCESS FOR PRODUCING DIAZOMETHANE DERIVATIVES

Ichiro Kawahara, Tokushima; Isao Wada, Naruto, and Michio Sasaoka, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP94/02124, § 371 Date Aug. 14, 1995, § 102(e) Date Aug. 14, 1995, PCT Pub. No. WO95/16666, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 16, 1994, Ser. No. 501,090

Claims priority, application Japan, Dec. 17, 1993, 5-318495

Int. Cl.[6] C07C *245/14*

U.S. Cl. 534—558 18 Claims

1. A process for producing a diazomethane derivative represented by the general formula

(1)

wherein Ar represents an aryl group which may be substituted, characterized in that a hydrazone derivative represented by the general formula

(2)

wherein Ar is as defined above is oxidized in a two-phase system comprising

(a) a mixed aqueous solution containing, based on the total weight of the mixed aqueous solution, 4 to 14 w/w % of a caustic alkali and 3 to 10 w/w % of an alkali metal hypochlorite,

(b) a hydrophobic organic solvent,

(c) an inorganic iodine compound, and

(d) a phase transfer catalyst.

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5,587,465

5-CHLORO-4-FLUOROPYRIMIDINYL SUBSTITUTED DIAZOPYRIDONE

Karl-Heinz Schündehütte, Leverkusen, and Karl J. Herd, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

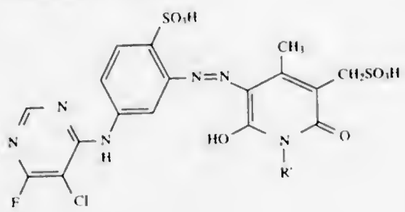
Filed Jan. 4, 1990, Ser. No. 460,702

Claims priority, application Germany, Jan. 10, 1989, 39 00 535.6

Int. Cl.[6] C09B *62/245;62/25;* **D06P** *1/382*

U.S. Cl. 534—635 **2 Claims**

1. A dyestuff of the formula:



wherein

R'=H, CH_3, C_2H_5, C_3H_7 or C_4H_9.

5,587,466

CONDUCTIVE POLYMER DOPED BY A SULPHONATED CYCLODEXTRIN SALT AND DEVICE FOR OBTAINING AND/OR SUPPLYING AN ACTIVE SUBSTANCE INCORPORATING SAID POLYMER

Eric Vieil, Meylan; Gérard Bidan, Grenoble; Andrée Gadelle, Montbonnot, and Maria-Fatima Mendes-Viegas, Lyons, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Division of Ser. No. 246,125, May 19, 1994, Pat. No. 5,480,924. This application Oct. 5, 1995, Ser. No. 539,437

Claims priority, application France, Jun. 3, 1993, 93 06655

Int. Cl.[6] C08L *3/02*

U.S. Cl. 536—4.1 **12 Claims**

1. Apparatus for supplying an active substance comprising a container having therein a solution to which the active substance is to be added, an electrode having an electrically conductive polymer doped by a dopant as an active electrode material and containing said active substance, an auxiliary electrode, said electrodes extending into said solution, and voltage supply means for applying a voltage across said active electrode material and said auxiliary electrode and thereby controlling the supply of said active substance, said dopant being a cyclodextrin having at least one sulphonate group, and said active substance electrochemically salting out from said polymer in response to the application of voltage across said electrodes.

5,587,467

SEPARATING AGENT FOR OPTICAL ISOMERS AND PROCESS FOR PRODUCING THE SAME

Tatsushi Murakami, and Akito Ichida, both of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP94/00992, § 371 Date Jan. 11, 1995, § 102(e) Date Jan. 11, 1995, PCT Pub. No. WO95/00463, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 21, 1994, Ser. No. 374,530

Claims priority, application Japan, Jun. 22, 1993, 5-149956; Jun. 16, 1994, 6-134183; Jun. 20, 1994, 6-137214

Int. Cl.[6] C08B *3/12;3/30;15/10;31/04;* **B01J** *20/10*

U.S. Cl. 536—18.5 **19 Claims**

1. A separating agent for optical isomers comprising a polysaccharide derivative immobilized on a support, the molecules of the polysaccharide derivative being solely crosslinked with each other through a crosslinking reaction and at least the surface of the support being inactive to said crosslinking reaction.

5,587,468

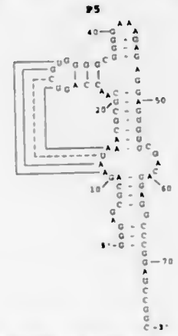
HIGH AFFINITY NUCLEIC ACID LIGANDS TO HIV INTEGRASE

Patrick Allen, and Larry Gold, both of Boulder, Colo., assignors to University Research Corporation, Boulder, Colo.

Continuation of Ser. No. 361,795, Dec. 21, 1994, which is a continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, Ser. No. 964,624, Oct. 21, 1992, and Ser. No. 117,991, Sep. 8, 1993, said Ser. No. 714,131is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application May 16, 1995, Ser. No. 442,572

Int. Cl.[6] C07H *21/02;21/04;* **C12P** *19/34;* **C12Q** *1/68*

U.S. Cl. 536—22.1 **16 Claims**



1. A purified and isolated non-naturally occurring nucleic acid ligand to HIV integrase.

5,587,469

OLIGONUCLEOTIDES CONTAINING N-2 SUBSTITUTED PURINES

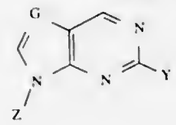
Phillip D. Cook, San Marcos; Kanda S. Ramasamy, Laguna Hills, and Muthiah Manoharan, Carlsbad, all of Calif., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Division of Ser. No. 159,088, Nov. 29, 1993, Pat. No. 5,459,255, and a continuation-in-part of Ser. No. 854,634, Jul. 1, 1992, abandoned, each which is a continuation-in-part of Ser. No. 463,358, Jan. 11, 1990, abandoned, and Ser. No. 566,977, Aug. 13, 1990, abandoned. This application Aug. 30, 1995, Ser. No. 473,450

Int. Cl.[6] C07H *21/02;21/04*

U.S. Cl. 536—23.1 **29 Claims**

1. An oligonucleotide having at least one nucleotide of formula:



wherein

G is CH or N;

X is NH_2 or OH;

Y is RQ or NHRQ, wherein said R is a hydrocarbyl group having from 2 to about 20 carbon atoms; and Q is H, NH_2, polyalkylamino, hydrazines, hydroxylamines, imidazoles, imidazole amides, alkylimidazoles, tetrazole, triazole, or alkoxy groups; and

Z is ribose, 2'-O alkyl ribose, or deoxyribose.

5,587,470

3-DEAZAPURINES

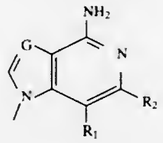
P. Dan Cook, Carlsbad; Oscar L. Acevedo, San Diego, and Robert S. Andrews, San Juan Capistrano, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Division of Ser. No. 27,011, Mar. 5, 1993, Pat. No. 5,457,191, which is a continuation-in-part of Ser. No. 463,358, Jan. 19, 1990, abandoned, and Ser. No. 566,977, Aug. 13, 1990, abandoned. This application Aug. 14, 1995, Ser. No. 514,762

Int. Cl.[6] C07H *21/02;21/04*

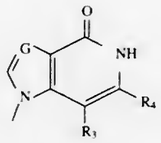
U.S. Cl. 536—23.1 **17 Claims**

1. An oligonucleotide analog wherein at least one heterocyclic base of said oligonucleotide analog is a 3-deazapurine base having the formula:



wherein G is C or N; R_1 is NH_2, alkyl having from one to about 12 carbons, substituted alkyl having from one to about 12 carbons, alkenyl having from two to about 12 carbons, substituted alkenyl having from two to about 12 carbons, aralkyl having from about 6 to about 30 carbons, or amino, and R_2 is amino, alkyl having from one to about 12 carbons, substituted alkyl having from one to about 12 carbons, alkenyl having from two to about 12 carbons, substituted alkenyl having from two to about 12 carbons, or aralkyl having from about 6 to about 30 carbons.

10. An oligonucleotide analog wherein at least one heterocyclic base of said oligonucleotide analog is a 3-deazapurine base having the formula:



wherein G is C or N; R_3 is H, NH_2, alkyl having from one to about 12 carbons, substituted alkyl having from one to about 12 carbons, alkenyl having from two to about 12 carbons, substituted alkenyl having from two to about 12 carbons, aralkyl having from about 6 to about 3.0.carbons, or amino; and R_4 is NH_2, alkyl having from one to about 12 carbons, substituted alkyl having from one to about 12 carbons, alkenyl having from two to about 12 carbons, substituted alkenyl having from two to about 12 carbons, aralkyl having from about 6 to about 30 carbons, or amino; provided that when R_3 is H, R_4 is not NH_2.

5,587,471

METHOD OF MAKING OLIGONUCLEOTIDE LIBRARIES

Phillip D. Cook, Carlsbad; David J. Ecker, Encinitas; Oscar L. Acevedo, San Diego, and Peter Davis, Carlsbad, all of Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed Jan. 11, 1994, Ser. No. 179,972

Int. Cl.[6] C07H *21/00*

U.S. Cl. 536—25.3 **24 Claims**

1. A method of preparing a random phosphate linked oligomer library comprising:

(a) selecting a group of phosphorous bearing monomers;

(b) testing said group of monomers for chemical suitability with respect to at least one predetermined parameter;

(c) selecting from said group of phosphorous bearing monomers a sub-group of monomers that are chemically suitable with respect to said predetermined parameter;

(d) reacting each of the monomers of said sub-group of monomers to a standard reactive site located on a solid support;

(e) analyzing the relative coupling efficiency of each of said monomers of said sub-group of monomers with said standard reactive site;

(f) preparing a mixture of said monomers of said sub-group of phosphorous bearing monomers adjusted in accordance with coupling efficiencies determined in step (e);

(g) reacting via phosphate coupling said adjusted mixture of phosphorous bearing monomers of said sub-group to a solid support or growing oligomer chain; and

(h) repeating step (g) in order to prepare a random oligomer library comprising oligomers of a desired length.

5,587,472

COUMARIN-LABELED NUCLEOSIDE 5'-TRIPHOSPHATES

Nanibhushan Dattagupta, San Diego, Calif., and Jürgen Köcher, West Haven, Conn., assignors to Bayer Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 799,470, Nov. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 744,555, Aug. 13, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,027

Int. Cl.[6] C07H *19/10;19/20;21/04*

U.S. Cl. 536—26.2 **5 Claims**

1. A fluorescent label compound having the formula:

$$A—B^1—B^2—B^3—C$$

wherein

A represents a radical selected from the group consisting of dATP-8-yl and dUTP-5-yl;

$B^1—B^2—B^3$ collectively represent a spacer moiety selected from the group consisting of:

$$—CH{=}CH—CH_2—NH—CO—(CH_2)_5—NH—CO—(CH_2)_3—a$$

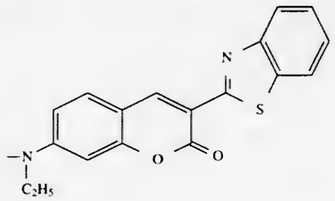
and

$$—NH—(CH_2)_6—NH—CO—(CH_2)_5—NH—CO—(CH_2)_3—a$$

wherein

"a" represents the point of attachment to A; and

C represents a coumarin radical having the formula:



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5,587,473

7-ACYL-3-(SUBSTITUTED CARBAMOYLOXY) CEPHEM COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Shigeto Negi, Ibaraki Prefecture; Motosuke Yamanaka, Chiba Prefecture; Kanemasa Katsu, Ibaraki Prefecture; Isao Sugiyama, Ibaraki Prefecture; Yuuki Komatu, Ibaraki Prefecture; Atsushi Kamata, Ibaraki Prefecture; Akihiko Tsuruoka, Ibaraki Prefecture, and Yoshimasa Machida, Ibaraki Prefecture, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

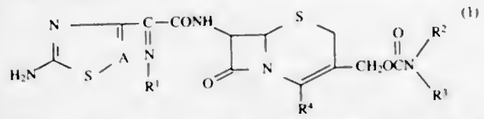
Division of Ser. No. 393,074, Feb. 23, 1995, Pat. No. 5,563,265, which is a continuation of Ser. No. 209,484, Mar. 14, 1994, Pat. No. 5,559,225, which is a continuation of Ser. No. 789,669, Nov. 8, 1991, abandoned. This application Jun. 27, 1996, Ser. No. 671,342

Claims priority, application Japan, Nov. 9, 1990, 2-302783; Feb. 14, 1991, 3-40747; Mar. 8, 1991, 3-67709; Apr. 12, 1991, 3-169512

Int. Cl.[6] **C07D** *501/22;* **A61K** *31/545*

U.S. Cl. 540—222 **4 Claims**

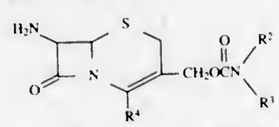
1. A process for the preparation of the compound represented by the formula (1):



(1)

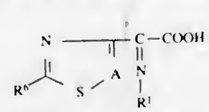
wherein A means a —CH= or —N= group; R^1 denotes a hydroxyl group, a lower alkoxyl group, a fluorine-substituted lower alkoxyl group or a hydroxyl group protected by a protecting group; R^2 and R^3 are the same or different and individually represent a lower alkyl group, a hydroxyl-substituted lower alkyl group, a carbamoyl-substituted lower alkyl group or a cyano-substituted lower alkyl group, R^2 is a hydrogen atom and R^3 is a lower alkoxyl group or a lower alkyl group which may optionally be substituted by one or more halogen atoms, or the group represented by the formula

means a 4–6 membered heterocyclic group, which contains one nitrogen atom, or a morpholino group, said heterocyclic group or morpholino group being optionally substituted by one or more lower alkyl, hydroxyl and/or hydroxyl-substituted lower alkyl groups; and R^4 denotes a carboxyl group or a carboxyl group protected by a protecting group; or a pharmaceutically acceptable salt thereof, which comprises reacting a compound represented by the following formula (2):



(2)

wherein R^2, R^3 and R^4 have the same meanings as defined above or a salt thereof with a compound represented by the following formula (3):



(3)

wherein R^6 represents an amino group or an amino group protected by a protecting group, A and R^1 have the same meanings as defined above, or a reactive acid derivative thereof or a salt thereof; and, if necessary, removing the protecting group of the amino, carboxyl or hydroxyl group or protecting the carboxyl group with a protecting group.

5,587,474

METHOD FOR REMOVING THE PROTECTING GROUP FOR CARBOXYL GROUP

Kazuhiko Kondo, Osaka; Hiroshi Horikawa, Kawanishi, and Tameo Iwasaki, Nishinomiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

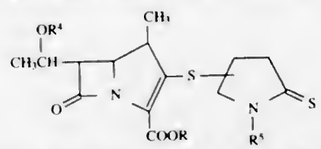
Filed Jun. 17, 1993, Ser. No. 77,383

Claims priority, application Japan, Jun. 18, 1992, 4-202866; Dec. 4, 1992, 4-325031

Int. Cl.[6] **C07D** *403/12*

U.S. Cl. 540—350 **16 Claims**

1. A method for removing the the protecting group of the carboxyl group from a compound of the formula II.



II

wherein R is the formula: $—CH_2—CH=CHR^0$, R^0 is a hydrogen atom, a lower alkyl group or a phenyl group, R^4 is a hydrogen atom or a protecting group for a hydroxy group, and R^5 is a hydrogen atom or a lower alkyl group comprising:

reacting said compound II with an alkyl-scavenger selected from the group consisting of dimedone, 1,3-cyclohexadione, acetylacetone, ethylacetoacetate, an N-lower alkyl aniline and aniline in the presence of a palladium (II) compound and a compound selected from the group consisting of a tri-lower alkyl phosphate and a triphenyl phosphine in an aqueous organic solvent.

5,587,475

DERIVATIZED VIRGINIAMYCIN M_1

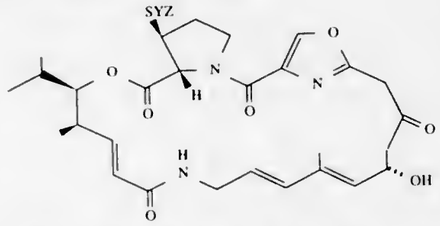
Paul Helquist, Granger, Ind., and Carlo Cocito, Brussels, Belgium, assignors to University of Notre Dame, Notre Dame, Ind.

Filed May 18, 1995, Ser. No. 444,236

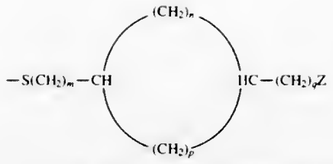
Int. Cl.[6] **C07D** *498/14;* **A61K** *37/00;37/02*

U.S. Cl. 540—456 **22 Claims**

1. A compound having the formula



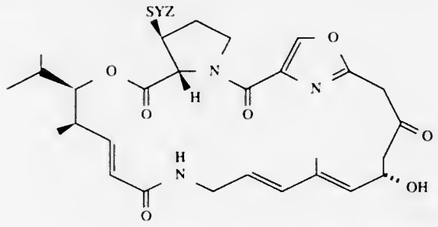
in which Y represents one of $(CH_2)_n$ (n=1 to 20), $(CH_2)_m CH[(CH_2)_n CH_3](CH_2)_p$(m=0 to 20, n=0 to 20, p=0 to 20), and



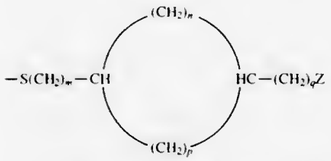
(m = 0 to 10, n = 0 to 10, p = 0 to 10, q = 0 to 10)

or unsaturated derivatives thereof wherein adjacent pairs of saturated carbon atoms are replaced by alkene or alkyne units; and in which Z represents one of $CO_2CH_2CCl_3$, $CO_2(CH_2)_nCH_3$, $CO_2(CH_2)_m CH[(CH_2)_n CH_3](CH_2)_p CH_3$, $CO_2(CH_2)_m(CH=CH)(CH_2)_n H$, CO_2H, $CONH_2$, CONHR (R=saturated or unsaturated n-alkyl or branched alkyl as shown for the esters above), CONRR' (R and R'=saturated or unsaturated n-alkyl or branched alkyl as shown for the esters above), and $CO_2^- M^+$ (M^+=lithium, sodium, potassium, cesium, magnesium, or calcium cation, with or without other coordinating groups, or ammonium, monoalkylammonium, dialkylammonium, trialkylammonium, or tetraalkylammonium bearing n-alkyl or branched alkyl groups as shown for the esters above, or ammonium salt derivatives of amino acids), including isomeric forms and mixtures thereof.

2. A process for preparing a virginiamycin derivative of the formula



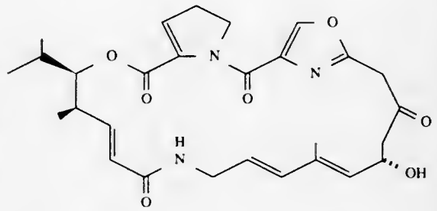
and isomeric forms and mixtures thereof, in which S represents a sulfur atom, Y represents one of $(CH_2)_n$ (n=1 to 20), $(CH_2)_m CH[(CH_2)_n CH_3](CH_2)_p$ (m=0 to 20, n=0 to 20, p=0 to 20), and



(m = 0 to 10, n = 0 to 10, p = 0 to 10, q = 0 to 10)

(m=0 to 10, n=0 to 10, p=1 to 10, q=0 to 10), or unsaturated derivatives thereof wherein adjacent pairs of saturated carbon atoms are replaced by alkene or alkyne units; and Z represents one of $CO_2CH_2CCl_3$, $CO_2(CH_2)_nCH_3$, $CO_2(CH_2)_m CH[(CH_2)_n CH_3](CH_2)_p CH_3$, $CO_2(CH_2)_m(CH=CH)(CH_2)_n H$, CO_2H, $CONH_2$, CONHR (R=saturated or unsaturated n-alkyl or branched alkyl as shown for the esters above), CONRR' (R and R'=saturated or unsaturated n-alkyl or branched alkyl as shown for the esters above), and $CO_2^- M^+$ (M^+=lithium, sodium, potassium, cesium, magnesium, or calcium cation, with or without other coordinating groups, or ammonium, monoalkylammonium, dialkylammonium, trialkylammonium, or tetraalkylammonium bearing n-alkyl or branched alkyl groups as shown for the esters above, or ammonium salt derivatives of amino acids), comprising:

reacting a ω-mercapto ester having the formula SYZ, wherein S, Y and Z are as defined above, with a virginiamycin M_1 sample having the formula:



in an organic solvent in the presence of a base, said reaction occurring under reaction conditions conducive for attachment of the SYZ side chain to said virginiamycin M_1 via a Michael addition.

5,587,476

FULLERENE DERIVATIVES, METHOD OF SYNTHESIZING THEM AND THEIR USE

Klaus-Dieter Kampe, Bad Soden am Taunus; Hans-Ulrich ter Meer, Frankfurt am Main; Norbert K. Egger, Wiesbaden, and Martin A. Vogel, Nackenheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

PCT No. PCT/EP93/02306, § 371 Date Feb. 15, 1995, § 102(e) Date Feb. 15, 1995, PCT Pub. No. WO94/05671, PCT Pub. Date Mar. 17, 1994

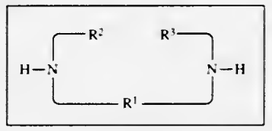
PCT Filed Aug. 26, 1993, Ser. No. 381,946

Claims priority, application Germany, Sep. 8, 1992, 42 29 979.9; Apr. 19, 1993, 43 12 632.4

Int. Cl.[6] **C07D** *241/38;243/10;245/04;487/06*

U.S. Cl. 540—472 **20 Claims**

1. An addition compound obtainable by reaction of a diamine of the formula I,



I

where

R^1 is $(C_2–C_4)$-alkylene or 1,2- or 1,3-cyclo-$(C_3–C_7)$-alkylene and

R^2 and R^3 which are identical or different, are $(C_1–C_3)$-alkyl or hydrogen or

R^2 and R^3 together are $(C_2–C_4)$-alkylene, with fullerene C_{60} and/or C_{70}, and also its acid-addition salts, with the proviso that addition compounds obtainable by reaction of a diamine of the formula I in which R^1=C_2-alkylene and R^2 and R^3= hydrogen with fullerene C_{60} are excluded.

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20. A method of using the addition compound as claimed in claim 1, comprising the step of transmitting electrical energy through said compound.

5,587,477

Patent Not Issued For This Number

5,587,478

SAPPHYRIN MULTIMERS

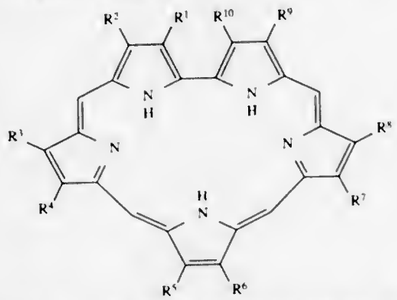
Jonathan L. Sessler; Vladimir Král, and Andrei Andrievsky, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 964,607, Oct. 21, 1992, Pat. No. 5,457,195. This application Mar. 15, 1995, Ser. No. 405,275

Int. Cl.[6] **C07D** *487/22;* **C08G** *10/02*

U.S. Cl. 540—474 **20 Claims**

1. A sapphyrin multimer having structure I:



wherein each of R^1—R^{10} are independently hydrogen, alkyl, alkene, alkyne, halide, alkylhalide, hydroxyalkyl, hydroxyalkylamido, glycol, polyglycol, thiol, thioalkyl, aminoalkyl, carboxyalkyl, carboxyamidealkyl, oxyalkyl, alkoxyalkyl, aryloxyalkyl, oxyhydroxyalkyl, alkyloxycarbonyl, aryloxycarbonyl, aldehyde, ether, ketone, carboxylic acid, phosphate, phosphonate, saccharide, nucleobase, sulfate, phosphate substituted alkyl, phosphonate substituted alkyl or sulfate substituted alkyl; wherein at least one of R^1–R^{10} is of the formula $(CH_2)_n$—A—$(CH_2)_m$—B, where

A is alkyl, oxy, sullide, amide, carbonyl, alkenyl, alkynyl, aryl, alkylhalide, hydroxyalkyl, glycol, polyglycol, alkylthiol, substituted alkyl, phosphate, phosphonate, sulfate, phosphate substituted alkyl, phosphonate substituted alkyl, sulfate substituted alkyl, carbonate, carbamate, bis(aminoguanidinium), carboxy, carboxyamide, carboxyamidealkyl, carboxyamidearyl, thiol-substituted carboxyamide, or derivatized carboxyamide;

B is a sapphyrin, or a sapphyrin derivative, or an oligomer or polymer of sapphyrin or of a sapphyrin derivative having up to about 200 sapphyrin units; and

n and m are independently an integer from 0 to 10.

5,587,479

BASIC DERIVATIVES OF GLUTAMIC ACID AND ASPARTIC ACID AS GASTRIN OR CHOLECYSTOKININ ANTAGONISTS

Francesco Makovec; Lucio C. Rovati, and Luigi A. Rovati, all of Monza, Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy

PCT No. PCT/EP93/00842, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO93/21172, PCT Pub. Date Oct. 28, 1993

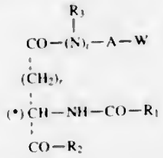
PCT Filed Apr. 6, 1993, Ser. No. 318,651

Claims priority, application Italy, Apr. 9, 1992, T092A0325

Int. Cl.[6] **C07D** *221/20;401/06;209/54;* **A61K** *31/40*

U.S. Cl. 544—70 **18 Claims**

1. A compound represented by the general formula (I):

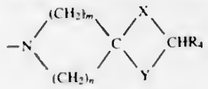


(I)

wherein r is 1 or 2;

R_1 is independently selected from the group consisting of an unsubstituted phenyl group; a mono- or di-substituted phenyl group in which the substituent is independently selected from the group consisting of a halogen atom, a linear or branched C_1–C_4 alkyl group, a nitro group, a cyano group, a methoxy group and a trifluoromethyl group; an unsubstituted phenylamino group; a mono- or di-substituted phenylamino group in which the substituent is independently selected from the group consisting of a halogen atom, a linear or branched C_1–C_4 alkyl group, a nitro group, a cyano group, a methoxy group and a trifluoromethyl group; a 2(beta)naphthyl group; and a heterocyclic, monocyclic or bicyclic group selected from the group consisting of a furyl group (2- or 3-yl), an indolyl group (2- or 3-yl), an isoindolyl group (3-yl), a benzofuranyl group (2- or 3-yl), a quinolinyl group (2- or 3-yl), an isoquinolinyl group (3-yl), an unsubstituted pyridyl group and a mono- or di-substituted group in which the substituents are methyl or chloro;

R_2 is a heterocyclic spiro group represented by:



wherein m and n independently represent a value of between 1 and 3, provided that the ring formed consists of at least 5 atoms; X and Y independently represent $(CH—R_4)_z$, TCH_2 or CH_2T; T is O or S; R_4 independently represents a hydrogen atom, a linear or branched C_1–C_4 alkyl group, OCH_3 or OH; and z has a value of from 0 to 3, provided that the ring formed consists of at least 3 atoms;

R_3 is H, CH_3 or C_2H_5;

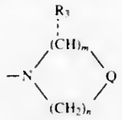
A is a bond or a linear or branched alkylene group comprising from 1 to 4 carbon atoms;

W is

a_2) a tertiary amino group represented by:

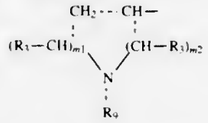
wherein R_7 and R_8 independently represent a hydrogen atom or a linear or branched alkyl group comprising from 1 to 5 carbon atoms, provided that R_7 and R_8 are not both hydrogen atoms;

b_2) a heterocyclic group represented by:



wherein R_3, m and n have the above defined meanings; Q is a bond, CH_2, an oxygen atom, a sulphur atom, a nitrogen atom, or N—R_9; R_9 is a hydrogen atom, a linear or branched C_1–C_4 alkyl group, a phenyl group or a benzyl group, the aromatic groups of which may be unsubstituted or mono- or di-substituted as described above for the phenyl group in R_1;

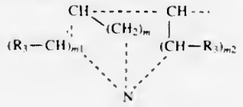
c_2) a heterocyclic group represented by:



wherein m1 and m2 independently represent a value of between 0 and 3; and R_3 and R_9 have the above defined meanings;

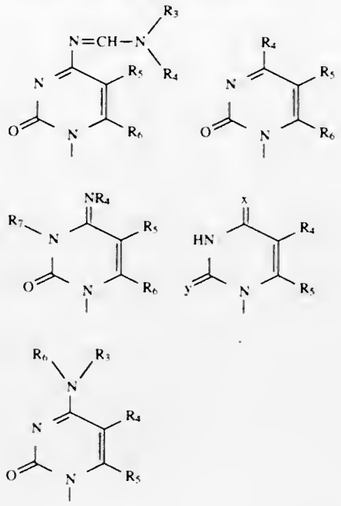
or

d_2) a heterocyclic group represented by:



wherein m, m1, m2 and R_3 have the above defined meanings; t is 1, except when Q is N—R_9 in b_2), then t is 0 or 1; and pharmaceutically acceptable salts thereof.

R_2 is selected from the group consisting of:



wherein:

x and y are independently O or S;

R_3 is selected from the group consisting of hydrogen, C_{1-10} acyl, hydroxyl, amino, C_{1-6} alkyl, alkenyl or alkynyl, and carboxyl;

R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, hydroxymethyl; trifluoromethyl, C_{1-6} alkyl, alkenyl or alkynyl, bromine, chlorine, fluorine, iodine, hydroxyl, amino, cyano, carboxyl, carbamoyl, alkoxycarbonyl, arylthio, acyloxy, thiocarboxy, thiocarbamoyl, carbamate, ureido, amidino, aryloxy and carboxamide; and

R_7 is selected from the group consisting of hydrogen, bromine, chlorine, fluorine, iodine, amino, hydroxyl, C_{1-10} acyl, C_{1-10} alkyl, and C_{7-20} aralkyl.

5,587,480

SUBSTITUTED 1,3-OXATHIOLANES AND SUBSTITUTED 1,3-DITHIOLANES WITH ANTIVIRAL PROPERTIES

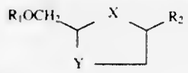
Bernard Belleau, deceased, late of Westmount; Nghe Nguyen-Ba, La Prairie; Laval C. C. Kong, Kirkland; Tarek Mansour, Montreal; Haolun Jin, Pierrefonds, all of Canada, and Livio Brasili, Modena, Italy, assignors to BioChem Pharma, Inc., Laval, Canada

Continuation-in-part of Ser. No. 791,441, Nov. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 612,840, Nov. 13, 1990, abandoned. This application Apr. 20, 1994, Ser. No. 230,317

Int. Cl.[6] **C07D** *239/02;* **A61K** *31/505*

U.S. Cl. 544—310 **18 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt or ester of that compound, the geometric and optical isomers thereof, and mixtures of those isomers:



(I)

wherein:

X is selected from the group consisting of S, S=O, SO_2;

Y is O;

R_1 is hydrogen; and

5,587,481

PREPARATION OF (S)-DECAHYDROISOQUINOLINE-3-CARBOXYLIC ACID T-BUTYLAMIDE

David R. Allen, Oak Brook, Ill.; Scott Jenkins, San Francisco, Calif.; Loraine Klein, Streamwood, Ill.; Robert Erickson, Des Plaines, Ill., and Diane Froen, Hoffman Estates, Ill., assignors to The Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1996, Ser. No. 603,744

Int. Cl.[6] **C07D** *217/16*

U.S. Cl. 546—146 **16 Claims**

1. A method of preparing (S)-N-tert-butyl-1,2,3,4-tetrahydro-3-isoquinoline-carboxamide which comprises the following steps:

forming a first reaction mixture in a reaction vessel, said mixture comprising: (3S)-1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid, 1 to 4 equivalents of phosgene, and an organic solvent having a boiling point between about 50° and 125° C.;

heating said first reaction mixture to an elevated temperature in the range of about 50° to 125° C., and maintaining the reaction mixture at said elevated temperature for a period of about 2 to 6 hours to produce an N-carboxy arthydride;

cooling said first reaction mixture to an amine-addition temperature in the range of about −20° to 5° C.;

adding between 1 and 4 equivalents of tert-butyl amine to said reaction vessel to form a second reaction mixture; and

maintaining said second reaction mixture at a temperature of greater than 5° C. until said N-carboxy anhydride has been converted to (S)-N-tert-butyl- 1,2,3,4-tetrahydro-3-isoquinoline-carboxamide.

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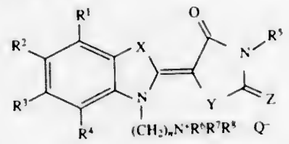
5,587,482

ZEROMETHINE MEROCYANINE DYES USEFUL AS SPECTRAL SENSITIZERS IN PHOTOGRAPHIC ELEMENTS

Dietrich M. Fabricius, Hendersonville, N.C.; Ralf H. Harms, Neu-Isenburg, Germany, and James J. Welter, Flat Rock, N.C., assignors to Sterling Diagnostic Imaging, Inc., Glasgow, Del.

Filed Mar. 7, 1996, Ser. No. 612,354
Int. Cl.[6] C07D *417/04*
U.S. Cl. 548—179 **19 Claims**

1. A dye having the structure:



wherein:

R^1, R^2, R^3, and R^4 each independently represents H; halogen; alkyl of 1–6 carbons; aryl of 6–24 carbons; alkoxy of 1–6 carbons; carbonyl; or sulfonate; or R^1 and R^2, R^2 and R^3, or R^3 and R^4 taken together represent the atoms necessary to complete a six-membered carbocylic ring;

R^5 represents hydrogen, alkyl of 1–6 carbons or aryl of 6–24 carbons;

R^6, R^7, and R^8 independently represent alkyl 1–6 carbons; aryl of 6–24 carbons; or any pair of R^6, R^7 and R^8 taken together represent a five- or six-member heterocyclic ring;

X represents O, S, CH=CH, Se, Te or N—R^{10};

Y represents O, S, or N—R^9;

Z represents O, S or Se;

R^9 represents alkyl of 1–6 carbons; or an aryl of 6–24 carbons;

R^{10} represents alkyl of 1–6 carbons;

n is an integer of 1–6; and

Q represents a counterion.

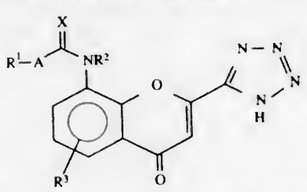
5,587,483

PROCESS FOR PREPARING TETRAZOL-5-YL SUBSTITUTED BENZOPYRAN COMPOUNDS

Graham Johnson, Worthing; Neil Smith, Shoreham-by-Sea; Graham R. Geen, Stansted Mountfitchet; Inderjit S. Mann, Welling, all of England, and Vance Novack, Devon, Pa., assignors to SmithKline Beecham PLC, United Kingdom

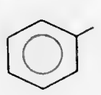
Filed May 26, 1995, Ser. No. 451,892
Claims priority, application United Kingdom, Nov. 27, 1992, 9224922
Int. Cl.[6] C07D *405/04;257/04*
U.S. Cl. 548—252 **9 Claims**

1. A process for preparing a compound of structure (I):



in which,

R^1 is C_{1-20}alkyl, C_{2-20}alkenyl, C_{2-20}alkynyl, or a group of structure:



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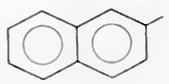
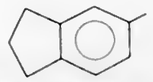




each of which may be substituted by one or two substituents selected independently from the group consisting of C_{1-20}alkyl, C_{2-20}alkenyl or C_{2-20}alkynyl, up to 5 carbon atom(s) of which may be replaced independently by one or more radicals selected from the group consisting of oxygen, sulphur, halogen, nitrogen, benzene, thiophene, naphthalene, a carbocyclic ring of from 4 to 7 carbon atoms, carbonyl, carbonyloxy, hydroxy, carboxy, azido and nitro;

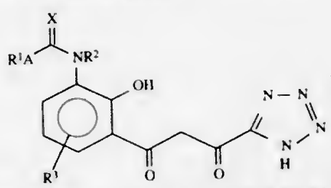
R^2 is hydrogen or C_{1-6}alkyl;

R^3 is hydrogen, halogen, hydroxy, nitro, a group of general formula —$COOR^4$ (wherein R^4 represents hydrogen or C_{1-6}alkyl), or C_{1-6}alkyl, C_{1-6}alkoxy or C_{1-6}alkylthio;

A is a single bond or a methylene, ethylene, trimethylene, tetramethylene, vinylene, propenylene, butenylene, butadienylene or ethynylene group optionally being substituted by one, two or three C_{1-10}alkyl and/or phenyl group(s); and

X is oxygen or sulphur;

or a salt, hydrate or solvate thereof, which comprises cyclisation of a compound of structure (II)



or a salt, hydrate or solvate thereof, in which R^1, R^2, R^3, A and X are as described for structure (I), and optionally thereafter forming a salt, hydrate or solvate thereof.

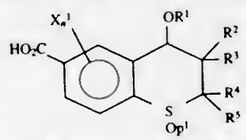
5,587,484

PYRAZOLE PROCESS AND INTERMEDIATES

Mitsuru Shibata; Masashi Sakamoto, and Ichiro Nasuno, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Division of Ser. No. 290,943, Aug. 23, 1994, Pat. No. 5,468,722. This application Aug. 1, 1995, Ser. No. 509,963
Claims priority, application Japan, Mar. 3, 1992, 4-045821
Int. Cl.[6] C07D *335/06;409/06*
U.S. Cl. 548—364.4 **17 Claims**

1. A process for the production of a pyrazole compound, the process comprising reacting a compound of the formula (II)



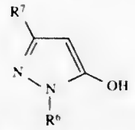
wherein R^1 is a C_1–C_6 alkyl group,

each of R^2, R^3, R^4 and R^5 is independently hydrogen or a C_1–C_4 alkyl group,

X^1 is a C_1–C_4 alkyl group or a halogen atom,

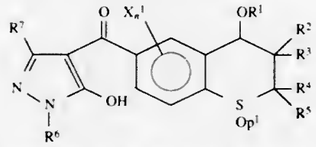
n is an integer of 1 to 3, and

p^1 is an integer of 0 to 2, with a compound of the formula (III)



wherein R^6 is a C_1–C_4 alkyl group, and

R^7 is hydrogen or a C_1–C_4 alkyl group, to form a pyrazole compound of the formula (Ia).

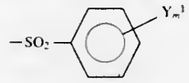


wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, X^1, n and p^1 are as defined above,

and optionally reacting the pyrazole compound (Ia) with a sulfonic acid halide of the formula (IV).

Q^2X^2 (IV)

wherein Q^2 is —SO_2—R^8 or



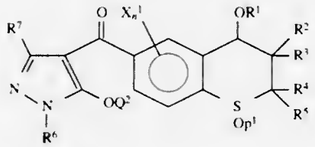
in which R^8 is a C_1–C_6 alkyl group,

Y is hydrogen, a C_1–C_4 alkyl group or a halogen atom, and

m^1 is an integer of 1 to 3, and

X^2 is a halogen atom

to obtain a pyrazole compound of the formula (Ib).



wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, X^1, n, p^1 Q^2, R^8, Y and m^1 are as defined above.

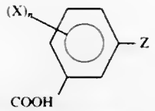
5,587,485

HETEROCYCLIC- AND CARBOCYCLIC- SUBSTITUTED BENZOIC ACIDS AND SYNTHESIS THEREOF

John P. Chupp; Bruce C. Hamper, both of Kirkwood, and Richard H. Wettach, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 277,726, Jul. 20, 1994, abandoned. This application Mar. 20, 1995, Ser. No. 407,352
Int. Cl.[6] C07D *231/12;231/16;231/18*
U.S. Cl. 548—377.1 **9 Claims**

1. Process for the preparation of compounds according to Formula I



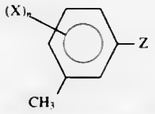
and salts and esters thereof wherein

X is halogen C_{1-6} (halo)alkyl, or alkylsulfonyl; alkoxyalkyl or polyalkoxy having up to 8 carbon atoms; (halo)alkenyl or (halo)alkynyl having up to 6 carbon atoms; NH_2, NO_2, CN, or COAR, where A is O or S and R is a (halo)alkyl, (halo)alkenyl, or (halo)alkynyl group having up to 6 carbon atoms;

n is 0–4 and

Z is a pyrazole ring having at least one substituent which is a C_{1-6}alkyl group; the other ring substituent(s), if any, which ring substituents may be one or more X members,

which comprises oxidizing a compound according to Formula III



wherein X, n and Z are as previously defined; with oxygen or an oxygen-containing gas in the presence of an oxidizing catalyst in an inert solvent.

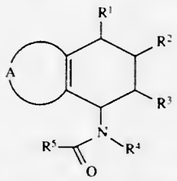
5,587,486

1-AMINO-2-CYCLOHEXENE DERIVATIVE AND PRODUCTION PROCESS THEREFOR

Naoshi Nakagawa; Tadashi Hatanaka; Tatsuhiko Hayashibara, and Manzo Shiono, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jun. 30, 1995, Ser. No. 497,086
Claims priority, application Japan, Jun. 30, 1994, 6-149597
Int. Cl.[6] C07D *209/56;333/50*
U.S. Cl. 548—448 **25 Claims**

1. A 1-amino-2-cyclohexene compound represented by the following formula (I):



wherein A represents a bivalent organic group which may contain 1 to 3 oxygen atoms, nitrogen atoms and/or sulfur atoms, wherein A forms a ring having a total of 5–8 members, and the ring may form a condensed ring with one or more additional rings; R^1 represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or an aralkyl group, R^2 represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an aralkyl group, a cyano group or a group represented by the formula: —COR^{21}, where R^{21} represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an aralkyl group, an alkoxy group, an alkenyloxy group, an aryloxy group, an aralkyloxy group or an amino group which may have a substituent, R^3 represents a cyano group, a nitro group or a group represented by the formula: —COR^{31}, where R^{31} represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group,

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an aralkyl group, an alkoxy group, an alkenyloxy group; an aryloxy group, an aralkyloxy group or an amino group which may have a substituent, R^4 represents an alkyl group, an alkenyl group, an aryl group or an aralkyl group, R^5 represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an aralkyl group, an alkoxy group, an alkenyloxy group, an aryloxy group, an aralkyloxy group or an amino group which may have a substituent, in which R^2 and R^{31} may join together to form a bivalent organic group optionally containing an oxygen atom or a nitrogen atom.

5,587,487

TETRAIODOPYRROLE DERIVATIVES AS CONTRAST MEDIUM AND AS ANTISEPTIC

Christoph De Haen, Peschiera Borromeo; Fulvio Uggeri, Codogno; Ornella Gazzotti, Pianengo, and Marino Brocchetta, Pavia, all of Italy, assignors to Dibra S.p.A., Milan, Italy

PCT No. PCT/EP94/04201, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO95/17380, PCT Pub. Date Jun. 29, 1995

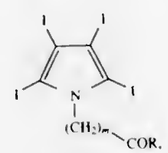
PCT Filed Dec. 16, 1994, Ser. No. 448,510

Claims priority, application Italy, Dec. 23, 1993, MI93A2718

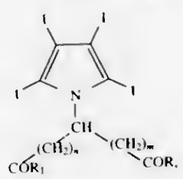
Int. Cl.[6] C07D *207/305*

U.S. Cl. 548—561 **1 Claim**

1. A compound of general formulae (I) and (II)



(I)



(II)

wherein:

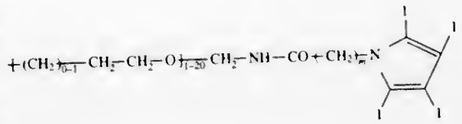
m and n are independently between 0 and 5,

R is H, $—OR_2$, $—NR_3R_4$, wherein R_2 is H, straight or branched (C_1–C_8) alkyl, straight or branched (C_1–C_8) hydroxyalkyl with 1—7 -OH groups, or polyoxalkyl group of formula

$$+(CH_2)_{0-1}—CH_2—CH_2—O\}_{1-20}G$$

wherein G is H, CH_3, CH_2CH_3,

R_3 and R_4 which are the same or different, have the same meanings as R_2, or they are a group of formula $—(CH_2)_{1-2}R_5$ where R_5 is one of the following groups COOH, SO_3H, SO_2H, PO_3H, or PO_2H, or they are a group of formula $—CH_2CH_2R_6$ where R_6 is a quaternary ammonium group of aliphatic or aromatic nature, or a group of formula



wherein m has the above meanings, or R_3 and R_4 are a neutral or ionic organic group containing from one to two triiodinated aromatic nuclei, or R_3 and R_4, considered together, are a (C_3–C_7) group, optionally interrupted by atoms of O, S, N, or optionally substituted by hydrophilic or radiopaque functional groups,

R_1 has the same meanings as R and is different or the same as R, and

in case the compounds of formulae (I) and (II) contain free carboxylic and/or phenol functions, also the salts of said compounds with physiologically acceptable organic bases which are selected from primary, secondary or tertiary amines, or basic amino acids, or with inorganic bases whose cations are sodium, potassium, magnesium, calcium or their mixtures and, in case compounds of formulae (I) and (II) contain cationic functions, also the salts of said compounds with anions of physiologically acceptable organic acids selected from acetate, fumarate, succinate, oxalate, citrate, glutamate, aspartate or with anions of inorganic acids selected from chlorides, bromides, iodides or sulfates.

5,587,488

BIS-SULFONIUM SALTS OF AMINO SUBSTITUTED BIS(HALOMETHYL) BENZENE

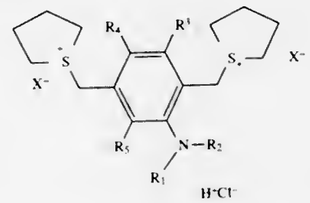
John D. Stenger-Smith; William P. Norris, and Andrew P. Chafin, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 252,701, May 31, 1994, abandoned. This application May 10, 1995, Ser. No. 441,178

Int. Cl.[6] C07D *409/10*

U.S. Cl. 549—59 **4 Claims**

1. The bis-sulfonium salts of amino substituted bis(halomethyl) benzene compounds having the formula:



wherein X is halogen; wherein R_1 and R_2 on the amine and quaternized amine group are each independently hydrogen; alkyl having 1 to about 22 carbon atoms; alkyl sulfonate having 1 to about 22 carbon atoms; or alcohol having 1 to about 22 carbon atoms, wherein R_3, R_4, and R_5 are each independently hydrogen; alkyl having 1 to about 22 carbon atoms; alkoxy having 1 to about 22 carbon atoms; nitro; halogen; amine; sulphonate; silyl; perfluoro alkyl; or cyano esters.

5,587,489

TAXANE AND BACCATIN III ANALOGS BEARING NEW C2 AND C4 FUNCTIONAL GROUPS

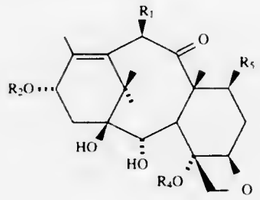
Robert A. Holton, and Seokchan Kim, both of Tallahassee, Fla., assignors to Florida State University, Tallahassee, Fla.

Division of Ser. No. 10,798, Jan. 29, 1993, Pat. No. 5,399,726. This application Jan. 13, 1995, Ser. No. 372,103

Int. Cl.[6] C07D *317/70;305/14*

U.S. Cl. 549—229 **34 Claims**

1. A compound having the formula



wherein

R_1 is H, —OH, protected hydroxy, or $—OCOR_6$;

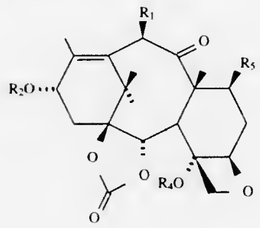
R_2 is a hydroxy protecting group;

R_4 is H or R_8CO—;

R_5 is —OH or protected hydroxy; and

R_6 and R_8 are independently H, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, monocyclic aryl, or monocyclic heteroaryl.

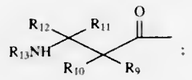
3. A compound having the formula



wherein

R_1 is H, —OH, protected hydroxy, or $—OCOR_6$;

R_2 is H or a hydroxy protecting group, or



R_4 is R_8CO—;

R_5 is —OH or protected hydroxy;

R_6 and R_8 are independently H, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, monocyclic aryl, or monocyclic heteroaryl;

R_9 is $—OR_{14}$, $—SR_{15}$, or $—NR_{16}R_{17}$;

R_{10} is hydrogen, alkyl, alkenyl, alkynyl, aryl or heteroaryl;

R_{11} and R_{12} are independently hydrogen, alkyl, alkenyl, alkynyl, aryl, acyl or heteroaryl, provided R_{11} and R_{12} are not both acyl;

R_{13} is $—COR_{18}$, $—COOR_{18}$, $—COSR_{18}$, $—CONR_{12}R_{18}$, or $—SO_2R_{19}$;

R_{14} is hydrogen, alkyl, alkenyl, alkynyl, aryl, heteroaryl, or hydroxy protecting group;

R_{15} is alkyl, alkenyl, alkynyl, aryl, heteroaryl, or sulfhydryl protecting group;

R_{16} is hydrogen, alkyl, alkenyl, alkynyl, aryl, or heteroaryl;

R_{17} is an amino protecting group;

R_{18} is alkyl, alkenyl, alkynyl, aryl, or heteroaryl; and

R_{19} is alkyl, alkenyl, alkynyl, aryl, heteroaryl, $—OR_{15}$, or $—NR_{12}R_{16}$.

5,587,490

METHOD OF INACTIVATION OF VIRAL AND BACTERIAL BLOOD CONTAMINANTS

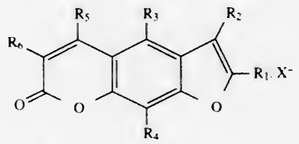
Raymond P. Goodrich, Jr., Pasadena, Calif.; Matthew S. Platz, Columbus, Ohio; Nagender Yerram, South Pasadena; Roger W. Hackett, Pasadena, both of Calif.; Marjan van Borssum Waalkes, Vernendaal, Netherlands; Christine M. Williams-Hughes, Sierra Madre, Calif., and Victoria A. Wong, Cary, N.C., assignors to Credit Managers Association of California, Burbank, Calif.

Continuation-in-part of Ser. No. 47,749, Apr. 14, 1993, which is a continuation-in-part of Ser. No. 825,691, Jan. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 685,931, Apr. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 656,254, Feb. 15, 1991, abandoned, and a continuation-in-part of Ser. No. 632,277, Dec. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 686,334, Apr. 16, 1991, abandoned, and Ser. No. 510,234, Apr. 16, 1990, abandoned. This application Dec. 10, 1993, Ser. No. 165,305

Int. Cl.[6] C07D *493/04*

U.S. Cl. 549—282 **7 Claims**

1. A compound of the formula:



wherein X is an anionic counterion; R_1, R_2, R_3, R_4, R_5 and R_6 are independently a halogen; H; linear or branched alkyl of 1–10 carbon atoms; linear or branched alkoxy of 1–10 carbon atoms; $—(CH_2)_m—O—(CH_2)_p—Z^+.R'R''R'''$ or $—O—(CH_2)_n—Z^+.R'R''R'''$ wherein n, m and p are independently integers from 1 to 10 and R', R'' and R''' are independently H or linear or branched alkyl of 1 to 10 carbon atoms with the proviso that only one of R_1, R_2, R_3, R_4, R_5 or R_6 is

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$-(CH_2)_m-O-(CH_2)_p-Z'.R'R''R'''$ or $-O-(CH_2)_n-Z'.R'R''R'''$, and at least one of R_1, R_2, R_3, R_4, R_5 or R_6 is a halogen; and Z is N or P.

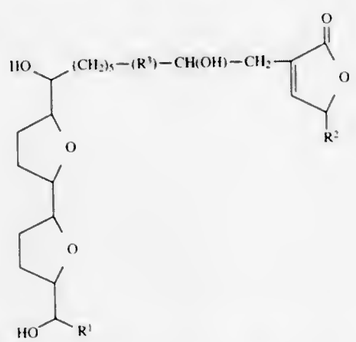
5,587,491

METHOD FOR THE SYNTHESIS OF BIS-TETRAHYDROFURANYL ANNONACEOUS ACETOGENINS

Thomas R. Hoye, St. Paul, and Lushi Tan, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

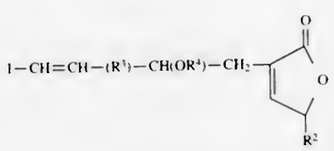
Filed Mar. 15, 1995, Ser. No. 405,131
Int. Cl.[6] C07D *305/12*
U.S. Cl. 549—320 **6 Claims**

1. A method for preparing an acetogenin of formula (I):

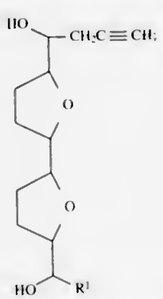


wherein R^1, R^2 and R^3 alkyl or aryl; comprising the steps of

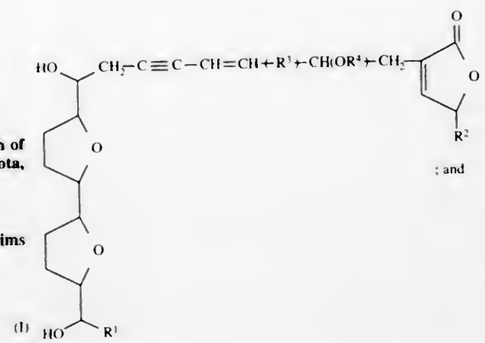
(a) coupling a vinyl iodide of formula II:



wherein R^4 is a removable hydroxy protecting group, with a compound of formula (III):



in the presence of an effective amount of a palladium catalyst, CuI and a base, in an organic solvent, to yield a enyne of the formula IV:



; and

(b) hydrogenating the enyne of formula IV and subsequently removing the hydroxy protecting group to yield a compound of formula I.

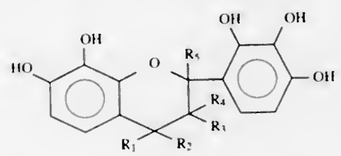
5,587,492

POLYHYDRIC PHENOL COMPOUND AND POSITIVE RESIST COMPOSITION COMPRISING THE SAME

Jun Tomioka, Hyogo; Yasunori Uetani, Osaka; Hirotoshi Nakanishi, Osaka; Ryotaro Hanawa, Osaka, and Ayako Ida, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 853,547, Mar. 18, 1992, Pat. No. 5,436,107. This application Apr. 18, 1995, Ser. No. 423,760
Claims priority, application Japan, Mar. 25, 1991, 3-60024
Int. Cl.[6] C07D *311/60*
U.S. Cl. 549—406 **3 Claims**

1. A polyhydric phenol compound of the formula:



wherein R_1 to R_5 are independently a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group or an aryl group, provided that at least one of R_1 and R_2 is an alkyl group, an alkenyl group, a cycloalkyl group or an aryl group.

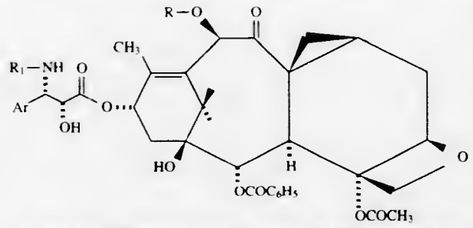
5,587,493

PROCESS FOR PREPARING TAXOIDS

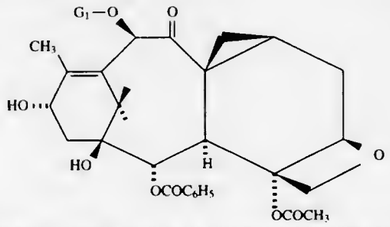
Hervé Bouchard, Ivry Sur Seine; Jean-Dominique Bourzat, Vincennes, and Alain Commercon, Vitry-Sur-Seine, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

Division of Ser. No. 162,984, Dec. 8, 1993. This application Jun. 7, 1995, Ser. No. 487,232
Claims priority, application France, Dec. 9, 1992, 92 14813
Int. Cl.[6] C07D *305/14*
U.S. Cl. 549—510 **32 Claims**

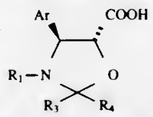
1. A process for preparing a taxoid of formula I:



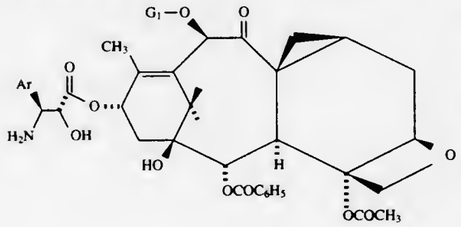
in which R represents a hydrogen atom or an acetyl, alkoxyacetyl, or alkyl radical, R_1 represents a benzoyl radical or a radical R_2—O—CO in which R_2 represents an alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, bicycloalkyl, phenyl or heterocyclyl radical, and Ar represents an aryl radical, comprising the steps of esterifying a compound of the formula VI:



in which G_1 represents a hydrogen atom or an acetyl, alkoxyacetyl or alkyl radical or a hydroxy-protecting group, with a free acid of the formula VII:



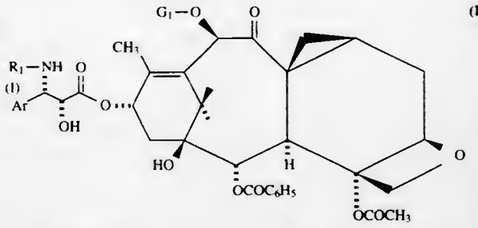
in which Ar and R_1 are as defined above, and R_3 and R_4, which are identical or different, represent an alkyl radical containing 1 to 4 carbon atoms or an aralkyl radical whose alkyl portion contains 1 to 4 carbon atoms or an aryl radical, or R_3 represents a trihalomethyl radical or a phenyl radical substituted by a trihalomethyl radical and R_4 represents a hydrogen atom, or R_3 and R_4 form, together with the carbon atom to which they are attached, a 4- or 7-membered ring, to give, after treating in acidic medium, a compound of the formula IV:



in which Ar and G_1 are as defined above, acylating the compound with benzoyl chloride or a reactive derivative of the formula:

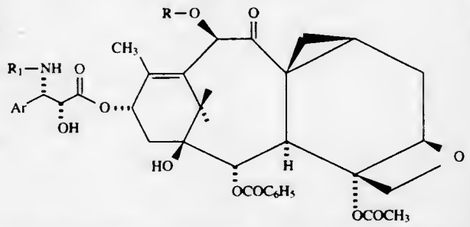
R_2—O—CO—X

in which X represents a halogen atom or a residue —O—R_2 or —O—CO—O—R_2, and R_2 is as defined above, to give a produce of formula I or a compound of formula III



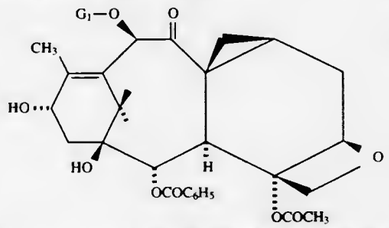
wherein G_1 represents a protecting group that is removed to give a product of formula I.

17. A process for preparing a taxoid of formula I:

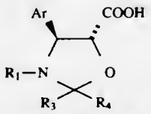


in which R represent a hydrogen atom or an acetyl, alkoxyacetyl, or alkyl radical, R_1 represents a radical R_2—O—CO— in which R_2 represents an alkyl radical, and Ar represents an aryl radical, comprising the steps of

esterifying a compound of the formula VI:



in which G_1 represents a hydrogen atom or an acetyl, alkoxyacetyl or alkyl radical or a hydroxy-protecting group, with a free acid of the formula VII:



in which Ar and R_1 are as defined above, and R_3 and R_4, which are identical or different, represent an alkyl radical containing 1 to 4 carbon atoms or a aralkyl radical whose alkyl portion contains 1 to 4 carbon atoms or an aryl radical, or R_3 represents a trihalomethyl radical or a phenyl radical substituted by a trihalomethyl radical and R_4 represents a hydrogen atom, or R_3 and R_4 form, together with the carbon atom to which they are attached, a 4- or 7-membered ring, to give, after treating in acidic medium, a compound of the formula IV:

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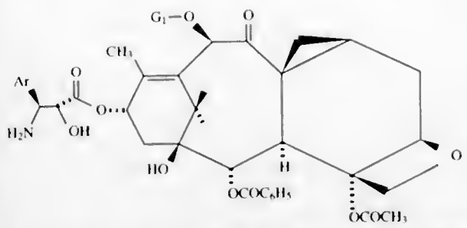
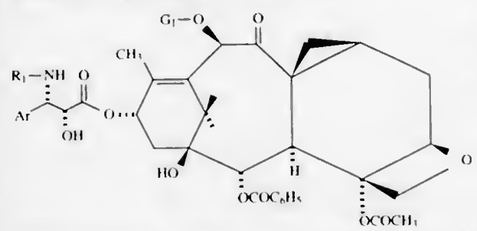


(IV)

in which Ar and G_1 are as defined above, acylating the compound of formula IV with a benzoyl chloride or a reactive derivative of the formula:

R_2—O—CO—X

in which X represents a halogen atom or a residue —O—R_2 or —O—CO—O—R_2, and R_2 is as defined above, to give a produce of formula I or a compound of formula III



(III)

wherein G_1 represents a protecting group that is removed to give a produce of formula I.

5,587,494

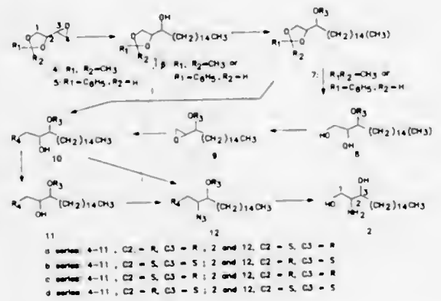
PRACTICAL, COST-EFFICIENT CHIRAL SYNTHESIS OF DIHYDROSPHINGOSINES

Raymond P. Panzica, Narragansett, R.I.; Hussein I. El Sohbagh, Al-Hussnieh, Egypt, and Elie Abushanab, Peace Dale, R.I., assignors to The Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

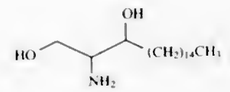
Continuation-in-part of Ser. No. 852,885, Mar. 17, 1992, abandoned. This application Apr. 5, 1993, Ser. No. 42,875

Int. Cl.[6] **C07D** *303/00;* **C07C** *211/00;209/00*

U.S. Cl. 549—512 **4 Claims**



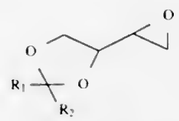
2. A process for the preparation of a compound of the structural formula 2



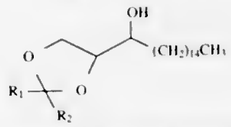
(2)

which comprises:

adding an organomagnesium composition to a compound of the structural formula 4 to form a compound of the structural formula 6.

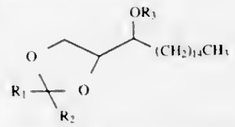


(4)



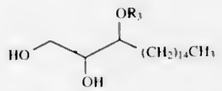
(6)

benzylating a compound of structural formula 6 to form a compound of the structural formula 7



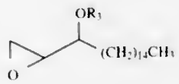
(7)

hydrolyzing 7 with acid to form a compound of the structural formula 8



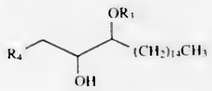
(8)

dehydrating 8 to form a compound of the structural formula 9



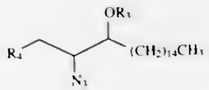
(9)

converting the epoxide of 9 to a corresponding alcohol to form a compound of the structural formula 10



(10)

inverting 10 to form a compound of the structural formula 12



(12)

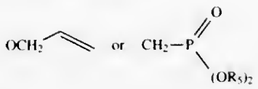
reducing 12 to form the compound 2

where

R_1,R_2 equals CH_3

R_3 equals $Ch_2C_6H_5$ or

R_4 equals $OCH_2C_6H_5$, $OC(CH_3)_3$



R_5 equal C_nH_{2n+1}

where

n=1, 2, or 3.

5,587,495

4-SUBSTITUTED ANTHRACYCLINONES AND ANTHRACYCLINE GLYCOSIDES AND THE PROCESS FOR PREPARING THEM

Walter Cabri; Silvia De Bernardinis, both of Milan; Franco Francalanci, Novara, and Sergio Penco, Milan, all of Italy, assignors to Farmitalia Carlo Erba Srl, Milan, Italy

PCT No. PCT/EP89/01266, § 371 Date Apr. 25, 1991, § 102(e) Date Apr. 25, 1991, PCT Pub. No. WO90/04601, PCT Pub. Date May 3, 1990

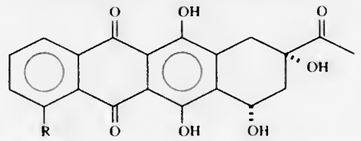
PCT Filed Oct. 24, 1989, Ser. No. 678,352

Claims priority, application United Kingdom, Oct. 25, 1988, 8824947

Int. Cl.[6] **C07H** *15/24*

U.S. Cl. 552—220 **16 Claims**

1. A 4-substituted anthracyclinone of formula (I):



wherein R represents a straight or branched alkenyl of 2 to 4 carbon atoms.

5,587,496

15,15-DIALKYL-SUBSTITUTED DERIVATIVES OF ESTRADIOL

James R. Bull, Cape Town, South Africa; Karl-Heinrich Fritzmeier, and Christa Hegele-Hartung, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

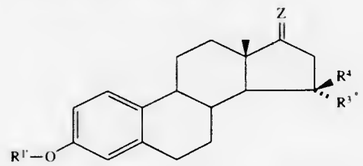
Filed Aug. 2, 1994, Ser. No. 284,786

Claims priority, application Germany, Aug. 2, 1993, 43 26 240.6

Int. Cl.[6] **C07J** *1/00*

U.S. Cl. 552—629 **13 Claims**

1. A compound of formula IIa



(IIa)

wherein

$R^{1'}$is a straight-chain alkyl having 1–10 carbon atoms or a branched-chain alkyl group having 3–10 carbon atoms;

R^3 and R^4, independently of one another, are each a straight-chain alkyl having 1–10 carbon atoms or a branched-chain alkyl having 3–10 carbon atoms; and

Z is an α-hydrogen atom and a β-hydroxy group or a keto-oxygen atom.

5,587,497

19-NOR-VITAMIN D COMPOUNDS

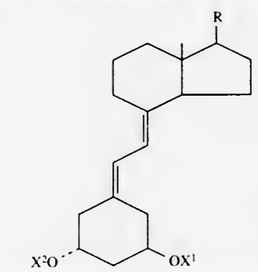
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes; Kato L. Perlman, both of Madison, all of Wis.; Rafal R. Sicinski, Warsaw, Poland, and Jean M. Prahl, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 281,261, Jul. 27, 1994, abandoned, which is a division of Ser. No. 123,485, Sep. 17, 1993, Pat. No. 5,342,975, which is a division of Ser. No. 960,241, Oct. 13, 1992, Pat. No. 5,246,925, which is a continuation of Ser. No. 879,706, May 5, 1992, abandoned, which is a continuation of Ser. No. 557,400, Jul. 3, 1990, abandoned, which is a division of Ser. No. 481,354, Feb. 16, 1990, Pat. No. 5,237,110, which is a continuation-in-part of Ser. No. 321,030, Mar. 9, 1989, abandoned. This application May 16, 1995, Ser. No. 442,492

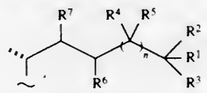
Int. Cl.[6] **C07C** *401/00*

U.S. Cl. 552—653 **12 Claims**

1. A compound having the formula



where X^1 and X^2 are each selected from hydrogen, acyl, alkylsilyl and alkoxyalkyl, and where R is selected from alkyl, hydrogen, hydroxyalkyl, said hydroxyalkyl having from 4 to 5 carbon atoms, fluoroalkyl and a side chain of the formula



wherein R^1 represents hydrogen, hydroxy or O-acyl, R^2 and R^3 are each selected from alkyl, hydroxyalkyl and fluoroalkyl, or, when taken together represent the group —$(CH_2)_m$—where m is an integer having a value of from 2 to 5, R^4 is selected from hydrogen, hydroxy, fluorine, O-acyl, alkyl, hydroxyalkyl and fluoroalkyl, R^5 is selected from hydrogen, fluorine, alkyl, hydroxyalkyl and fluoroalkyl, or R^4 and R^5 taken together represent double-bonded oxygen, R^6 and R^7 are each selected from hydrogen, hydroxy, O-acyl, fluorine and alkyl, or, R^6 and R^7 taken together form a carbon-carbon double bond, and wherein n is an integer having a value of from 1 to 5 and wherein any of the groups -CH(CH_3)-, -CH(R^7)-, or -CH(R^6)- at positions 20, 22 and 23, respectively, may be replaced by an oxygen atom, with the proviso that when n is 2 to 5 each R^4 is independently selected from hydrogen, hydroxy, fluorine, O-acyl, alkyl, hydroxyalkyl and fluoroalkyl, and each R^5 is independently selected from hydrogen, fluorine, alkyl, hydroxyalkyl and fluoroalkyl.

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5,587,498

METHOD FOR AMIDE PREPARATION

James A. Krogh; Anita R. Mokadam, both of Janesville, and B. Brian Smith, McFarland, all of Wis., assignors to Exxon Chemical Patents, Inc., Baytown, Tex.

Continuation of Ser. No. 63, Jan. 4, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 314,454

Int. Cl.[6] C07C *237/00*

U.S. Cl. 554—69 **17 Claims**

1. A method for the batch, continuous, or semi-continuous preparation of amides from carboxylic acids, comprising reacting an amine with a neo carboxylic acid having five to nineteen carbon atoms and which has an α-carbon that is at least trisubstituted, at a molar ratio of about 1:1, at a sufficient temperature of about 220°–350° C. in the presence of at least 0.001 weight percent, based on the reactants, of a catalyst containing a transition metal selected from Groups IVb, Vb, and VIb, said transition metal present on and bound to a solid support.

5,587,499

(METH) ACRYLIC COMPOUNDS, PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION TO THE SYNTHESIS OF NEW POLYMERS

Michèle Curci, Metz; Jean-Luc Mieloszynski, Montigny Les Metz, and Daniel Paquer, Vandoeuvre, all of France, assignors to ELF Atochem S.A., France

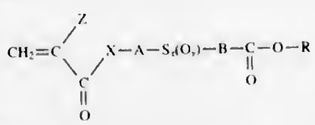
Division of Ser. No. 18,594, Feb. 17, 1993, Pat. No. 5,457,172. This application May 11, 1995, Ser. No. 439,141

Claims priority, application France, Feb. 17, 1992, 92 01748

Int. Cl.[6] C07C *53/126;327/20;69/02*

U.S. Cl. 554—85 **16 Claims**

1. A process for the production of an acrylic compound of the formula (I):



(I)

wherein

Z is H or a linear or branched alkyl radical;

X is O or S;

A and B are each independently an unsubstituted alkylene radical;

R is H, an alkali metal, or a linear or branched alkyl radical;

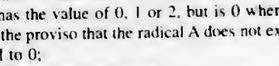
x has the value of 0 or 1; and

y has the value of 0, 1 or 2, but is 0 when x=0,

with the proviso that the radical A does not exist if x and y are both equal to 0;

said process comprising:

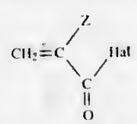
reacting a compound of the formula (II)



(II)

wherein X, A and B are as defined above and Alk is a linear or branched alkyl radical,

with a compound of the formula (III)



(III)

wherein Z is as defined above, and Hal represents a halogen, in order to obtain a compound (I) wherein x=1, y= 0 and R=alkyl (compound Ia);

optionally, further comprising treating said compound (Ia) with H^+ ions to produce a compound (I) wherein x=1, y=0 and R=H (compound Ib);

optionally, further comprising converting said compound (Ib) into a salt to produce a compound (I) wherein x=1, y=0 and R=alkali metal (compound Ic);

optionally, further comprising reacting said compound (Ia) with an oxidizing agent to produce a compound (I) wherein x=1, y=1 or 2 and

R=alkyl (compound Id), the molar ratio of oxidizing agent to compound (Ia) being at least equal to 1 and lower than 2 in order to obtain a sulfoxide, y=1, and at least equal to 2 in order to obtain a sulfone, y=2;

optionally, further comprising treating said compound (Id) with H^+ ions to produce a compound (I) wherein x=1, y=1 or 2 and R=H (compound Ie); and

optionally, further comprising converting said compound (Ie) into a salt to produce a compound (I) wherein x=1, y=1 or 2 and R=alkali metal (compound If).

5,587,500

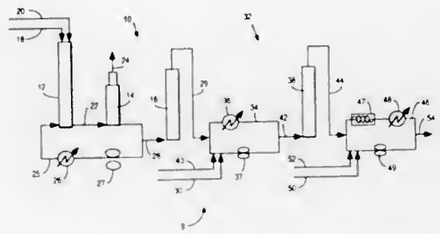
SULFONATION OF FATTY ACID ESTERS

Keith D. Hovda, Kent, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Filed Sep. 17, 1993, Ser. No. 123,448

Int. Cl.[6] C11D *1/28*

U.S. Cl. 554—98 **65 Claims**



1. In a process for preparing a sulfonated fatty acid ester surfactant including the steps of

(a) sulfonating a fatty acid ester thereby producing a crude sulfonic acid;

(b) reacting the crude sulfonic acid with a bleaching agent and an alcohol; and

(c) neutralizing the product formed in step (b);

the improvement comprising the following expedients:

(i) providing process equipment for performing step (b) comprising at least one of a continuous reactor vessel, a recirculation loop, a plug flow reactor, and a pressurized batch reactor vessel, said process equipment made from materials selected from the group consisting of non-metallic materials and low-iron, corrosion resistant alloys, said process equipment being wetted by the sulfonic acid and the bleaching agent during step (b); and

(ii) performing the neutralizing step (c) with a solid base in the presence of solvent in an amount sufficient to form a neutralization mixture in the form of one of a solution and a slurry, said solvent being predominantly alcohol.

5,587,501

PROCESS FOR THE PREPARATION OF SYNDIOTACTIC POLYOLEFINS HAVING A BROAD MOLECULAR WEIGHT DISTRIBUTION

Andreas Winter, Glashütten; Volker Dolle, Kelkheim am Taunus, and Walter Spaleck, Liederbach, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 326,083, Dec. 22, 1994, Pat. No. 5,539,066, which is a continuation of Ser. No. 102,698, Aug. 5, 1993, abandoned, and a continuation of Ser. No. 888,559, May 27, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 473,080

Claims priority, application Germany, May 27, 1991, 41 17 260.4

Int. Cl.[6] C07F *17/00*

U.S. Cl. 556—53 **5 Claims**

1. A metallocene mixture comprising at least two different metallocenes which are encompassed by one or more of the following groups: (arylalkylidene)(9-fluorenyl)(cyclopentadienyl)zirconium R^1R^2, (diarylmethylene)(9-fluorenyl)(cyclopentadienyl)zirconium R^1R^2 or (dialkylmethylene)(9-fluorenyl)(cyclopentadienyl)zirconium R^1R^2 and in which R^1 and R^2 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-alkoxy group, a C_6–C_{10}-aryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10} -alkenyl group, a C_7–C_{40} -arylalkyl group, a C_7–C_{40}-alkylaryl group or C_8–C_{40}-arylalkenyl group.

5,587,502

HYDROXY FUNCTIONAL ALKOXYSILANE AND ALKOXYSILANE FUNCTIONAL POLYURETHANE MADE THEREFROM

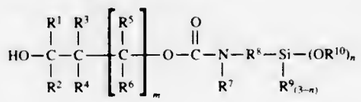
Dean M. Moren, North St. Paul, Minn., and Ian R. Owen, River Falls, Wis., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1995, Ser. No. 460,349

Int. Cl.[6] C07F *7/10*

U.S. Cl. 556—420 **27 Claims**

1. A compound having the structure:



wherein

each R^1, R^2, R^3, R^4, R^5, R^6 and R^9 is independently selected from the group consisting of hydrogen; linear, branched and cyclic alkyl groups having 1 to 18 carbon atoms, optionally comprising 1 to 3 non-terminal oxygen, sulfur, nitrogen or carbonyl groups in the hydrocarbon backbone of the alkyl group and optionally substituted with one or more hydroxyl groups; and aryl groups having 6 carbon atoms, optionally substituted with a halo, nitro or cyano group, or an alkyl, alkyloxy, alkylthio, dialkylamino or carboalkyloxy group each having 1 to 18 carbon atoms; with the proviso that at least one of R^1, R^2, R^3 and R^4 is not hydrogen;

R^7 is selected from the group consisting of hydrogen and linear, branched and cyclic alkyl groups having 1 to 18 carbon atoms, optionally comprising 1 to 3 non-terminal oxygen, sulfur, nitrogen or carbonyl groups in the hydrocarbon backbone of the alkyl group;

R^8 is selected from the group consisting of linear, branched and cyclic alkylene groups having at least two carbon atoms;

R^{10} is selected from the group consisting of linear, branched, and cyclic alkyl groups having at least 2 carbon atoms, optionally comprising 1 to 3 non-terminal oxygen, sulfur, nitrogen or carbonyl groups in the hydrocarbon backbone of the alkyl groups; m is 0, 1 or 2; and n is 1, 2, or 3.

5,587,503

PREPARATION OF SILICON-CONTAINING VINYL ETHERS AND VINYL THIOETHERS

Marc Heider, Neustadt; Jochem Henkelmann, Mannheim, and Michael Karcher, Schwetzingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

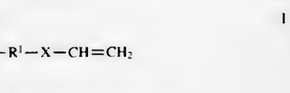
Filed Aug. 24, 1995, Ser. No. 518,718

Claims priority, application Germany, Aug. 27, 1994, 44 30 477.3

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—427 **4 Claims**

1. A process for preparing silicon-containing vinyl ethers and vinyl thioethers of the general formula I



I

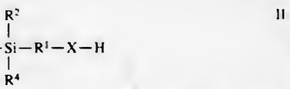
where the variables have the following meanings:

X is oxygen or sulfur,

R^1 is C_1–C_{20}-alkylene, C_3–C_{12}-cycloalkylene or C_6–C_{10}-arylene,

R^2, R^3 and R^4 are hydrogen, C_1–C_{20}-alkyl, C_3–C_{12}-cycloalkyl, C_1–C_{12}-alkoxy, phenoxy, heteroaryl or together with R^1 form a C_3–C_{12}-cycle,

by reaction of silicon-containing alcohols or thiols of the general formula II



II

where the variables have the meaning indicated above, with acetylene, which comprises carrying out the reaction in phenyl methyl sulfoxide, dimethyl sulfoxide, sulfolane or hexamethylphosphoramide in the presence of an alkali metal hydroxide.

5,587,504

SULFONYLOXY-BIPHENYLCARBOXYLIC ESTER DERIVATIVES WHICH ARE INTERMEDIATES

Yoshio Urawa; Ken Furukawa; Toshikazu Shimizu; Yoji Yamagishi, all of Ibaraki; Tomio Tsurugi, Chiba, and Tomio Ichino, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, and Eisai Chemical Co., Ltd., Ibaraki, both of Japan

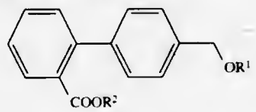
Division of Ser. No. 466,128, Jun. 6, 1995, which is a division of Ser. No. 256,869, Aug. 5, 1994. This application Oct. 19, 1995, Ser. No. 545,484

Claims priority, application Japan, Dec. 7, 1992, 4-351139; Dec. 16, 1992, 4-353865; Jun. 17, 1993, 5-169805; Jun. 17, 1993, 5-169823; Jun. 17, 1993, 5-169824; Jun. 17, 1993, 5-169825

Int. Cl.[6] C07C *409/32*

U.S. Cl. 558—58 **3 Claims**

1. A sulfonyloxy-biphenylcarboxylic ester derivative (I) having the following general formula:



wherein r^1 represents a lower alkylsulfonyl group or an arylsulfonyl group; and R^2 represents a lower alkyl group, an aryl group, an aralkyl group, a cycloether group, an aryloxyalkyl group, an aralkyloxyalkyl group, a thioalkoxyalkyl group or a triphenylmethyl group.

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5,587,505

TRITERPENE DERIVATIVES AND ENDOTHELIN-RECEPTOR ANTAGONISTS CONTAINING THE SAME

Toshiro Konoike, Suita; Yoshitaka Araki, Higashiosaka; Tetsuyoshi Hayashi, Otsu; Kensuke Sakurai, Kitakatsuragi-gun, and Takehiko Tozyo, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

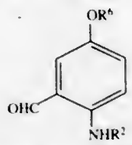
Division of Ser. No. 258,392, Jun. 10, 1994, Pat. No. 5,463,107. This application Jul. 26, 1995, Ser. No. 507,211

Claims priority, application Japan, Jun. 11, 1993, 5-140416

Int. Cl.[6] C07C *69/96;229/34*

U.S. Cl. 558—272 **2 Claims**

1. A compound of the formula (III)



(III)

wherein R^2 is hydrogen or $—R^3-R^4$ wherein R^3 is $—SO_3—$, $—CH_2COO—$, $—COCOO—$, or $—COR^5COO—$ (R^5 is lower alkylene or lower alkenylene), R^4 is hydrogen or lower alkyl, and R^6 is t-butoxycarbonyl or hydrogen, with the proviso that when R^2 is hydrogen, R^6 is not hydrogen, or a pharmaceutically acceptable salt thereof.

5,587,506

PREPARATION OF N-PROTECTED N-ALKYLATED AMINO ACIDS

Klaus Knühl, Limburgerhof; Ulrich Karl, Ludwigshafen; Stefan Müller, Speyer, and Bernd de Potzolli, Bad Dürkheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/03480, § 371 Date Sep. 6, 1995, § 102(e) Date Sep. 6, 1995, PCT Pub. No. WO95/12574, PCT Pub. Date May 11, 1995

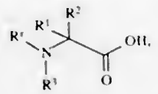
PCT Filed Oct. 22, 1994, Ser. No. 530,310

Claims priority, application Germany, Nov. 2, 1993, 43 37 331.3

Int. Cl.[6] C07C *269/06*

U.S. Cl. 560—12 **4 Claims**

1. A process for preparing N-protected N-alkylated amino acids of the formula I



I

where

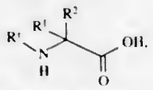
R^1 is a conventional protective group for peptide synthesis,

R^1 is the side chain of a proteinogenous amino acid or a functional derivative thereof,

R^2 is hydrogen, C_{1-6}-alkyl, C_{2-6} -alkenyl, C_{2-6}-alkynyl or unsubstituted or C_{1-4}-alkyl-substituted phenyl or benzyl, and

R^3 is methyl or ethyl,

which comprises adding a compound of the formula II:



II

where R^1, R^2 and R^5 have the abovementioned meanings, to a solution of sodium or potassium tert-butanolate in a non-protic organic solvent and subsequently adding dimethyl or diethyl sulfate.

5,587,507

SYNTHESIS OF TYROSINE DERIVED DIPHENOL MONOMERS

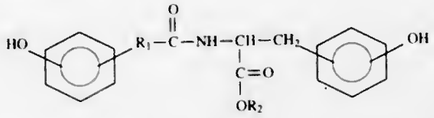
Joachim B. Kohn, Highland Park, and Kimberly A. Hooper, Long Valley, both of N.J., assignors to Rutgers, The State University, Piscataway, N.J.

Filed Mar. 31, 1995, Ser. No. 414,339

Int. Cl.[6] C07C *229/28;229/34*

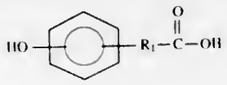
U.S. Cl. 560—40 **18 Claims**

1. A method for preparing diphenol compounds having the formula:

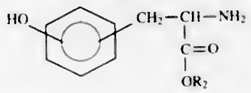


wherein R_1 is —CH=CH— or $(—CH_2—)_n$, in which n is zero or an integer from one to eight; and R_2 is selected from the group consisting of straight and branched alkyl and alkylaryl groups containing up to 18 carbon atoms; which method comprises the steps of:

coupling a hydroxyphenyl carboxylic acid having the formula:



with a L-tyrosine ester having the formula:



in a water-miscible organic reaction solvent containing a carbodiimide capable of forming a water-soluble urea by-product to form a diphenol reaction product;

combining the reaction mixture with an amount of water effective to precipitate the diphenol as a water-immiscible organic phase, so that a water-immiscible organic phase is formed containing the diphenol reaction product and a water-miscible phase is formed containing predominately reaction side-products and contaminants.

5,587,508

PROCESS FOR PRODUCING 2,6-NAPHTHALENEDICARBOXYLIC ACID AND ESTER THEREOF

Hiroshi Machida, Okayama-ken, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 3, 1996, Ser. No. 580,974

Claims priority, application Japan, Jan. 11, 1995, 7-002708

Int. Cl.[6] C07C *67/00;51/215*

U.S. Cl. 560—77 **4 Claims**

1. A process for producing 2,6-naphthalenedicarboxylic acid, which comprises oxidizing a 2,6-dialkylnaphthalene with a gas containing molecular oxygen in a solvent containing a lower aliphatic carboxylic acid in the presence of a catalyst comprising heavy metal compounds and a bromine compound, wherein an ester mixture containing dimethyl 2,6-naphthalenedicarboxylate is added to the oxidation reaction.

5,587,509

CAGED CABOXYL COMPOUNDS AND USE THEREOF

George P. Hess, Ithaca; Barry K. Carpenter, Slaterville Springs, both of N.Y.; Doraiswamy Ramesh, San Diego, Calif., and Raymond Wieboldt, Freeville, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 159,190, Nov. 30, 1993, Pat. No. 5,430,175. This application Mar. 8, 1995, Ser. No. 400,750

Int. Cl.[6] C07C *69/00*

U.S. Cl. 560—130 **8 Claims**

1. A method of releasing a caged carboxylic acid to a receptor having receptor channels comprising:

(a) preparing a caged carboxylic acid with a cage group comprising 2-alkoxy-5-nitrophenyl wherein the alkoxy group contains about 1–4 carbon atoms;

(b) photolyzing the protecting group with light to release the caged carboxylic acid; and

(c) contacting a receptor with the released carboxylic acid.

5,587,510

(S)-2-ARALKYL-3-CHLOROPROPIONIC ACID AND PROCESS FOR THE PREPARATION THEREOF

Masao Konno, and Yosbifumi Yuasa, both of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

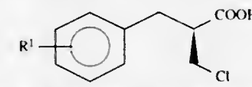
Filed May 23, 1995, Ser. No. 448,310

Claims priority, application Japan, May 25, 1994, 6-133924

Int. Cl.[6] C07C *53/134*

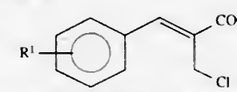
U.S. Cl. 562—496 **5 Claims**

1. A process for the preparation of a (S)-2-aralkyl-3-chloropropionic acid represented by the general formula



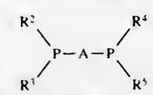
(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group, which comprises asymmetrically hydrogenating a (Z)-2-aralkylidene- 3-chloropropionic acid represented by the general formula (II):



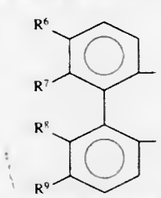
(II)

wherein R^1 is as defined above with a complex of a bidentate phosphine represented by the general formula (III):



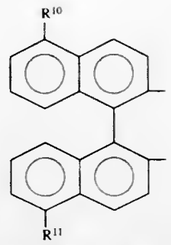
(III)

wherein R^2, R^3, R^4 and R^5 may be the same or different and each represent a phenyl group, a cyclohexyl group, a cyclopentyl group, or a substituted phenyl group substituted with a lower alkyl group, a lower alkoxy group or a halogen atom; and A is represented by the general formula (IV) or (V):



(IV)

wherein R^6 and R^9 each represent a hydrogen atom; and R^7 and R^8 each represent a methyl group; or R^6 forms a tetramethylene group with R^7, and R^8 forms an another tetramethylene group with R^9;



(V)

wherein R^{10} and R^{11} may be the same or different and each represent a hydrogen atom, an amino group, an acetylamino group, or $—SO_3M$ (in which M represents a hydrogen atom or an alkaline metal atom), with ruthenium as a catalyst, in the presence of a tertiary amine represented by the general formula (VI):

$$NR^{12}R^{13}R^{14} \quad \text{(VI)}$$

wherein

R^{12}, R^{13} and R^{14} may be the same or different and each represent a lower alkyl group.

5,587,511

PROCESS FOR OBTAINING ADIPIC ACID

Herbert Salzburg, Leichlingen; Georg Steinhoff, Krefeld; Andreas Gosch, Bochum, and Gerd Hufen, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1995, Ser. No. 556,572

Claims priority, application Germany, Nov. 18, 1994, 44 41 175.8

Int. Cl.[6] C07C *51/00*

U.S. Cl. 562—513 **4 Claims**

1. A process for obtaining adipic acid from the aqueous nitric acid mother liquor that arise during industrial adipic acid production, said mother liquor containing about 2 to about 8 wt. % of succinic acid, about 4 to about 10 wt. % of glutaric acid, and about 2 to about 25 wt. % of adipic acid and an HNO_3 concentration of 40 to 60 wt. % (relative to the aqueous nitric acid without including said succinic, glutaric, and adipic acids), comprising

(i) removing nitric acid from the aqueous mother liquor by evaporation to a concentrate having a residual content of at most 2.5 wt. % of HNO_3, relative to the weight of the evaporation residue,

(ii) mixing the concentrate obtained according to step (i) with water or aqueous nitric acid having an HNO_3 content of at most 10 wt. % in a quantity corresponding to a weight ratio of solid to liquid of 1:2.1 to 1:1.2,

(iii) allowing the water added in step (ii) or the nitric acid added in step (ii) to act upon the concentrate for a period of at least 10 minutes at 20° to 80° C., optionally with continuous mixing and optionally with at least partial dissolution of the concentrate, and

(iv) separating adipic acid as crystals from the liquid phase of step (iii), said crystals of adipic acid being formed either (1) during step (iii) when temperatures in step (iii) are no more than about 35° C. or (2) after step (iii) when temperatures in step (iii) are greater than about 35° C. by cooling the mixture from step (iii) to 10° to 35° C.

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5,587,512

PROCESS FOR OBTAINING [S,S]-ETHYLENEDIAMINE-N,N'-DISUCCINIC ACID FROM A SALT SOLUTION OF SUCH ACID AND L-ASPARTIC ACID

Ronny W. Lin, Baton Rouge; Eldon E. Atkinson, Jr., Greenwell Springs, and Donald E. Balhoff, Baton Rouge, all of La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jul. 11, 1994, Ser. No. 272,457

Int. Cl.[6] C07C *229/00*

U.S. Cl. 562—565 **12 Claims**

1. A method for obtaining [S,S] ethylenediamine-N,N'-disuccinic acid from an aqueous solution containing [S,S] ethylenediamine-N,N'-disuccinic acid salt and L-aspartic acid salt by co-feeding, to a volume of water, (1) the aqueous solution and (2) an aqueous mineral acid having a dissociation constant within the range of from about 1.0×10^{-5} to about 1.0×10^{10}, wherein the feed rates of the aqueous solution and the aqueous mineral acid are controlled so that the volume of water has a pH within the range of from about 2 to about 6.5 at least substantially throughout the co-feed period.

5,587,513

POLYETHER-SUBSTITUTED IMIDE COMPOUNDS AND THEIR USE

Klaus Pohmer; Rainer Weber; Cornelia Dörzbach-Lange; Reinhard Halda, and Hans-Heinrich Moretto, all of Bayer AG, D 51368 Leverkusen, Bayerwerk, Germany

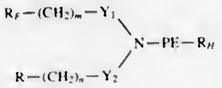
Continuation-in-part of Ser. No. 150,722, Nov. 12, 1993, Pat. No. 5,414,120. This application Jan. 20, 1995, Ser. No. 375,647

Claims priority, application Germany, Nov. 27, 1992, 42 40 008.2

Int. Cl.[6] C07C *311/01*

U.S. Cl. 564—84 **6 Claims**

1. Imide compounds containing at least one of fluoroalkyl and fluoroaryl groups, which compounds are of the general formula (I):



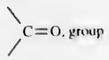
(I)

in which

R_F is a linear or branched fluoroalkyl residue with 1 to 18 carbon atoms, a fluoroaryl residue with 6 to 12 carbon atoms, a mixed fluoroalkylaryl residue with 7 to 18 carbon atoms or a fluorinated mono or polyether with 2 to 18 carbon atoms,

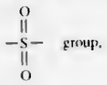
R is (i) a linear or branched alkyl residue with 1 to 24 carbon atoms, an aryl residue with 6 to 12 carbon atoms or a mixed alkylaryl residue with 7 to 24 carbon atoms, wherein the carbon chain may also be interrupted by oxygen, nitrogen or sulphur atoms, or (ii) a further residue R_F as defined above, wherein the two R_F residues may be the same or different,

each of Y_1 and Y_2 represent a



C=O, group

or Y_1 represents a >C=O group and Y_2 represents a



group,

m is an integer from 0 to 6,

n is an integer from 0 to 6 and

PE is a polyether chain consisting of 5 to 50 ethylene oxide units or 5 to 50 propylene oxide units or a mixture of 5 to 50 ethylene oxide and propylene oxide units and

R_H is a hydrogen atom or a linear or branched alkyl residue with 1 to 10 carbon atoms.

5,587,514

DIASTEREOSELECTIVE SYNTHESIS OF HYDROXYETHYLENE DIPEPTIDE ISOSTERES

Dennis C. Liotta, McDonough, and Bharat R. Lagu, Atlanta, both of Ga., assignors to Emory University, Atlanta, Ga.

Filed Nov. 8, 1993, Ser. No. 148,990

Int. Cl.[6] C07C *231/18*

U.S. Cl. 564—134 **21 Claims**

1. A process for the preparation of a (4S,5S)-hydroxyethylene dipeptide isostere comprising the step of reacting the enolate of α-N,N-di(protected)amino methyl ketone with a compound selected from the group consisting of α-(leaving group)-acetate and α-(leaving group)-acetamide, wherein the amino protecting groups are capable of controlling the facial selectivity of reaction of the enolate.

5,587,515

METHOD OF MANUFACTURING N-MONOSUBSTITUTED (METH)ACRYLAMIDES

Yuulchi Takao, and Hidetoshi Oogami, both of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01511, § 371 Date Jul. 22, 1994, § 102(e) Date Jul. 22, 1994, PCT Pub. No. WO94/08946, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 20, 1993, Ser. No. 256,012

Claims priority, application Japan, Oct. 21, 1992, 4-305860

Int. Cl.[6] C07C *231/02*

U.S. Cl. 564—135 **7 Claims**

1. A method of manufacturing N-monosubstituted (meth)acrylamide represented by formula (I):

$$CH_2{=}CRCO{-}NHQ \qquad \text{(I)}$$

in which R is a hydrogen atom or methyl and Q is an alkyl having 1–12 carbons, a dimethylaminoalkyl having 1–5 carbons or a hydroxyalkyl having 1–3 carbons, characterized in that

(1) (meth)acrylate represented by formula (II):

$$CH_2{=}CRCOOR' \qquad \text{(II)}$$

in which R is a hydrogen atom or methyl and R' is a lower alkyl, is made to react with dialkylamine represented by formula (III):

$$R^1R^2NH \qquad \text{(III)}$$

in which R^1 and R^2 are lower alkyls;

(2) the resulting beta-dialkylamino(1-methyl)propionate represented by formula (IV):

$$R^1R^2N{-}CH_2{-}CHRCOOR' \qquad \text{(IV)}$$

in which R is a hydrogen atom or methyl; R' is a lower alkyl; and R^1 and R^2 are lower alkyls, is made to react, in the presence of an alkali metal alkoxide, with a primary amine represented by formula (V):

$$NH_2{-}Q \qquad \text{(V)}$$

in which Q is an alkyl having 1–12 carbons, a dimethylaminoalkyl having 1–5 carbons or a hydroxyalkyl having 1–3 carbons; and

(3) the resulting N-monosubstituted beta-dialkylamino(1-methyl)propionamide represented by formula (VI):

$$R^1R^2N{-}CH_2{-}CHRCO{-}NHQ \qquad \text{(VI)}$$

in which R is a hydrogen atom or methyl; R^1 and R^2 are lower alkyls; and Q is an alkyl having 1–12 carbons, a dimethylaminoalkyl having 1–5 carbons or a hydroxyalkyl having 1–3 carbons, is subjected to thermal decomposition.

5,587,516

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING PYRENYLAMINE DERIVATIVE, THE PYRENYLAMINE DERIVATIVE, INTERMEDIATE FOR PREPARATION THEREOF, AND METHOD FOR PREPARING THE PYRENYLAMINE DERIVATIVE AND THE INTERMEDIATE

Chiaki Tanaka, Shizuoka-ken; Masaomi Sasaki, Susono; Tamotsu Aruga, Mishima; Tomoyuki Shimada, Shizuoka-ken, and Hiroshi Adachi, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

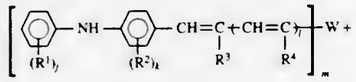
Division of Ser. No. 427,124, Apr. 24, 1995, which is a division of Ser. No. 260,920, Jun. 15, 1994, Pat. No. 5,459,275, which is a continuation-in-part of Ser. No. 77,444, Jun. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 996,080, Dec. 23, 1992, Pat. No. 5,344,985. This application Jun. 5, 1995, Ser. No. 463,739

Claims priority, application Japan, Dec. 28, 1991, 3-360363; Apr. 15, 1992, 4-121326; Jun. 8, 1992, 4-173818; Jun. 17, 1992, 4-183142; Jul. 17, 1992, 4-213528; Jul. 17, 1992, 4-213529; Aug. 10, 1992, 4-234323; Dec. 3, 1992, 4-350440; Jun. 15, 1993, 5-168513

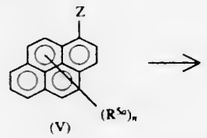
Int. Cl.[6] C07C *209/10*

U.S. Cl. 564—405 **1 Claim**

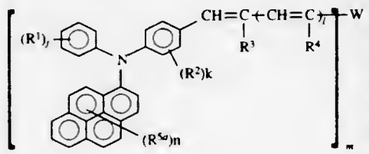
1. A method of preparing a pyrenylamine derivative of formula (Ia) comprising the step of allowing a secondary amine compound of formula (IV) to react with a pyrene compound of formula (V) in accordance with the following reaction scheme:



(IV)



(V)



(Ia)

wherein R^1 and R^2 each represent hydrogen, a halogen atom, nitro group, cyano group, a dialkylamino group, an alkyl group having 1 to 10 carbon atoms, an alkoxyl group having 1 to 10 carbon atoms, or a phenyl group; R^3 and R^4 each represent hydrogen, cyano group, formyl group, an alkoxycarbonyl group, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 1 to 10 carbon atoms, or a phenyl group; R^{5a} represents hydrogen, or an alkyl group having 1 to 10 carbon atoms; W represents hydrogen, an alkyl group having 1 to 10 carbon atoms, a phenylthio group, a bivalent chain unsaturated hydrocarbon group, a monovalent or bivalent carbocyclic aromatic group, or a monovalent or bivalent heterocyclic hydrocarbon group; and j is an integer of 1 to 5, k is an integer of 1 to 4, l is an integer of 0 to 2, m is an integer of 1 or 2, n is an integer of 1 to 3, provided that when j, k or n is 2 or more, R^1, R^2, or R^{5a} may be the same or different; and Z represents a halogen atom.

5,587,517

PROCESS FOR THE PREPARATION OF CHLOROPHENYLPHOSPHANES

Guido Scholz, Köln, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 147,331, Nov. 3, 1993, abandoned. This application Nov. 1, 1994, Ser. No. 332,909

Claims priority, application Germany, Nov. 17, 1992, 42 38 711.6

Int. Cl.[6] C07F *9/52*

U.S. Cl. 568—16 **5 Claims**

1. A process for the preparation of chlorophenylphosphanes of the formula

$$(C_6H_5)_nPCl_{3-n}$$

in which n is 1 or 2, which comprises introducing liquid triphenylphosphane and gaseous phosphorus trichloride in a molar ratio of 1:(3 to 12) at the upper end of a vertically arranged, elongated reaction gone having temperatures of 350° to 650° C. in the reaction zone, transferring the reaction product discharged at the lower end of the reaction zone to a residence zone charged with phosphorus pentachloride, removing excess phosphorus trichloride from the reaction product, via a subsequent fractioning zone, by heating the residence zone with the resultant formation of a PCl_3-depleted reaction product, and separating the substances contained in the PCl_3-depleted reaction product by fractionated rectification under reduced pressure.

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5,587,518

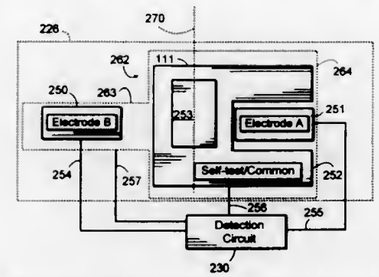
ACCELEROMETER WITH A COMBINED SELF-TEST AND GROUND ELECTRODE

Paul E. Stevenson, Colorado Springs, Colo.; Craig H. Stephan, Ann Arbor; Amer M. Samman, Dearborn, both of Mich., and Leland J. Spangler, Manitou Springs, Colo., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1994, Ser. No. 363,767

Int. Cl.[6] **G01P** *21/00;15/125*

U.S. Cl. 73—1 D **9 Claims**



1. A micro-machined accelerometer, operable in a first mode to detect an acceleration force, and in a second mode to test the operability of the accelerometer, comprising:

a substrate;

a moveable plate held at a fixed electrical potential and substantially parallel to and above said substrate, comprising,

an aperture,

a pedestal positioned within said aperture, and connected to said substrate; and

means for connecting said pedestal to at least one edge of said aperture, to allow said moveable plate to rotate, relative to said substrate, about a flexure axis, in the presence of a force normal to said substrate;

a first electrode formed upon said substrate which receives an AC voltage during said first mode and said second mode;

a second electrode formed upon said substrate at a position opposite of said flexure axis from said first electrode, said second electrode receiving a voltage substantially similar to said AC voltage during said first and said second modes; and

a third electrode formed upon said substrate to surround said aperture and extend on at least two opposing sides around said second electrode, said third electrode having an electrical potential substantially equal to said fixed electrical potential of said substrate during said first mode, and at a different electrical potential during said second mode to perform a self-test of the accelerometer.

5,587,519

PROCESS AND DEVICE FOR SUPPLYING GAS TO AN ANALYZER OF TRACES OF IMPURITIES IN A GAS

Catherine Ronge, Paris; Alain Mail, Draveil, and Yves Marot, Buc, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 9, 1995, Ser. No. 370,294

Claims priority, application France, Jan. 7, 1994, 94 00120

Int. Cl.[6] **G01N** *33/00*

U.S. Cl. 73—1 G **7 Claims**

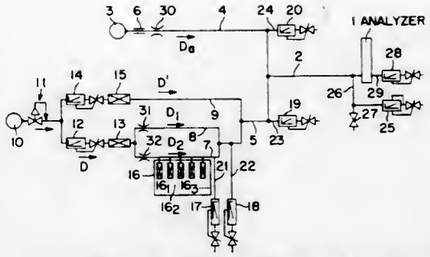
1. A process for supplying a gas to an analyzer for measuring traces of impurities in the gas comprising supplying said analyzer with

(i) a gas to be analyzed;

(ii) a pure gas; and

(iii) a standardizing gas obtained by dilution of one or more impurities in said pure gas as follows:

(A) dividing a flow of pure gas into a set of at least first and second bypass lines, arranged in parallel, each of said bypass lines having an entry including a calibrated restriction, the flow rate of pure gas fed into said set of bypass lines being regulated by a flow regulator placed upstream of the set,



(B) charging the pure gas of the first bypass line with a predetermined quantity of at least one impurity to obtain, after dilution with the pure gas of the second bypass line, a flow of the standardizing gas, which is directed from an exit of said set of bypass lines towards the analyzer along a feed line, wherein the gas to be analyzed, the pure gas, and the standardizing gas flow continuously.

5,587,520

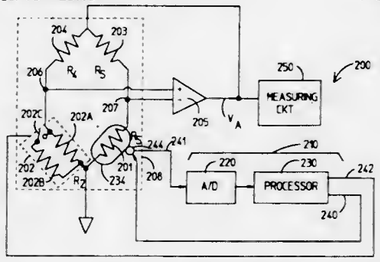
THERMAL CONDUCTIVITY DETECTOR

Robert P. Rhodes, Lincoln University, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1995, Ser. No. 537,182

Int. Cl.[6] **G01N** *25/18*

U.S. Cl. 73—25.03 **7 Claims**



1. A thermal conductivity detector for detecting the thermal conductivity of a sample fluid, comprising:

a cavity wall defining a cavity for receiving a quantity of the sample fluid, said cavity wall having a cavity wall temperature;

a sensor located in said cavity and connected as a first element in a bridge circuit configuration, said sensor having a sensor resistance which is dependent on a temperature of said sensor;

a selectable resistor having a selectable resistance in response to a resistor control signal, the selectable resistor being connected in said bridge circuit configuration as a second element wherein the resistance of said selectable resistor controls the temperature of said sensor;

signal providing means, connected to said sensor, for providing an output signal which is related to a change in the power delivered to said sensor and thereby representative of the thermal conductivity of the sample fluid;

heating means for providing a temperature sense signal representative of the cavity wall temperature and for controlling the cavity wall temperature in response to a heating control signal; and

a controller connected to said selectable resistor and said heating means for;

a. receiving said temperature sense signal,

b. determining a desired cavity wall temperature, a desired sensor temperature, and a respective temperature differential therebetween;

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c. and in response, providing said heating control signal to effect said desired cavity wall temperature and providing the resistor control signal to effect the selected resistance of the selectable resistor so as to establish the desired temperature of the sensor;

whereby the desired temperature differential may be established between the temperature of the sensor and the temperature of the cavity wall.

5,587,521

PIPE TESTING SYSTEM

Douglas Lanasa, P.O. Box 753, Channelview, Tex. 77530

Continuation of Ser. No. 188,023, Jan. 28, 1994, Pat. No. 5,481,902. This application Sep. 5, 1995, Ser. No. 523,450

Int. Cl.[6] G01M *3/28*

U.S. Cl. 73—49.1 **9 Claims**

1. A pipe testing system, comprising:

a mobile platform adapted to be transported to a remote location;

a container means for retaining a discrete quantity of a test fluid, said container means being supported by the platform;

a pair of test plugs for engaging interior surfaces of the respective opposite ends of a pipe being tested, said plugs being fluidly connected to the container means;

a means being carried by the platform for moving the pipe, said means comprising a first conveyor means for delivering the pipe to a pre-test station, a lifting arm means for transporting the pipe to a testing cradle and to a holding station, and a second conveyor means for removing the pipe from a holding station;

a means for inserting at least a portion of the test plugs into a fitted engagement within the interior surfaces of the pipe ends;

a means for delivering the test fluid into the pipe;

a means mounted on the platform for applying pressure to the interior of the pipe; and

an independent power source.

5,587,522

MULTIPLE-PART AND/OR SUPPORTED GAS-CONTAINING VESSEL TO ESTABLISH DESIRED HEAT FLUX

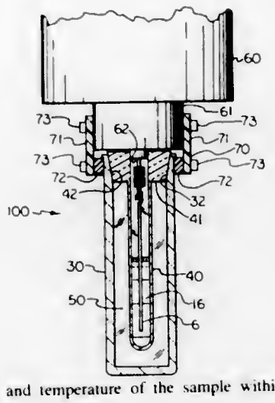
Theodore W. Selby, 4402 Arbor Dr., Midland, Mich. 48640

Filed Dec. 26, 1995, Ser. No. 577,969

Int. Cl.[6] F25D *23/06;1/00;* **B65D** *81/38*

U.S. Cl. 73—54.28 **22 Claims**

1. A heat-insulating vessel comprising a sealable, outer housing and a sample compartment generally enclosed therein such that a hollow portion between walls of at least a part of the housing and sample compartment is present which can contain a predetermined quantity of a gas selected to have a known, predetermined value for a heat flux and which is supported within the housing by at least one peak in the vessel and/or by an added, thermally-insulative insert, said vessel being useful in heat transmission regulation therethrough between a sample, which can be provided within the sample compartment, and an external bath environment at a temperature T, said hollow portion with its predeterminable quantity of a gas therein able to provide for a desired heat flux therethrough towards or away from the sample depending upon factors including those associated with the predeterminable quantity of a gas therein, the temperature T of the external bath



environment, and temperature of the sample within the sample compartment.

5,587,523

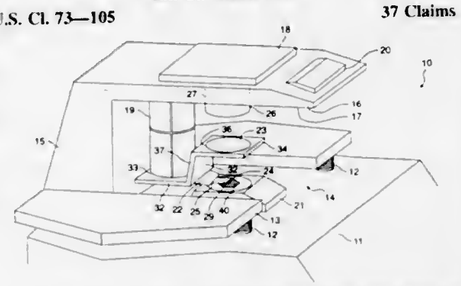
ATOMIC FORCE MICROSCOPE EMPLOYING BEAM TRACKING

Pan S. Jung, Gilbert, and Daphna R. Yaniv, Scottsdale, both of Ariz., assignors to Molecular Imaging Corporation

Continuation of Ser. No. 190,948, Feb. 3, 1994, Pat. No. 5,440,920. This application Feb. 15, 1995, Ser. No. 427,353

Int. Cl.[6] G01B *5/28*

U.S. Cl. 73—105 **37 Claims**



1. A scanning force microscope for examining surface properties of a sample surface, said microscope comprising:

a frame;

a sample stage;

a scanner element having a scanner end capable of motion relative to said frame in response to signals applied to said scanner element;

a cantilever having a reflective back surface, a first cantilever end and a second cantilever end, said first cantilever end having a sharp probe tip extending therefrom toward said sample stage, said second cantilever end coupled to said scanner;

at least one beam tracking element held in a fixed relationship to a portion of said scanner element;

a source of a collimated light beam, said source arranged to project said collimated light beam to said at least one beam tracking element and from said at least one beam tracking element to said reflective back surface of said cantilever forming a reflected light beam emanating from said reflective back surface; and

a position sensitive detector positioned to intercept said reflected light beam and produce a signal responsive to angular movement of said reflected light beam.

5,587,524

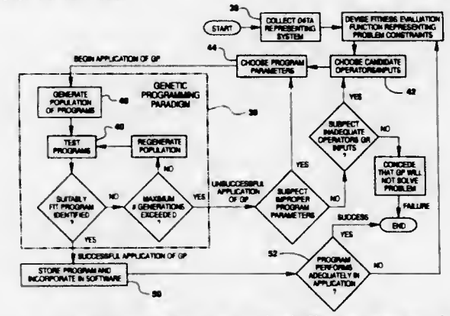
MISFIRE DETECTION ASSEMBLY

Richard J. Hampo, Livonia; Kenneth A. Marko, Ann Arbor, and Bruce D. Bryant, Royal Oak, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1995, Ser. No. 433,186

Int. Cl.[6] G01M *15/00;* **G06F** *15/20*

U.S. Cl. 73—116 **7 Claims**



1. A method for creating an optimal filter to separate data collected from an internal combustion engine from a plurality of usable filters, the method comprising the steps of:

collecting data from the internal combustion engine;

operating each of the plurality of usable filters with the data collected to separate the data into a proper firing category and a misfire category;

separating the data into a false positive category and a false negative category;

modifying a portion of the plurality of usable filters to create a new population of usable filters;

testing each of the new population of usable filters to identify the optimal filter to be used on-board a motor vehicle to accurately detect misfire events created by the internal combustion engine;

weighting the data in the false positive category greater than the data in the false negative category; and

measuring the accuracy of each of the new population of usable filters based on the weighted false positive category and the weighted false negative category.

5,587,525

FORMATION FLUID FLOW RATE DETERMINATION METHOD AND APPARATUS FOR ELECTRIC WIRELINE FORMATION TESTING TOOLS

Than Shwe, and John M. Michaels, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 48,814, Jun. 16, 1993, Pat. No. 5,473,939, which is a continuation-in-part of Ser. No. 903,088, Jun. 19, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 429,722

Int. Cl.[6] E21B *47/06*

U.S. Cl. 73—15.52 **7 Claims**

1. An apparatus for withdrawing a fluid sample from an earth formation penetrated by a wellbore, comprising:

an elongated housing adapted to traverse said wellbore;

a probe disposed within said housing and adapted to be selectively placed in contact with said earth formation;

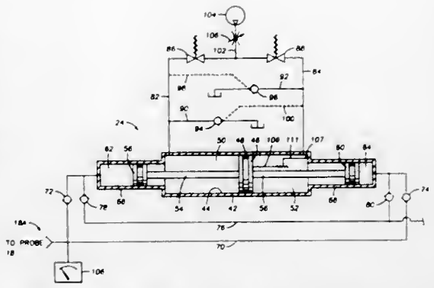
a pumping chamber disposed within said housing and selectively placed in hydraulic communication with said probe, said pumping chamber having a selectively controllable volume;

a pressure transducer disposed within said housing and in hydraulic communication with said probe;

means for selectively increasing and selectively decreasing said volume of said pumping chamber;

means for measuring said volume of said pumping chamber; and

means for recording measurements of said volume of said pumping chamber and pressure measurements made by said



transducer with respect to time so that a measurement of a volume of fluid withdrawn through said probe into said pumping chamber can be determined exclusive of an expansion volume of fluid from said wellbore disposed within said probe prior to initiation of withdrawal of said fluid sample.

5,587,526

PROOF MASS SUPPORT AND SENSING SYSTEM

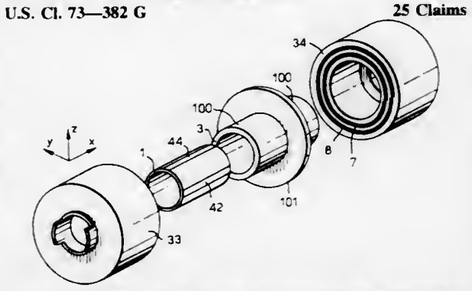
John M. Lumley, Cambridge, United Kingdom, and Ho J. Paik, College Park, Md., assignors to Oxford Instruments (UK) Limited, Oxon, England

Filed Mar. 24, 1995, Ser. No. 409,300

Claims priority, application United Kingdom, Mar. 30, 1994, 9406347; Sep. 28, 1994, 9419649

Int. Cl.[6] G01V *7/02*

U.S. Cl. 73—382 G **25 Claims**



1. A proof mass support system comprising a pair of alignment coils for controlling the rest position of an elongate proof mass, wherein said alignment coils are constructed to provide a levitation force when they carry electric currents which varies along the length of said proof mass; and means for tuning the relative strength of said electric currents in said alignment coils to cause said proof mass to take up a predetermined orientation with respect to one or more degrees of freedom defined by said alignment coils.

5,587,527

HANDHELD DENSITY METER

Neal T. Radford, 2119A Lakepark Dr., Smyrna, Ga. 30080, and Roy J. Waddle, 2262K Northwest Pkwy., Marietta, Ga. 30067

Continuation of Ser. No. 59,104, May 10, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,230

Int. Cl.[6] G01N *9/28*

U.S. Cl. 73—439 **14 Claims**

1. In a density meter comprising a gas pump; a tube assembly including an elongated first bubble tube defining a first tube interior into which the gas pump discharges and an elongated second bubble tube defining a second tube interior into which the gas pump also discharges, wherein the first bubble tube includes a first outlet and the second bubble tube includes a second outlet, and

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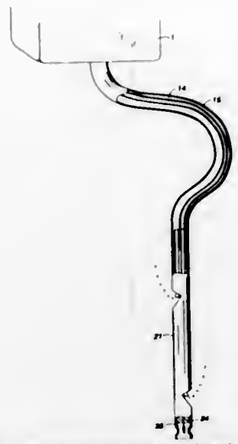


wherein the first outlet is located at a first elevation and the second outlet is located at a second elevation that is different from the first elevation when the first bubble tube is oriented vertically with the second bubble tube; a pressure measuring assembly cooperating with the first tube interior and the second tube interior for measuring a differential pressure defined between the first tube interior and the second tube interior; and a readout device for visually displaying data that corresponds to the differential pressure; wherein the improvement comprises:

the density meter further comprising an enclosure structure constructed and arranged to be handheld, wherein said enclosure structure houses the gas pump, the pressure measuring assembly, and the readout device,

the tube assembly extending from said enclosure structure and being constructed and arranged so that an elongated section of the second bubble tube is disposed within an elongated section of the first tube interior.

5,587,528

APPARATUS AND METHOD FOR CORRECTING UNBALANCE ON A MOTOR VEHICLE WHEEL

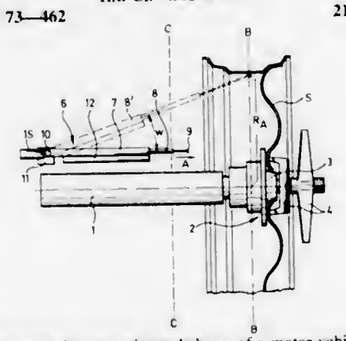
Karl Rothamel, Seeheim-Jugenheim; Lorenz Lenhardt, Griesheim, and Gottfried Kühn, Weiterstadt, all of Germany, assignors to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Germany

Filed May 26, 1995, Ser. No. 450,500

Claims priority, application Germany, Jul. 26, 1994, 44 26 482.8

Int. Cl.[6] G01M *1/32*

U.S. Cl. 73—462 **21 Claims**



1. Apparatus for correcting unbalance of a motor vehicle wheel by at least one balancing weight, comprising: a sensing means for sensing a predetermined position on the wheel by being displacable toward and away from said wheel; a position detecting means connected to the sensing means for detecting the position thereof; a storage means connected to the position detecting means for storing position data determining actual balancing positions on the wheel; an electronic evaluation means connected to a measuring arrangement for measuring unbalance means connected to a measuring arrangement for measuring unbalance and to said storage means, for determining the balancing position and the magnitude of a balancing weight to be fixed to the wheel; a comparison means connected to said storage means and said position detecting means; a member operatively connected to said sensing means and which is movable therewith when said sensing means is displaced; and a clamping device adapted to at least partially hold said member in response to receipt of a clamping signal from said comparison means in a retrieval mode upon the attainment of a position of the sensing means which is determined by a stored balancing position.

5,587,529

ANGULAR RATE DETECTOR

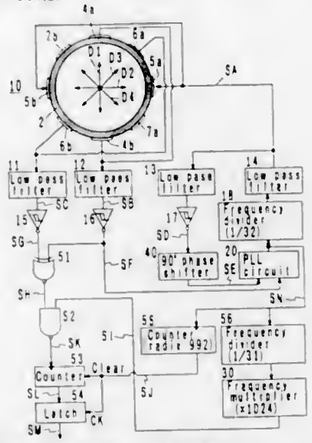
Yutaka Iguchi, Chita-gun; Kazuo Sato, Toyota; Toshihiro Kobayashi, and Masayuki Sato, both of Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 5, 1995, Ser. No. 461,743

Claims priority, application Japan, Jun. 3, 1994, 6-122229; Jun. 14, 1994, 6-132048; Sep. 28, 1994, 6-232674

Int. Cl.[6] G01P *9/04*

U.S. Cl. 73—504.13 **7 Claims**



1. An angular rate detector comprising:

an oscillator including a first terminal to which a drive voltage is applied, a second terminal where a signal occurs having a given phase displacement with respect to a signal appearing at the first terminal during a resonance of the oscillator, and a third terminal where a signal occurs having a phase which changes in accordance with an angular rate;

means for applying an alternating signal which corresponds to the drive voltage applied to the first terminal in accordance with the signal at the second terminal;

frequency multiplier means responsive to a signal which corresponds to the oscillation frequency of the oscillator to produce a clock pulse having a frequency higher than the oscillation frequency;

means for producing a phase difference pulse signal having a duty cycle which changes in accordance with a phase difference between the signal occurring at the third terminal of the oscillator and either the signal applied to the first terminal or the signal occurring at the second terminal;

and counter means for counting the clock pulse during a time interval when the phase difference pulse signal assumes a high or a low level.

5,587,530

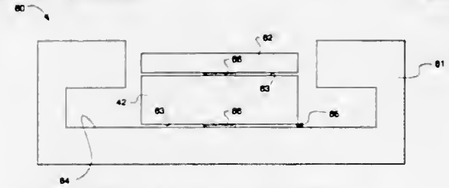
LOW STRESS MAGNET INTERFACE FOR A FORCE REBALANCE ACCELEROMETER

Steven A. Foote, Issaquah, and Damon R. Stoddard, Seattle, both of Wash., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 184,527, Jan. 21, 1994, Pat. No. 5,532,665. This application Apr. 12, 1995, Ser. No. 420,916

Int. Cl.[6] G01P *15/13;15/08*

U.S. Cl. 73—514.23 **3 Claims**



1. A force rebalance accelerometer, comprising:

a proof mass;

a mounting ring;

a pair of flexures for flexibility connecting the proof mass to the mounting ring;

means for returning the proof mass to a null position, said returning means including a permanent magnet having a first and a second opposing bonding surfaces and at least one excitation ring said first bonding surface of said magnet spaced adjacent to said excitation ring; and

means for bonding said first bonding surface of said magnet to said excitation ring, said bonding means only bonding a predetermined portion of said first bonding surface of said magnet thereby forming a pedestal and wherein a gap exists between a remaining portion of said first bonding surface and said excitation ring.

5,587,531

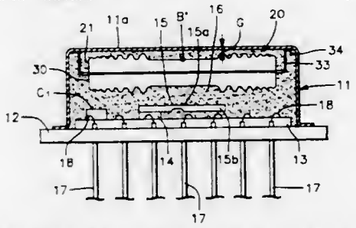
SEMICONDUCTOR STRAIN GAUGE ACCELERATION SENSOR

Takahiro Kawakami; Akira Ogawa, and Etsuo Ichimura, all of Omiya, Japan, assignors to Kansei Corporation, Omiya, Japan

Filed Jul. 11, 1995, Ser. No. 501,174

Int. Cl.[6] G01P *15/12*

U.S. Cl. 73—514.12 **9 Claims**



1. In an acceleration sensor comprising an acceleration detecting semiconductor element for detecting acceleration in a sealed case and a liquid, with which said case is filled, for giving damping to said acceleration detecting semiconductor element, said acceleration sensor further comprising:

a sealed enclosure filled with gas and mounted in said case, said sealed enclosure having deformable diaphragm portions, said diaphragm portions extending in waves outwardly from their centers, a wave height of said diaphragm portions being gradually decreased outwardly;

a change in volume of said liquid caused by a change in temperature of said liquid being absorbed by deformation of said diaphragm portions.

5,587,532

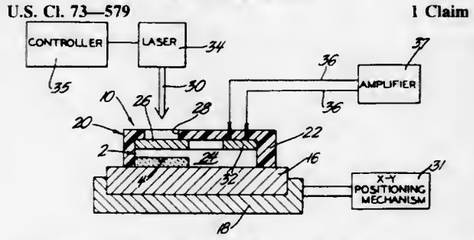
METHOD OF MEASURING CRACK PROPAGATION IN OPAQUE MATERIALS

Douglas N. Rose, Macomb County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1995, Ser. No. 371,719

Int. Cl.[6] G01N *29/04*

U.S. Cl. 73—579 **1 Claim**



1. A method of testing the susceptibility of an opaque ceramic material to failure by spalling comprising the steps of:

making a series of impressions using a pointed indentor at different loads in the surface of the opaque ceramic to be studied to form a sample;

mounting the impressed sample on a base with the surface containing the impressions exposed;

enclosing the sample within a housing and sealing the housing to the base to form a chamber, the housing having a transparent window through which radiation passes;

exposing the surface of the sample with the indentations to a modulated beam of radiation in a predefined pattern about the impressions using different degrees of beam modulation to alternately heat and cool a small defined portion of the exposed surface;

measuring the magnitude of the pressure waves generated by the alternate heating and cooling;

analyzing the difference in the pressure wave magnitude produced by the alternate heating and cooling as a function of the modulation of the radiation beam to determine the depth and size of the subsurface radial cracks formed by the indentor within the opaque ceramic;

whereby the subsurface radial crack formation is disclosed which correlates to the spalling susceptibility of the opaque ceramic.

5,587,533

SURFACE FEATURE MAPPING USING HIGH RESOLUTION C-SCAN ULTRASONOGRAPHY

John K. Schneider, Snyder, N.Y., and William E. Glenn, Ft. Lauderdale, Fla., assignors to Ultra-Scan Corporation, Amherst, N.Y.

Continuation of Ser. No. 33,800, Jan. 13, 1993, abandoned, which is a division of Ser. No. 610,429, Nov. 7, 1990, Pat. No. 5,224,174. This application Jan. 27, 1995, Ser. No. 379,004

Int. Cl.[6] G01N *29/06;* **A61B** *8/00*

U.S. Cl. 73—614 **7 Claims**

1. A method for ultrasonic imaging of human or animal tissue having a surface comprising the steps of:

a. rigidly supporting said surface of human or animal tissue for imaging the same over the area of an image plane;

b. focusing and directing an ultrasonic beam onto said surface and in a direction always substantially perpendicular to said

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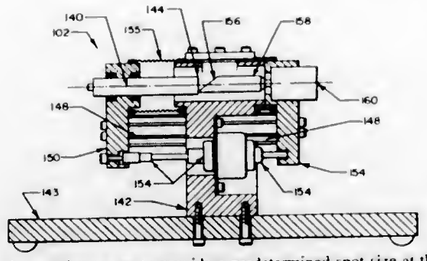


image plane so as to provide a predetermined spot size at the focal point of said beam to provide high lateral resolution imaging in a plane substantially perpendicular to the direction of said beam;

c. performing a C-mode ultrasonic scan over a fixed area of said surface utilizing said ultrasonic beam; and

d. applying range gating to said area at a selected location from the surface to a given depth beneath said surface.

5,587,534

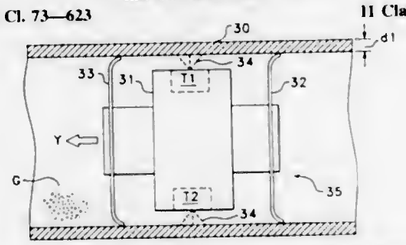
WALL THICKNESS AND FLOW DETECTION APPARATUS AND METHOD FOR GAS PIPELINES

Joseph D. McColskey, Broomfield; William P. Dube, Denver; Christopher M. Fortunko, Boulder; Raymond E. Schramm, Thornton; Martin C. Renken, Boulder, all of Colo.; Cecil M. Teller, II, and Glenn M. Light, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 28, 1994, Ser. No. 330,592

Int. Cl.[6] G01N *29/10*

U.S. Cl. 73—623 **11 Claims**



1. A method for determining a pressure vessel wall thickness and detecting a flaw in the pressure vessel wall comprising the steps of:

generating a high power electrical pulse with a pulser;

transmitting the high power electrical pulse through a diplexer and then simultaneously to an ultrasonic transducer which is located inside the pressure vessel, and to an amplifier;

transmitting an ultrasonic pulse from the ultrasonic transducer through a pressurized gas couplant and then into an inside surface of the pressure vessel;

receiving through the ultrasonic transducer, the diplexer, and the amplifier a return signal from the inside surface of the pressure vessel and calculating the distance d1 from the transducer to the inside surface;

receiving through the ultrasonic transducer, the diplexer, and the amplifier a return signal from an outside surface of the pressure vessel;

calculating a thickness of the pressure vessel wall; detecting a flaw in the pressure vessel wall; choosing said pressure vessel from a group of gas pipelines having a gas pipeline wall and a composition of metal, plastic, and ceramic;

said combination of the amplifier and the diplexer forming a circuit having a large dynamic range, a fast response, and a fast recovery; and

selecting the diplexer to comprise a means for producing a saturation threshold matched to the input voltage limits of the amplifier.

5,587,535

PRESSURE SENSOR INCLUDING A PAIR OF SLIDABLE CONTACTS BETWEEN A STRAIN GAGE AND A PRINT CIRCUIT BOARD

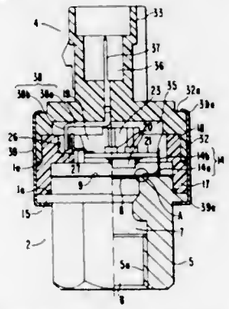
Keiji Sasaki, Zama, and Masayuki Koguchi, Yamato, both of Japan, assignors to Fujikoki Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1995, Ser. No. 423,147

Claims priority, application Japan, Jul. 8, 1994, 6-157160

Int. Cl.[6] G01L *9/04;1/22*

U.S. Cl. 73—726 **8 Claims**



1. A pressure sensor, comprising:

a pressure-sensitive coupler body having, at one end thereof, a diaphragm deflective in a first direction in response to a pressure introduced from a pressure inlet and a strain gage overlying said diaphragm for detecting deflection of said diaphragm;

an intermediate body having at least one support member, said intermediate body being coupled onto said pressure-sensitive coupler body to encircle said strain gage;

a signal-detective coupler body coupled onto said intermediate body in an opposed relation with said pressure-sensitive coupler body to define a closed chamber in said intermediate body, and having at least one external-connective terminal for electrical connection to the exterior of the pressure sensor;

a printed board supported by said at least one support member in said closed chamber of said intermediate body and carrying electronic parts thereon;

a first connector electrically connecting said printed board to said terminal of said signal-detective coupler body; and

a second connector electrically connecting said strain gage and said printed board by slidable contact between at least one pair of slidable contact members which are brought into slidable contact solely from a second direction approximately orthogonal to said first direction;

wherein one of said pair of slidable contact members operatively engages said strain gage.

5,587,536

DIFFERENTIAL PRESSURE SENSING DEVICE FOR PNEUMATIC CYLINDERS

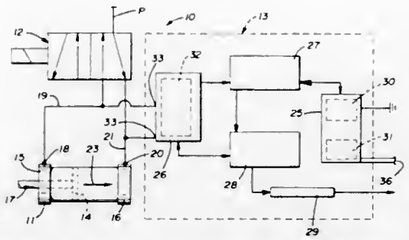
John Rasmussen, 8433 South Ave., Youngstown, Ohio 44514

Filed Aug. 17, 1995, Ser. No. 516,375

Int. Cl.[6] G01L *7/16;* **F01B** *31/12*

U.S. Cl. 73—744 **4 Claims**

1. A pneumatic cylinder control positioning determination system comprising, a pneumatic cylinder having a piston movable therein from a retracted position to an extended position, pressure inlet and outlet ports within said cylinder, pressure lines extend from said ports, a control valve interconnected with said pressure



ports via said pressure lines, a pressure differential sensor switch in communication with said pressure ports between said cylinder and said control valve said pressure differential sensor switch comprising pressure differential sensor, calculating a control output value from the pressure differential between said inlet ports and said outlet ports within said cylinder.

5,587,537

METHOD AND APPARATUS FOR WELD TESTING

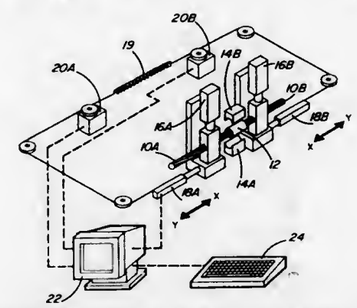
Frederick H. G. Simmons, Fergus, Canada, assignor to Alcatel Canada Wire Inc., North York, Canada

Filed Feb. 24, 1995, Ser. No. 393,694

Claims priority, application Canada, Mar. 15, 1994, 2119061

Int. Cl.[6] G01L *5/04*

U.S. Cl. 73—862.392 **20 Claims**



1. A method for producing an end-to-end weld and determining if the end-to-end weld has a desired level of quality, comprising the steps of: providing elongated objects having ends to be welded, wherein each elongated object is a conductor for an electrical cable; pressing said ends to be welded against one another and maintaining them in such pressed condition; welding said ends to produce the end-to-end weld; thereafter, applying a predetermined tension to the end-to-end weld; measuring elongation produced by the predetermined tension; and comparing said elongation to a preset value, thereby determining whether the end-to-end weld has the desired level of quality.

5,587,538

DOWNHOLE VOLATILE ORGANIC COMPOUNDS TRAP FOR IMPROVED SAMPLING OF VOLATILE ORGANIC COMPOUNDS USING CONE PENETROMETER TESTING TECHNIQUES

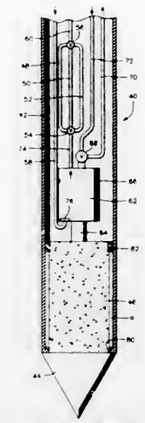
Wes Bratton, South Royalton, Vt., assignor to Applied Research Associates, Inc., Albuquerque, N.M.

Filed Oct. 11, 1995, Ser. No. 540,802

Int. Cl.[6] G01N *1/16*

U.S. Cl. 73—863.33 **20 Claims**

1. A probe for obtaining a plurality of samples of volatile organic compounds at different depths up to 300 feet, said probe comprising:



a hollow housing for penetrating the earth, and

a plurality of volatile organic compound traps fixedly mounted in said housing for accompanying said housing as said housing penetrates the earth, said plurality of traps each having two ends and each end of each of said plurality of traps being connected respectively to two common valves for controlling entry of a volatile organic compound sample into a respective one of said plurality of traps dependent upon a position of said valves at each end of said plurality of traps so that a sample of volatile organic compounds under a vacuum force can be obtained at different depths of penetration of the earth by said housing.

5,587,539

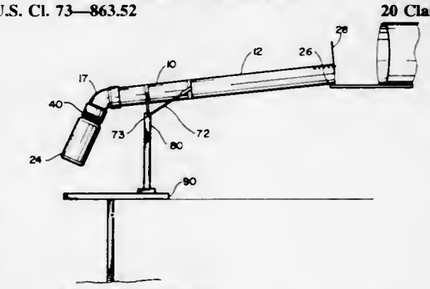
GRAB SAMPLER

John K. Carpenter, 12148 Dunsinane, Bridgeton, Mo. 63044

Filed Jun. 14, 1994, Ser. No. 259,391

Int. Cl.[6] G01N *1/20*

U.S. Cl. 73—863.52 **20 Claims**



1. A grab sampler, comprising:

A substantially elongated tubular member having a first open end and a second open end;

A container defining a cavity for storing a predetermined quantity of liquid, said container having an open end through which said liquid is received, and a closed end, said open end of said container is coupled to said first open end of said elongated tubular member;

A pivot member attached to said elongated tubular member which causes said elongated tubular member to be motionless until said predetermined quantity of liquid is received into said container and which causes said substantially elongated tubular member to pivot in a vertical direction when said container has received a predetermined quantity of said liquid; and

A cap attached to said second open end which permits said liquid to flow into said second open end and which closes said

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second open end once said container has received said predetermined amount of said liquid.

5,587,540

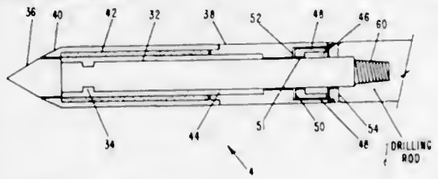
SOIL SAMPLING DEVICE WITH LATCH ASSEMBLY HAVING A VARIABLE CIRCUMFERENTIAL SHAPE

Robert D. Meyer, 13501 Witcher NE., Albuquerque, N.M. 87112

Continuation of Ser. No. 189,957, Feb. 1, 1994, abandoned. This application Jun. 16, 1995, Ser. No. 491,281

Int. Cl.[6] G01N *1/08*

U.S. Cl. 73—864.44 **13 Claims**



1. A soil sampler, comprising:

a housing;

a rod movably mounted with respect to said housing between a first position extending beyond said housing to assist in penetrating the housing into the soil, and a second position where said rod is retracted within said housing to allow a sample to enter said housing upon advancement of said housing into the soil;

an annular groove on said rod; and

latch means having a longitudinal segment disposed generally parallel to said rod, the longitudinal segment having a transverse segment extending from the longitudinal segment, said latch means in said housing adjacent to said rod, said latch means movable between a first latch position with respect to said rod wherein said rod can be moved with respect to said housing from said rod's first position to said rod's second position, and a second latch position of said latch means with respect to said rod, wherein said transverse segment of said latch means being biased radially inward by a biasing means for extending said transverse segment of said latch means into said annular groove for holding said rod stationary with respect to said housing, whereupon a force applied to said rod, when latched in said rod's second position, is transmitted to said housing to advance said housing into the soil to collect the sample;

wherein said transverse segment of said latch means includes a first curved surface facing and surrounding said rod and conforming circumferentially to the shape of said annular groove.

5,587,541

MUSICAL INSTRUMENT STRINGS

Bruce M. McIntosh, Harrogate; Francis S. Smith, Cheltenham, and Noel A. Briscoe, Dursley, all of England, assignors to Zyex Limited, Gloucestershire, United Kingdom

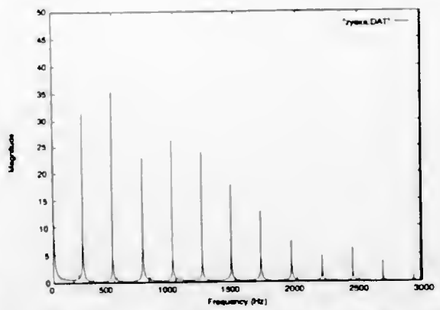
Filed Oct. 10, 1995, Ser. No. 541,597

Claims priority, application Great Britain, Jul. 18, 1995, 9514688

Int. Cl.[6] G10D *3/00*

U.S. Cl. 84—297 S **11 Claims**

1. A string for a musical instrument, said string comprising a thermoplastic aromatic polyetherketone and having a value of E/ρ^2 which is not greater than 5×10^3, where E is Young's modulus of



the string material measured in N/m^2 and ρ is the density of the string material measured in kg/m^3.

5,587,542

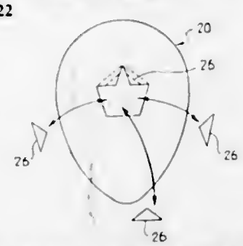
TUNABLE PLECTRUM

Philip Everly, 10414 Camarillo St., North Hollywood, Calif. 91602

Filed Apr. 29, 1996, Ser. No. 638,801

Int. Cl.[6] G10D *3/16*

U.S. Cl. 84—322 **4 Claims**



1. A tunable plectrum comprising a planar material having opposed surfaces, said opposed surfaces having an opening extending therethrough, said opening having a center, the periphery of said opening including a plurality of angularly spaced inwardly projecting finger engaging material points extending into said opening toward said center, the periphery of said opening between said material points forming pointed outwardly extending tuning openings pointing radially away from said center, and means for varying the size, shape, and number of said inwardly projecting material points and the size, shape and number of said outwardly pointing tuning openings both to increase the size of said opening to enable the musician to hold the plectrum with stability and to tune the plectrum.

5,587,543

MUSICAL INSTRUMENT

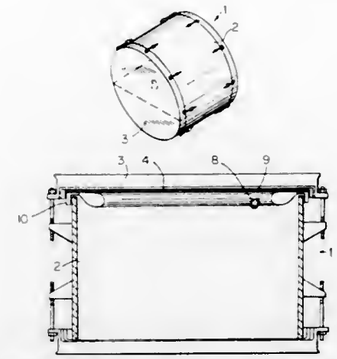
Carlos A. Da Silva Marques, Rua Vitor Brecheret, 520, Apt. 08-B, Osasco, Sao Paulo, Brazil

Filed Aug. 31, 1995, Ser. No. 521,825

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—411 M **13 Claims**

1. A musical instrument, comprising a body; at least one element movable relative to said body and producing sound; and an inflatable cushion arranged so as to be in contact with said element during playing the instrument, said element being formed as a membrane and said body together with said element forming a drum, said inflatable cushion being ring-shaped and arranged in said body so that it extends along a peripheral portion of said membrane, said inflatable cushion having an axial surface abutting



against said membrane, said inflatable cushion having a radially outer ring-shaped projection clamped between said body and said membrane.

5,587,544

DRUM

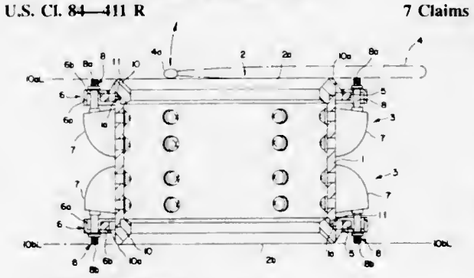
Junji Fujii, and Yukimasa Okumura, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Filed May 17, 1995, Ser. No. 443,581

Claims priority, application Japan, Jun. 22, 1994, 6-139999; Aug. 12, 1994, 6-190427

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—411 R **7 Claims**



1. A drum comprising:

a shell having open ends at both ends;

reinforcement rings provided on edges of said open ends of said shell;

batter heads stretched over outer edges of said reinforcement rings so as to enclose said open ends of said main body; and

a plurality of head supporting and stretching assemblies provided on an outer surface of said shell so as to hold said stretched batter heads at both ends of said shell, any part of each one of said supporting and stretching assemblies being between imaginary planes defined by said outer edges of said reinforcement rings.

5,587,545

MUSICAL TOY WITH SOUND PRODUCING BODY

Takashi Nakada; Keiichi Kazami, both of Saitama, and Kenji Kaneko, Chiba, all of Japan, assignors to Kabushiki Kaisha B-AI, Japan

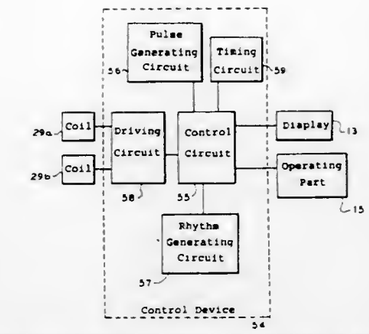
Filed Feb. 16, 1995, Ser. No. 389,351

Claims priority, application Japan, Mar. 10, 1994, 6-067681; Sep. 20, 1994, 6-251366; Nov. 14, 1994, 6-304403

Int. Cl.[6] A63H *3/28;33/26;* **G10D** *13/08;* **G10H** *1/40*

U.S. Cl. 84—600 **8 Claims**

1. A musical toy wherein:



(a) there are provided a toy body, a sound producing body and a control device;

(b) the toy body comprises a first permanent magnet and a swinging body swingably mounted in the vicinity of the first permanent magnet;

(c) the swinging body comprises a tapper for striking the sound producing body and an acting part for magnetically interacting with the first permanent magnet and generating a swinging force;

(d) the acting part comprises a second permanent magnet for swinging the tapper up;

(e) the acting part comprises a coil for swinging down the upswung tapper against the resistance of the second permanent magnet;

(f) the control device comprises rhythm signal generating means for generating a rhythm signal and by supplying this rhythm signal to the coil causes the swinging body to swing according to the rhythm signal; and

(g) the sound producing body is disposed in such a position that it is struck by the tapper of the swinging body when the swinging body swings according to the rhythm signal.

5,587,546

KARAOKE APPARATUS HAVING EXTENDIBLE AND FIXED LIBRARIES OF SONG DATA FILES

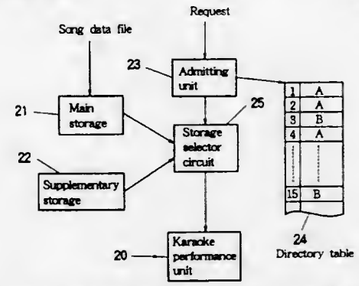
Hirokazu Kato, Hamamatsu, and Hiroshi Mino, Tokyo, both of Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 15, 1994, Ser. No. 339,824

Claims priority, application Japan, Nov. 16, 1993, 5-309768

Int. Cl.[6] G10H *1/26;7/00*

U.S. Cl. 84—609 **4 Claims**



2. A karaoke apparatus for playing a karaoke song designated by a request, comprising:

first storage means for rewritteably storing a plurality of song data files corresponding to a plurality of karaoke songs to form an extendible library which can be updated;

second storage means for permanently storing another plurality of song data files corresponding to another plurality of karaoke songs to form a fixed library which cannot be updated;

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director means having a directory table which records a classification of each song data file to classify each song data file to one of the extendible library and the fixed library;

retrieval means responsive to a request for addressing the directory table to check a classification of a requested song data file, and for retrieving the same selectively from one of the extendible library and the fixed library according to the classification; and

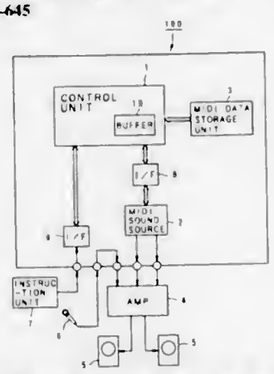
tone generator means for processing the retrieved song data file to sound a desired karaoke song designated by the request.

5,587,547

MUSICAL SOUND PRODUCING DEVICE WITH PITCH CHANGE CIRCUIT FOR CHANGING ONLY PITCH VARIABLE DATA OF PITCH VARIABLE/INVARIABLE DATA

Toshiki Nakai; Mitsuyoshi Amano; Kazuhiro Miyamoto; Yoshiyuki Akiba, and Masuhiro Sato, all of Tokyo-to, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 273,490
Claims priority, application Japan, Jul. 14, 1993, 5-173856
Int. Cl.[6] G09B *15/02*; **G10H** *7/00*
U.S. Cl. 84—645 **7 Claims**



1. A musical sound producing device for producing musical sound from MIDI data, comprising:

a MIDI sound source for producing musical sound from prepared MIDI data including play data for producing musical sound of plurality of tones, pitch data for designating pitch of the tones and pitch variable/invariable data indicating pitch variable tones and pitch invariable tones, said MIDI sound source producing musical sound of tones designated by the play data with pitch designated by the pitch data;

an instruction unit for receiving a pitch change information from a user; and

a pitch change circuit for changing the pitch data of only pitch variable tones specified by the pitch variable/invariable data in accordance with the pitch change information.

5,587,548

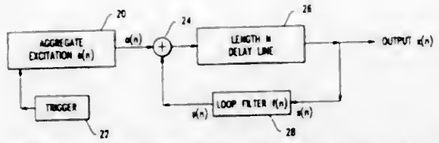
MUSICAL TONE SYNTHESIS SYSTEM HAVING SHORTENED EXCITATION TABLE

Julius O. Smith, III, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Continuation-in-part of Ser. No. 90,783, Jul. 13, 1993, Pat. No. 5,500,486. This application Sep. 1, 1994, Ser. No. 300,497
Int. Cl.[6] G10H *5/02*
U.S. Cl. 84—659 **46 Claims**

1. A tone synthesis system for synthesizing a tone produced by a vibrating element in conjunction with a resonant member to which the vibrating element is acoustically coupled, comprising:

a closed loop including an input for receiving an excitation signal, a delay for delaying a signal circulating in the loop,



and a filter for filtering a signal circulating in the loop and an output from the closed loop for providing a synthesized tone, wherein the amount of delay in the loop corresponds to the pitch of a tone to be synthesized;

excitation means for providing an excitation signal to the input, said excitation signal including components corresponding to a first partial response of said resonant member to an excitation of said vibrating element; and

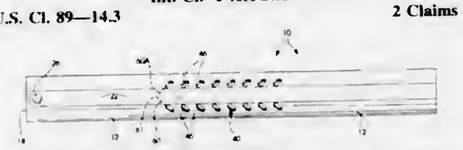
resonant filter means for imparting resonance to said output signal in accordance with a second partial response of said resonant member to the excitation of said vibrating element, wherein said first and second partial responses represent a total response of said resonant member to the excitation of said vibrating element.

5,587,549

ANGULAR PORTING SYSTEM AND SHOTGUN BARREL EQUIPPED THEREWITH

John D. Clouse, Batesville, Ark., assignor to Jana, Inc., Batesville, Ark.

Filed Jul. 3, 1995, Ser. No. 497,771
Int. Cl.[6] F41A *21/36*
U.S. Cl. 89—14.3 **2 Claims**



1. A ported shotgun barrel comprising:

an elongated tubular barrel having a top and a bottom with a longitudinal axis extending substantially from a breech to a muzzle end;

two rows of regularly spaced apart oblong porting orifices defined in said barrel and extending toward said breech from adjacent said muzzle end, said rows radially spaced apart from one another along said top, and wherein each of said oblong porting orifices has an axis forming an acute angle of approximately forty-five degrees with respect to said longitudinal axis, so that forces generated by escaping gases are translated into a downwardly aimed component resisting muzzle jump and a forwardly aimed component resisting recoil;

wherein said axis of each oblong porting orifice in the first of said two rows angularly intersects said axis of the corresponding oblong porting orifice in the second of said two rows to form a hypothetical arrow that points towards said muzzle end; and,

wherein the combined area of each of the porting orifices is approximately seventy percent of the interior cross-sectional area of the shotgun barrel.

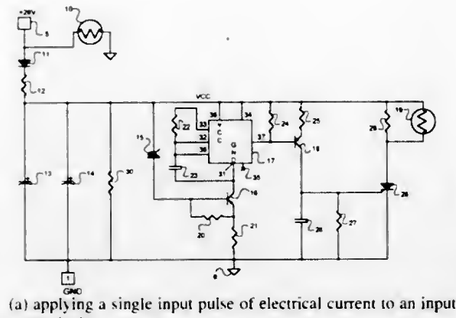
5,587,550

INTERNALLY TIMED, MULTI-OUTPUT IMPULSE CARTRIDGE

Kenneth E. Willis, Redwood City; William D. Fahey, Cupertino, and David S. Whang, San Jose, all of Calif., assignors to Quantic Industries, Inc., San Carlos, Calif.

Filed Mar. 23, 1995, Ser. No. 409,258
Int. Cl.[6] F23Q *7/00*
U.S. Cl. 102—217 **14 Claims**

1. A method for generating sequentially timed, multiple explosive output charges, comprising:



(a) applying a single input pulse of electrical current to an input terminal;

(b) using current from the single input pulse to actuate a first output initiator device and fire a first explosive device;

(c) after the first output initiator device has actuated, using current from the single input pulse to charge a capacitor to a predetermined voltage level;

(d) measuring a delay after the firing of the first output initiator device using a timing circuit responsive to the voltage level; and

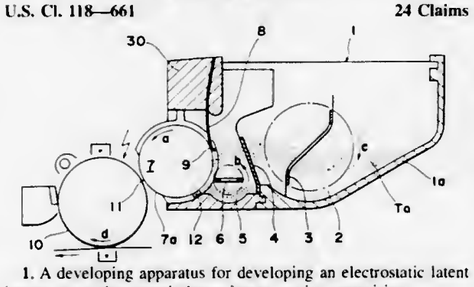
(e) after the end of the delay, discharging the capacitor through a second output initiator device to actuate the second output initiator device and fire a second explosive device.

5,587,551

DEVELOPING APPARATUS

Akihito Ikegawa, Sakai; Kouichi Aritomo, Itami; Kazuki Tsukamoto, Katano, and Michiya Yamashita, Itami, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 233,525, Apr. 26, 1994, abandoned, which is a division of Ser. No. 16,671, Feb. 11, 1993, Pat. No. 5,338,895, which is a continuation of Ser. No. 552,069, Jul. 13, 1990, abandoned. This application Oct. 12, 1995, Ser. No. 542,299
Claims priority, application Japan, Jul. 17, 1989, 1-185266
Int. Cl.[6] G03G *15/00*
U.S. Cl. 118—661 **24 Claims**



1. A developing apparatus for developing an electrostatic latent image on an electrostatic latent image carrier comprising:

a developing member having an outer surface for retaining an electrostatically charged toner thereon and being provided rotatably in a predetermined direction; and

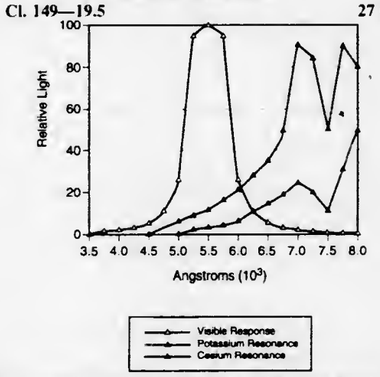
a regulating blade formed by a plate which has a fixedly disposed one end and an opposing free end, said plate being bent in the vicinity of the free end in a direction away from the developing member so as to form a bent portion, said bent portion having a first flat portion extending in a substantially tangential direction with respect to the surface of the developing member, a bent corner extending in a direction away from the developing member, and a second flat portion connected to said first flat portion through said bent corner, said bent corner having a round curvature shape and a curvature radius no greater than 0.5 mm, a length measured from the bent corner to the free end being 0.5 to 5 mm, said bent portion being located upstream of said fixedly disposed one end with reference to the direction of rotation of said developing member.

5,587,552

INFRARED ILLUMINATING COMPOSITION

David R. Dillebay, and David W. Turner, both of Marshall, Tex., assignors to Thiokol Corporation, Ogden, Utah

Filed Nov. 9, 1993, Ser. No. 150,427
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.5 **27 Claims**



1. A composition which emits infrared light upon burning comprising:

an infrared emitting material selected from the group consisting of cesium nitrate, rubidium nitrate, and mixtures thereof, said infrared emitting material being present from about 10% to about 20% by weight;

ammonium nitrate present from about 45% to about 65% by weight; and

a fuel.

5,587,553

HIGH PERFORMANCE PRESSABLE EXPLOSIVE COMPOSITIONS

Paul C. Braithwaite, Brigham City, Utah; Gary K. Lund, Malad, Id., and Robert B. Wardle, Logan, Utah, assignors to Thiokol Corporation, Odgen, Utah

Filed Nov. 7, 1994, Ser. No. 335,097
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.6 **20 Claims**

9. A high solids pressable explosive composition comprising:

a chain-extended PGN (polyglycidyl nitrate) having a weight average molecular weight greater than 10,000 determined using a polystyrene standard; and

a high explosive having a concentration in the pressable explosive composition in the range from about 92 weight percent to about 96 weight percent.

5,587,554

CABLE DIRECTING DEVICE

Ralph C. Kendrick, Jr., 553 Warren Ave., Chesapeake, Va. 23320

Filed Feb. 22, 1993, Ser. No. 20,568
Int. Cl.[6] H02G *9/00*
U.S. Cl. 174—37 **11 Claims**

1. A cable directing device for enclosing and directing underground electrical cable between an underground shielding conduit

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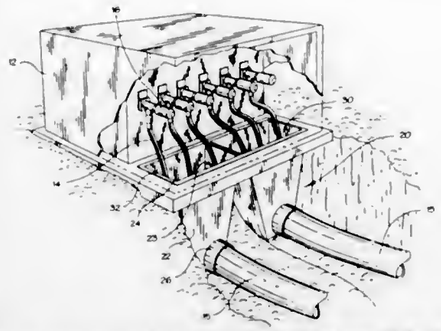


for the cables and an above-ground electrical apparatus of the type disposed on a preformed supporting pad having formed therein an access opening substantially enlarged in relation to the underground conduit for passage of the cables through access opening, said directing device comprising a hollow housing defining first and second cable passage openings and a cable directing passageway extending interiorly through the housing between said first and second cable passage openings, said first cable passage opening being directed upwardly and being substantially larger than said second cable passage opening, said first cable passage opening being configured to substantially conform to and be matable with the access opening in the supporting pad and said second cable passage opening being directed generally horizontally and configured to substantially conform to and be matable with the underground shielding conduit, including a mating member projecting outwardly from said housing and configured to mate with an underground shielding conduit, said first and second cable passage openings being oriented substantially perpendicularly to one another and said cable directing passageway being curved substantially ninety degrees (90°) between said first and second cable passage openings and being tapered narrowingly from said first cable passage opening toward said second cable passage opening, said cable directing device including means for mounting said device to the supporting pad whereby said cable directing device may be positioned to project downwardly from the access opening in the supporting pad for directing a plurality of underground cables between the access opening in the supporting pad and the underground conduit.

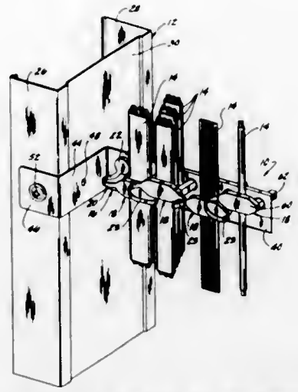
5,587,555
CONDUCTOR HOLDING DEVICE
Eric R. Rinderer, Highland, Ill., assignor to B-Line Systems, Inc., Highland, Ill.
Filed Jun. 3, 1994, Ser. No. 253,507
Int. Cl.[6] H02G *3/10*
U.S. Cl. 174—49 **21 Claims**

1. A device adapted to be mounted on a support member for holding a conductor in a substantially fixed position extending generally parallel to the support member, said device comprising

a bracket having an arm with at least one opening therein, said bracket being adapted to be mounted on said support member so that the arm extends laterally from the member at one side of the member,

a clamp having a head and at least one leg projecting from the head adapted for reception in said opening in the arm, the leg of the clamp being movable in the opening in a first axial direction with respect to the leg so that the head of the clamp can be pushed closer to the arm to move the clamp to a clamping position in which the head of the clamp is in clamping engagement with the conductor disposed between the head and the arm and extending generally parallel to the support member, and

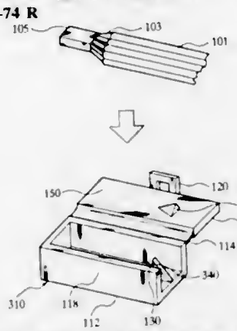
retainer means for retaining the clamp in said clamping position, said retainer means comprising a structure on the arm adjacent the opening in the arm for biting into the leg of the clamp



when the clamp is pushed to its said clamping position thereby to lock the clamp in its said clamping position by inhibiting any movement of the head of the clamp away from the arm after the clamp has been moved to said clamping position,

said leg being formed so that said structure can bite into the leg at any location along at least a major portion of the length of the leg, thereby enabling the clamp to tightly clamp any conductor having any thickness within a wide range of thicknesses.

5,587,556
PROTECTIVE CASING FOR END CONNECTING PART OF WIRE
Takatatsu Yamamoto; Shigehiko Kobayashi, and Tomohiro Ikeda, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 16, 1994, Ser. No. 357,312
Claims priority, application Japan, Dec. 20, 1993, 5-320347
Int. Cl.[6] H01R *4/22*
U.S. Cl. 174—74 R **15 Claims**



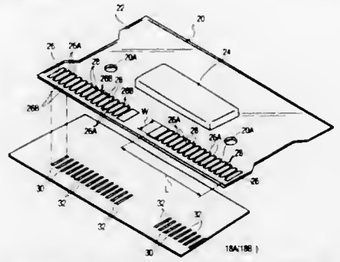
1. A protective casing for accommodating an end connecting part of a bundle of wires, comprising:

a casing body forming a storage chamber therein to accommodate the end connecting part, said casing body having an opened upper portion and an opened side portion on at least one side thereof in the longitudinal direction; and

a lid pivotably connected to said casing body to close said upper portion, said lid having a presser piece formed on an inner surface of said lid to press against the end connecting part when said lid is closed against said casing body;

wherein said casing body has a stop member which projects inwardly from a bottom wall of said casing body and which separates the wires when the wires are accommodated in the protective casing.

5,587,557
PRINTED CIRCUIT BOARD AND LIQUID CRYSTAL DISPLAY
Mikio Kurihara, Yokohama; Satoru Nishi, Zama; Takahiro Onodera, Sagamihara, and Kazunari Kushima, Shiga-ken, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 29, 1994, Ser. No. 314,992
Claims priority, application Japan, Sep. 29, 1993, 5-242879
Int. Cl.[6] H05K *1/02*
U.S. Cl. 174—266 **2 Claims**



1. An improved Tape Automated Bonding (TAB) structure for contacting a printed circuit board, said TAB structure comprising:

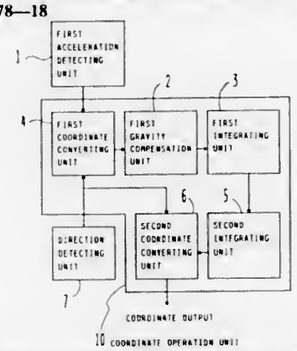
a film base in which an opening is provided;

wiring which is printed on said film base and extending near said opening; and

long, narrow electrodes which are connected with said wiring and formed so as to traverse said opening in said film base,

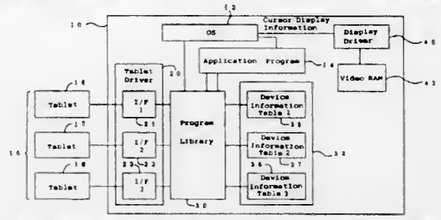
wherein said opening in said film base on either sides of said long, narrow electrodes is wider than at said long, narrow electrodes.

5,587,558
COORDINATE DETECTING APPARATUS HAVING ACCELERATION DETECTORS
Kenichi Matsushima, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Jan. 21, 1993, Ser. No. 7,072
Claims priority, application Japan, Jan. 24, 1992, 4-010627; May 26, 1992, 4-133921; Aug. 26, 1992, 4-227643
Int. Cl.[6] G08C *21/00;* **G09G** *3/02*
U.S. Cl. 178—18 **28 Claims**



1. A coordinate input device for obtaining the spatial coordinates at the tip of a pen-type coordinate indicator, comprising: acceleration detecting means for detecting the acceleration of a body of the pen-type coordinate indicator; attitude detecting means for detecting the attitude of the body of the pen-type coordinate indicator; and coordinate operation means for determining the spatial coordinates at the tip of the coordinate indicator in accordance with outputs of the acceleration detecting means and the attitude detecting means.

5,587,559
CONTROL METHOD OF A PLURALITY OF LOCATORS AND CONTROL DEVICE OF SAME
David C. Fleck, Vancouver, Wash., and Yoichi Tsuchida, Saitama, Japan, assignors to Wacom Co., Ltd., Saitama, Japan
Filed Dec. 1, 1994, Ser. No. 352,133
Claims priority, application Japan, Nov. 18, 1994, 6-309757
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—18 **10 Claims**



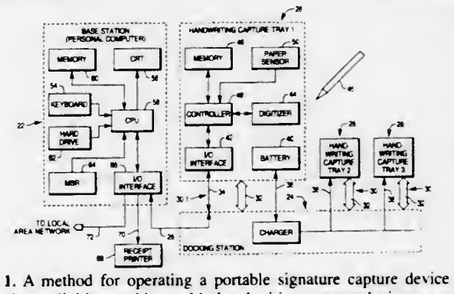
10. A tablet interfacing device for converting coordinate information and switching information from plural tablets each of which has at least one of pointing device into any suitable forms adapted for an operating system, and supplying the converted information to this operating system, the device comprising:

a conversion-table forming means for forming a conversion-table which is converted whenever the switch information from each of the whole switches assembled on the plural tablets is associated with a mouse event or keyboard input;

a decision means for deciding whether the switch information on each one of the whole switches of the plural tablets is ON or OFF; and

a transmit means for transmitting sequentially the coordinate data from each one of the plural tablets to the operating system in a time sharing manner when all of the switch information are OFF, or the converted information through the conversion-table as the information from the mouse event or the keyboard input to the operating system when any one of the switch information is ON.

5,587,560
PORTABLE HANDWRITTEN DATA CAPTURE DEVICE AND METHOD OF USING
John F. Crooks, Duluth, and Robert L. Protheroe, Lawrenceville, both of Ga., assignors to AT&T Global Information Solutions Company, Dayton, Ohio
Filed Apr. 10, 1995, Ser. No. 419,657
Int. Cl.[6] G08C *21/00;* **G09G** *3/02;* **G06F** *17/60;* **G06K** *5/00*
U.S. Cl. 178—18 **8 Claims**



1. A method for operating a portable signature capture device having a digitizer, said portable handwriting capture device operating in association with a computer and a docking station, comprising the following steps:

(a) determining whether the computer is transmitting a command to the portable signature capture device;

(b) if step (a) is true, determining whether the command is a command to transmit data;

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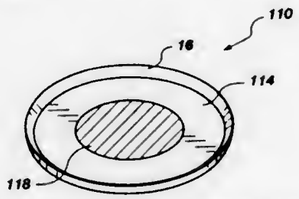
(c) if step (b) is true, transmitting data to the computer;
(d) if step (a) is not true, determining whether a coordinate is available from the digitizer to obtain data from the digitizer;
(e) if step (d) is true, determining whether a pen is in contact with the digitizer;
(f) if step (e) is true, determining whether a paper slip is located over the digitizer; and
(g) if step (f) is true, storing the coordinate and repeating the process for obtaining another coordinate.

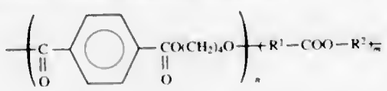
5,587,561
STETHOSCOPE SHIELD
Mahdi Budayr, 611 W. Park St., Urbana, Ill. 61801, and Jack Kolff, 1086 Franklin St., Johnstown, Pa. 15905
Filed Jul. 28, 1995, Ser. No. 508,575
Int. Cl.[6] A61B *7/02*
U.S. Cl. 181—131 **14 Claims**



1. A shield for preventing contact between a diaphragm of a head of a stethoscope and skin of a patient, the shield comprising:
a generally planar piece of material having a surface area larger than the diaphragm of the stethoscope;
an annular flange disposed so as to extend generally upwardly from the planar piece of material, towards the head of the stethoscope so as to shield the head of the stethoscope from body fluids disposed on a patient's skin; and
adhesive attachment means applied to the surface of the planar piece of material for removable attachment to the stethoscope at the diaphragm so as to cover the diaphragm of the stethoscope and prevent contact with the skin of a patient.

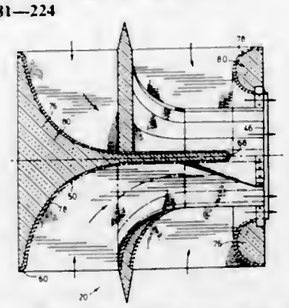
5,587,562
DIAPHRAGM FOR ELECTRO-DYNAMIC TYPE LOUDSPEAKERS
Masatoshi Sato, Tendo, Japan, assignor to Tohoku Pioneer Electronic Corporation, Yamagata-ken, and Pioneer Electronic Corporation, Tokyo, both of Japan
Filed Jul. 18, 1995, Ser. No. 503,632
Claims priority, application Japan, Jul. 26, 1994, 6-174512
Int. Cl.[6] H04R *7/00*
U.S. Cl. 181—167 **1 Claim**

1. A diaphragm used for a loudspeaker comprising polybutylene-terephthalate-polyester-elastomer represented by a formula below:



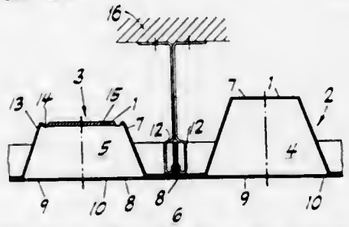
wherein R^1 is selected from the group consisting of $C_{17}H_{34}$, $C_{17}H_{32}$, $C_{17}H_{31}OCOCH_3$, and $Cl_5C_{17}H_{29}$, R^2 is selected from the group consisting of C_4H_8, $CH_2OCH_4H_6$, and CH_2, and n and m individually are integers.

5,587,563
AIR HANDLING STRUCTURE FOR PAN INLET AND OUTLET
Muammer Yazici, and Werner Richarz, both of Ontario, Canada, assignors to Dipti Kr. Datta, Mississauga, Canada
Division of Ser. No. 72,590, Jun. 4, 1993, Pat. No. 5,426,268.
This application Jun. 16, 1994, Ser. No. 260,753
Int. Cl.[6] E04F *17/04*
U.S. Cl. 181—224 **19 Claims**



1. A sound attenuating duct unit suitable for placement at an outlet of an air supply fan unit for a building or other large structure, said duct unit comprising a housing having side walls surrounding a main airflow passageway, a circular air inlet for said passageway at one end of said housing for arrangement next to an outlet of said fan unit, at least one resonator chamber located at said air inlet adjacent said main airflow passageway, and a rectangular air outlet for said passageway at an end of the housing opposite said one end, said housing including internal walls providing a gradual transition in the transverse cross-section of said main airflow passageway from circular to rectangular, wherein said side walls contain sound absorbing material which surrounds said airflow passageway and said at least one resonator chamber is enclosed by chamber walls rigidly mounted in said housing.

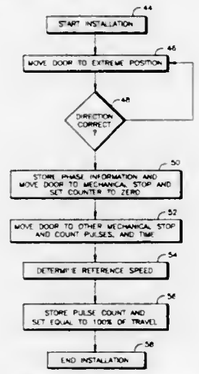
5,587,564
NOISE DAMPER
Reinhard Stief, Weinheim, and Gerhard Müller-Broll, Rimbach, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany
Filed Apr. 10, 1995, Ser. No. 419,687
Claims priority, application Germany, Apr. 27, 1994, 44 14 566.7
Int. Cl.[6] E04B *1/82*
U.S. Cl. 181—295 **17 Claims**



1. A noise damper comprising a molded part of polymer material having at least two chambers and an orifice plate covering the molded part on a side of the molded part facing a sound source,
wherein the chambers are designed as resonators with at least two of the chambers having resonant frequencies that differ from one another;
wherein the molded part is comprised of a closed-cell material;
wherein the chambers are formed as essentially cup-shaped protrusions that open toward the sound source;
wherein the orifice plate comprises at least two openings leading into each chamber;

wherein said molded part and said orifice plate are detachably joined together; and
wherein the number and/or shape of the openings in the orifice plate leading into the chambers differs for at least two of the chambers.

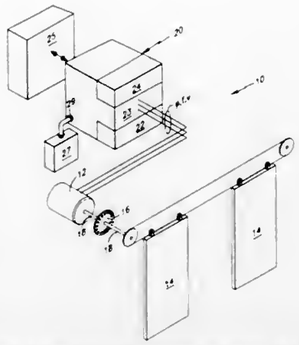
5,587,565
METHOD FOR CONTROLLING ELEVATOR DOORS
Helmut Schröder-Bramloop, and Rüdiger Löb, both of Berlin, Germany, assignors to Otis Elevator Company, Farmington, Conn.
Filed Apr. 14, 1994, Ser. No. 227,435
Int. Cl.[6] B66B *13/14*
U.S. Cl. 187—316 **3 Claims**



1. A method of controlling an elevator door, said method comprising the steps of:
moving an elevator door from one extreme position to the other extreme position;
storing the phase/direction information resulting from said moving step in a memory associated with a microprocessor;
moving said elevator door from one extreme position to the other extreme position at a constant preselected speed while counting pulses generated by an incremental encoder and simultaneously measuring the elapsed time between said extreme positions such that a reference speed is determined; and
normalizing said number of pulses counted to represent 100% of the distance travelled by said elevator door between said extreme positions.

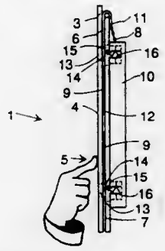
5,587,566
METHOD FOR ADJUSTING AN ELEVATOR DOOR
Michael Barten, and Mustapha Toutaoui, both of Berlin, Germany, assignors to Otis Elevator Company, Farmington, Conn.
Filed Apr. 29, 1994, Ser. No. 236,595
Int. Cl.[6] B66B *13/00;3/00*
U.S. Cl. 187—316 **16 Claims**

1. A method for adjusting an elevator door, comprising the steps of:
providing a service task prompt having a service task list of elevator door adjustment service tasks performed by an elevator door adjustment service program in an elevator door controller;
selecting an elevator door adjustment service task from the service task list;
inputting an elevator door adjustment parameter corresponding to said elevator door adjustment service task;



storing said elevator door adjustment parameter in a memory of said elevator door controller; and
controlling said elevator door in accordance with said elevator door adjustment parameter by adapting the phase, voltage, and torque of an elevator door motor with said elevator door controller.

5,587,567
PUSH BUTTON PANEL FOR AN ELEVATOR
Ari Winter, Hyvinkää, and Johannes de Jong, Järvenpää, both of Finland, assignors to Kone Oy, Helsinki, Finland
Filed Jul. 12, 1994, Ser. No. 273,901
Claims priority, application Finland, Jul. 26, 1993, 933340
Int. Cl.[6] B66B *1/34;* **H01H** *1/00*
U.S. Cl. 187—395 **13 Claims**



1. A push button panel comprising:
a substantially rigid front plate having a front surface and a rear surface, said front surface including at least one push button area located thereon;
a back plate located proximate to said rear surface of said front plate, said back plate including a first aperture;
a pressure sensitive film located between said front plate and said back plate and abutting said front plate and said back plate, said pressure sensitive film including a second aperture;
at least one signal conductor associated with said pressure sensitive film for conducting a signal produced by said pressure sensitive film; and
indicator means aligned with said first aperture and said second aperture for indicating when mechanical work has been applied to the push button area, said indicator means being visible through said first aperture, said second aperture, and a portion of said front plate;
whereby mechanical work applied to the push button area is transferred to the pressure sensitive film to produce said signal in said signal conductor.

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5,587,568

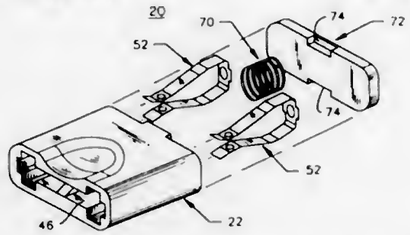
INTERLOCK SWITCH

Thomas J. Lothamer; Carl A. Pontecorvo; Thomas L. Schattke, and Richard A. Osterhout, all of Fort Wayne, Ind., assignors to ITT Corporation, New York, N.Y.

Filed May 19, 1995, Ser. No. 445,085

Int. Cl.[6] H01H *1/38;13/06;* **H01R** *33/06*

U.S. Cl. 200—16 R **21 Claims**



1. An interlock switch for use on a circuit card assembly having oppositely facing surfaces, each of said surfaces having a contact pattern defining circuit and switch functions, comprising:

contact means for engaging said contact patterns to electrically couple said circuits on said oppositely facing surfaces of said circuit card assembly;

switch body means for housing said contact means, said switch body means including slot means for solder-free coupling said switch to an edge of the circuit card assembly, said slot means enabling said switch to selectively reciprocate among a first switch position, a second switch position, and a third switch position, on the edge of the circuit card assembly to electrically couple and uncouple said circuits on said oppositely facing surfaces of said circuit card assembly in any one of said switch positions by connecting said contact patterns on said oppositely facing surfaces of said circuit card assembly with said contact means;

spring means housed within said switch body means for biasing said switch from said third switch position; and

locking projection means for preventing said switch from being easily removed from the edge of the circuit card assembly

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5,587,569

SAFETY SWITCH ASSEMBLIES

Mehdi Mohtasham, Wigan, United Kingdom, assignor to E. J. A. Engineering PLC, Wigan, United Kingdom

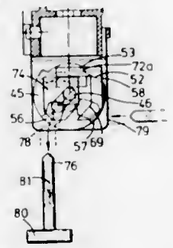
PCT No. PCT/GB93/01135, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO93/24947, PCT Pub. Date Dec. 9, 1993

PCT Filed May 28, 1993, Ser. No. 256,262

Claims priority, application United Kingdom, Jun. 2, 1992, 9211603; Nov. 12, 1992, 9223751

Int. Cl.[6] H01H *3/16*

U.S. Cl. 200—17 R **16 Claims**



1. A safety switch, comprising:

a housing containing electrical contacts movable between a power supply off position and a power supply on position by rotation of an actuating cam also contained within the housing and rotatable about a predetermined axis by an actuator of a predetermined shape insertable into the housing,

at least one locking member mounted for movement in a direction substantially perpendicular to the axis of rotation of the actuating cam, the at least one locking member being resiliently urged towards a position in which the at least one locking member locks the actuating cam against rotation and consequent movement of the electrical contacts to the power supply on position,

the housing defining first and second apertures through which the actuator is insertable, the actuator when inserted into each of the apertures engages the at least one locking member and displaces the at least one locking member away from a path of movement of the actuator into a position in which the actuating cam is free to rotate relative to the housing, and engages and rotates the cam to cause movement of the electrical contacts to the power supply on position,

the at least one locking member comprising first and second slidably interengaged components, the first and second components defining interengaging surfaces configured such that displacement of the first component in a first direction causes the second component to be displaced in a second direction and displacement of the second component in the second direction causes the first component to be displaced in the first direction,

the actuator being configured such that when inserted through the first aperture the actuator pushes the first component in the first direction and when inserted through the second aperture the actuator pushes the second component in the second direction.

5,587,570

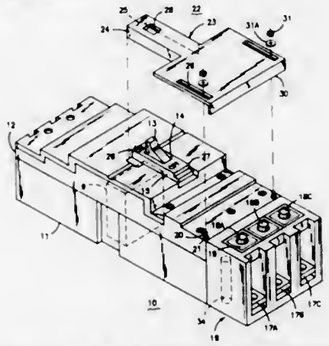
CIRCUIT BREAKER INTERLOCK UNIT TO PREVENT SINGLE PHASING

Joseph B. Kelaita, Jr., Bristol, and Edwin J. Collin, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jul. 11, 1994, Ser. No. 272,480

Int. Cl.[6] H01H *9/20*

U.S. Cl. 200—50.01 **2 Claims**



1. A molded case circuit breaker handle interlock arrangement comprising:

a molded plastic case **10** and cover **12**;

operating means **9** within said case for moving a pair of contacts to an open condition to interrupt circuit current upon the occurrence of an overcurrent condition within a protected electric circuit;

an indicator **18** extending through said cover and moving to an extended position providing indication of said overcurrent occurrence;

an operating handle **13** extending through said cover providing manual access for controlling said operating means and returning said contacts to a closed condition; and

interlock means **22** interacting between said operating handle and said indicator for preventing said contacts from moving to said closed condition until said indicator is returned from said extended position.

5,587,571

COMBINED-ACTION PUFFER CIRCUIT-BREAKER

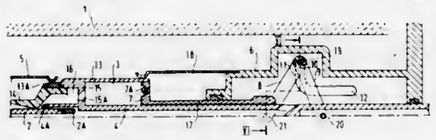
Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alstom T & D SA, Paris, France

Filed Jan. 20, 1995, Ser. No. 375,983

Claims priority, application France, Jan. 25, 1994, 94 00764

Int. Cl.[6] H01H *33/82*

U.S. Cl. 218—60 **4 Claims**



1. A circuit-breaker comprising,

a casing filled with a dielectric gas;

a first arcing contact disposed within said casing connected to a first terminal;

a second arcing contact disposed within said casing having the same longitudinal axis as the first contact, said second arcing contact being a moving arcing contact, said moving arcing contact being connected to a second terminal and being mounted to moving axially in a fixed cylinder, said moving arcing contact cooperating with one and only one piston, said one and only one piston being a moving piston to form a compression chamber;

drive means for driving the moving piston in a first direction opposite to a second direction in which the moving arcing contact is displaced, wherein the drive means acts during a first portion of a displacement of the moving arcing contact from a closed position to an open position; and

means for constraining the moving piston to move with the moving arcing contact during a second portion of the displacement of the moving contact.

5,587,572

BATCH COUNTER

John Kirby, South Devon, England, assignor to Kirby Devon Limited, England

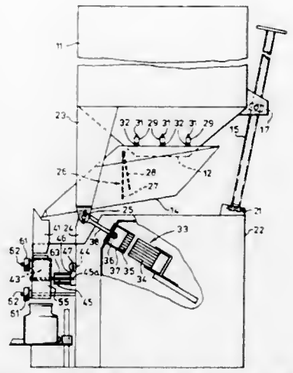
Continuation-in-part of Ser. No. 220,639, Mar. 31, 1994, abandoned. This application Jan. 30, 1995, Ser. No. 380,833

Claims priority, application United Kingdom, Apr. 23, 1993, 9308506; Oct. 6, 1994, 9420173

Int. Cl.[6] B61L *1/16*

U.S. Cl. 235—98 R **20 Claims**

1. A batch counter for tablets and tablet-like items comprising a hopper with a wide bottom opening for passage of a supply of the items to be counted, a counter device for counting the passage of the items from the hopper, and channel means for channeling the items from the hopper to the counter device so as to pass in single file and spaced apart at the counter device, the channel means comprising a lightweight, vibratory, V-section guide channel resiliently suspended, downwardly inclined towards the counter device, beneath the bottom opening of the hopper and adjusted at critical



inclination for flow of the items, and a damming plate swingably suspended above the guide channel.

5,587,573

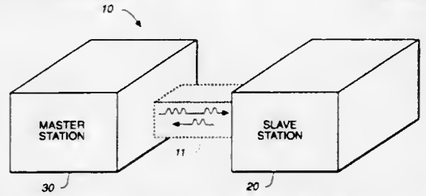
WIRELESS POWERING AND COMMUNICATION SYSTEM FOR COMMUNICATING DATA BETWEEN A HOST SYSTEM AND A STAND-ALONE DEVICE

William H. Owen, Los Altos Hills, and James M. Jaffe, Santa Clara, both of Calif., assignors to Xicor, Inc., Milpitas, Calif.

Continuation of Ser. No. 974,131, Nov. 10, 1992, Pat. No. 5,434,396. This application May 2, 1995, Ser. No. 432,628

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—380 **10 Claims**



1. A slave station formed on the substrate of an integrated-circuit chip for communicating with a master station which is coupled to said slave station by an electromagnetic coupling medium, the electromagnetic coupling medium being capable of communicating data bi-directionally between the master station and said slave station in the form of electromagnetic energy transitions, said energy transitions being coupled through said medium in the form of energy pulses, said slave station comprising:

an inductor means magnetically coupled to the coupling medium and including a segment of conductive material disposed on said substrate, a first terminal and a second terminal coupled at respective ends of said segment of conductive material, said inductor means for receiving magnetic energy transitions from the medium and for providing at said terminals an electrical signal indicative of said transitions;

means coupled to said inductor means for powering said slave station from the energy pulses coupled to said inductor means by said master station through said electromagnetic coupling medium; and

a communication means for selectively emitting at least one energy transition into said electromagnetic coupling medium in a selected time interval.

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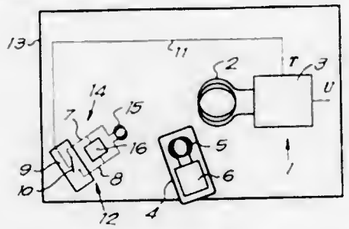
5,587,574

NON-CONTACT READER

Edward Van Geel, G. Hubertistraat 22, 1030 Schaarbeek, Belgium

Continuation of Ser. No. 269,529, Jul. 1, 1994, abandoned.
This application May 15, 1996, Ser. No. 648,292
Claims priority, application Belgium, Jul. 1, 1993, 09300679
Int. Cl.[6] G06K *5/00*
U.S. Cl. 235—380 12 Claims



1. A non-contact reader, comprising:

a reading device arranged to read information from a normal information medium without mechanical or galvanic contact and, in response, generate a meaningful signal, when the information medium is brought into proximity with the reading device;

a test device arranged to test correct operation of the reader, said test device including a test information medium which is a medium of the same type as the normal information medium; and

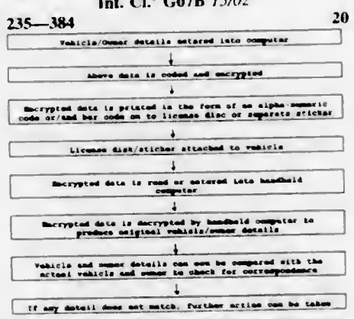
means for permanently mounting the test information medium within range of the reading device so that the test information medium can be read by the reading device in the same way as said normal information medium is read by the reading device to enable the reading device to be tested at any moment or even continually.

5,587,575

IDENTIFICATION OF VEHICLES INCLUDING CODE COMPARISON

Johann R. Leitner, and Anthony Farah, both of Gauteng, South Africa, assignors to Spescom (Proprietary) Limited, Gauteng, South Africa

Filed Aug. 8, 1995, Ser. No. 512,655
Claims priority, application South Africa, Aug. 11, 1994, 94/6046; Dec. 15, 1994, 94/10029
Int. Cl.[6] G07B *15/02*
U.S. Cl. 235—384 20 Claims



1. A method of identifying a vehicle to verify that a driver is authorized to use the vehicle, the method including the steps of

visibly mounting a humanly discernible code on the vehicle; said code including encrypted data relating to features of said vehicle and encrypted data relating to an identifying means of at least one of the vehicle itself, an owner of the vehicle and an authorized user of the vehicle;

reading said code mounted on the vehicle;

decrypting the code to extract therefrom said data relating to said features of the vehicle and to said identifying means;

comparing said data decrypted from said code with said features of said vehicle to determine whether or not said code applies to said vehicle to which it is attached; and

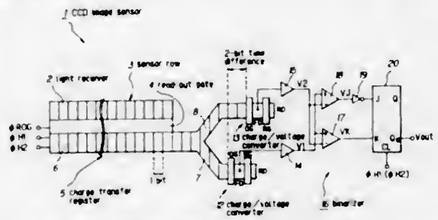
comparing information supplied by a driver of said vehicle with said data decrypted from the code relating to said identifying means to verify that the driver is authorized to use the vehicle.

5,587,576

SOLID-STATE IMAGE-SENSING DEVICE AND BAR CODE READER OPERABLE WITH LOW VOLTAGE POWER SUPPLIES AND USING TWO CHARGE TRANSFER DEVICES OF DIFFERENT SIZES

Yasuhito Maki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 25, 1995, Ser. No. 451,060
Claims priority, application Japan, May 27, 1994, 6-138151
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—462 14 Claims



1. A solid-state image-sensing device comprising:

a sensor having a plurality of light-receiving portions arrayed, each light-receiving portion converting incident light into a signal charge corresponding to the amount of incident light and accumulating the signal charges;

a charge transfer part for distributing between at least two systems the signal charge stored at one light-receiving portion part of the sensor and transferring the signal charge using different numbers of stages;

a plurality of charge/voltage converters for detecting and converting into voltages the signal charges of the at least two systems transferred by the charge transfer part;

a comparator for carrying out a level conversion on each of the outputs of the plurality of charge/voltage converters; and

a detector for detecting the level transition point of the comparator output signal and generating a binary signal.

5,587,577

MODULAR SCANNER WITH HAND-HELD DATA TERMINAL

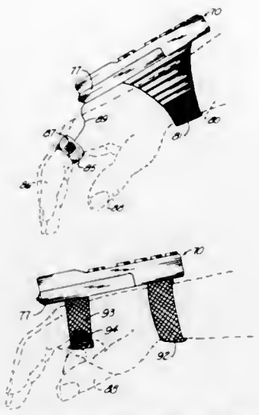
Darald R. Schultz, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 195,154, Feb. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 872,717, Apr. 23, 1992, Pat. No. 5,305,181, which is a continuation-in-part of Ser. No. 364,902, Jun. 8, 1989, abandoned, and Ser. No. 816,705, Jan. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 812,767, Dec. 23, 1991, abandoned. This application May 24, 1995, Ser. No. 449,630
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—472 102 Claims

1. A body-mounted data acquisition system, comprising:

(a) a user interface unit for communication with a user;

(b) an optical indica reader module, operational for communication with said user interface unit, for reading optical indicia located externally of said optical indicia reader module and having a port for receiving light reflected from the optical indicia;



(c) user interface unit mounting means for securing said user interface unit to the user's body near a wrist and over a forearm of the user; and

(d) optical indicia reader module mounting means for securing said optical indicia reader module in a position over a top side of a hand of the user, the top side being the side opposite a palm side of the hand, so that the port of said optical indicia reader module is directed over the user's fingers and toward the optical indicia to be read;

said user interface unit being capable of communication with a variety of different said optical indicia reader modules so that one said optical indicia reader module can be replaced with a different said optical indicia reader module thereby permitting customization of the body-mounted data acquisition system.

52. A body-mounted data acquisition system, comprising:

(a) a user interface unit for communication with a user;

(b) an optical indicia reader module, operational for communication with said user interface unit, for reading optical indicia located externally of said optical indicia reader module and having a port for receiving light reflected from the optical indicia;

(c) a user interface unit mounting device for securing said user interface unit to the user's body near a wrist and over a forearm of the user; and

(d) an optical indicia reader module mounting device for securing said optical indicia reader module to said user interface unit in a position over a top side of a hand of the user, the top side being the side opposite a palm side of the hand, so that the port of said optical indicia reader module is directed over the user's fingers and toward the optical indicia to be read; the port of said optical indicia reader module being positioned nearer a hand of the user, and said user interface unit being positioned farther from the hand of the user and between the port and an elbow of the user, when the body-mounted data acquisition system is attached to the user's body for data acquisition.

5,587,578

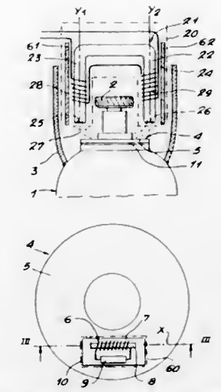
METHOD AND APPARATUS FOR OPTIMIZING MAGNETIC FLUX THROUGH AN ELECTRONIC LABEL OF A CONTACT-FREE IDENTIFICATION SYSTEM

Didier Serra, Marseille, France, assignor to Gemplus, Gemenos, France

Filed Aug. 9, 1995, Ser. No. 512,945
Claims priority, application France, Aug. 10, 1994, 94 10027
Int. Cl.[6] G06K *19/06*
U.S. Cl. 235—492 20 Claims

1. An electronic label for an object identification system, the electronic label comprising

an electronic module coupled with an antenna for the reception and transmission of electromagnetic waves, said antenna comprising a coil having an axis and being wound about a ferrite rod that is elongated in the direction of said axis, and



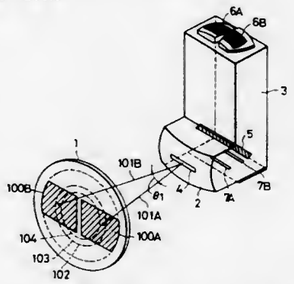
a first foil made of a material that conducts magnetic fields and has a low coercive field, said antenna extending to the direct vicinity of said first foil, and said axis of said coil being parallel to said first foil.

5,587,579

AUTO FOCUS CAMERA AND METHOD OF AUTO FOCUS CONTROL

Yosuke Kusaka, and Ken Utagawa, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 375,010, Jan. 18, 1995, which is a continuation of Ser. No. 261,872, Jun. 17, 1994, abandoned, which is a continuation of Ser. No. 150,289, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 26,199, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 912,720, Jul. 13, 1992, abandoned, which is a division of Ser. No. 795,262, Nov. 19, 1991, Pat. No. 5,191,201, which is a continuation of Ser. No. 540,324, Jun. 19, 1990, abandoned, which is a division of Ser. No. 506,553, Apr. 9, 1990, Pat. No. 4,977,311, which is a continuation of Ser. No. 418,899, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 262,151, Oct. 12, 1988, abandoned, which is a continuation of Ser. No. 77,290, Jul. 24, 1987, abandoned, which is a division of Ser. No. 661,456, Oct. 16, 1984, Pat. No. 4,687,917. This application Jun. 7, 1995, Ser. No. 479,132
Claims priority, application Japan, Oct. 19, 1983, 58-195434; Jan. 31, 1984, 59-15509; Jul. 4, 1984, 59-138809
Int. Cl.[6] G01J *1/20*
U.S. Cl. 250—201.8 4 Claims



1. A camera having a photo-taking lens and comprising:

an image sensing device having first areas and second areas;

an optical system which directs light from an object to be photographed to said first areas and said second areas, said

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image sensing device generating outputs according to intensity distributions of light incident on said first areas and said second areas;

a displacement detection device, responsive to said image sensing device, which detects amounts of displacement between intensity distributions of light at corresponding first areas and second areas, and which generates a plurality of displacement detection signals; and

a focus detection device which calculates an average value of amounts corresponding to said plurality of displacement detection signals, and which produces a focus detection signal corresponding to the focus of said photo-taking lens based on the calculated average value.

5,587,580

OPTOELECTRONIC SENSOR FOR MEASURING THE INTENSITY AND THE DIRECTION OF INCIDENCE OF A LIGHT BEAM

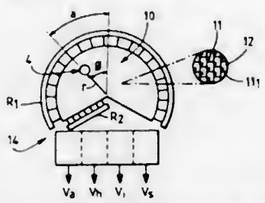
Philippe Venier, Grenchen; Patrick Debergh, Cressier, and Xavier Arreguit, Le Mont/Lausanne, all of Switzerland, assignors to CSEM Centre Suisse d'Electronique et de Microtechnique SA, Switzerland

Filed Oct. 25, 1995, Ser. No. 548,192

Claims priority, application France, Oct. 25, 1994, 94 13046

Int. Cl.[6] H01J *40/14;* **G01B** *11/26*

U.S. Cl. 250—206.1 **11 Claims**



1. An optoelectronic sensor for measuring the intensity and the direction of incidence of a light beam, the sensor being of the type comprising:

a matrix of pixels each including a photosensitive cell, the pixels being organized substantially in a plane so as to constitute an artificial retina;

an optical system designed to form a light spot on the matrix of pixels; and

a signal processor device for processing the signals delivered by the pixels under the effect of a light beam and comprising:

means for determining the geometrical center of the light spot on the matrix, the position of which is a function of the direction of incidence of the light beam; and

means for determining the intensity of the light beam;

wherein the means for determining the geometrical center of the light spot are constituted by:

two arrays of connections between the pixels of the matrix, said arrays substantially constituting radii and concentric circles, the coordinates of the light spot on the matrix giving an image of the azimuth angle and of the elevation angle of the incident light beam; and

circuits associated with the two arrays of connections between pixels respectively for calculating the azimuth coordinate and the elevation coordinate of the incident light beam.

5,587,581

METHOD AND AN APPARATUS FOR AN AIR SAMPLE ANALYSIS

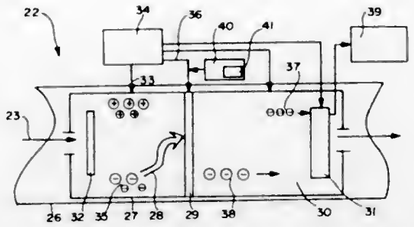
Peter C. Stroosnyder, Finksburg, Md., assignor to Environmental Technologies Group, Inc., Baltimore, Md.

Filed Jul. 31, 1995, Ser. No. 509,382

Int. Cl.[6] B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—287 **5 Claims**

3. In an apparatus for an air sample analysis,



wherein the apparatus includes a cell comprising a reactor region, a drift region, a shutter grid separating the reactor region and the drift region, and a charge collector,

wherein the sample of air containing molecules of different species is introduced to the reactor region and the molecules are polarized, thereby producing ions of positive and negative polarities to be separated,

wherein electric fields applied to the cell determine a background polarity of ions to be analyzed,

wherein an electric field applied to the shutter grid allows a pass to the drift region to the ions of said background polarity,

wherein, once the electric fields at the cell are switched, ions of opposite to said background polarity are to be analyzed, and the electric field at the shutter grid is switched to allow the ions of said opposite to said background polarity to enter the drift region, thereby switching the background polarity to an opposite background polarity in the drift region,

wherein the ions arrive to the charge collector and produce a charge spectrum to be analyzed, and

wherein the switching of the electric fields at the cell may influence a charge spectrum corresponding to the ions of said opposite to said background polarity thereby upsetting results of the sample analysis,

an improvement for stabilizing equilibrium conditions associated with the switching of the electric fields at the cell, comprising means for modulating a duty cycle of the electric field at the shutter grid, the duty cycle including an open time and a closed time for ions of a certain polarity, and

wherein during the switching of the electric fields at the cell, the open time is extended, thereby providing additional ions of said opposite to said background polarity to enter the drift region and thereby more rapidly changing a background polarity in the drift region to the opposite to said background polarity.

5,587,582

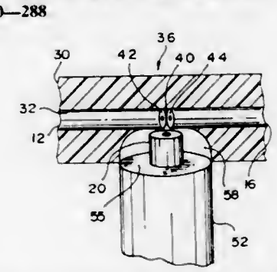
SELF-ALIGNING LIQUID JUNCTION

Jack D. Henion, Trumansburg; Robin L. Sheppard, Canandaigua, and Timothy Wachs, Ithaca, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 19, 1995, Ser. No. 444,542

Int. Cl.[6] B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—288 **11 Claims**



1. An interface for transferring analyte from a capillary electrophoresis system to a mass spectrometer, comprising:

a T fitting having a top arm and an intersecting leg;

a support tube having a longitudinal axis, an entrance end and an exit end extending through said top arm of said T fitting to produce a continuous axial bore through said arm;

a supply tube for supplying analyte to be analyzed located in said entrance end of said support tube;

an outlet tube for receiving analyte from said supply tube, said outlet tube being located in said exit end of said support tube, said supply tube and said outlet tube meeting in end-to-end relationship at a junction within said support tube bore and being axially aligned by said support tube;

a window in said support tube at the junction; and

a make-up tube having a longitudinal axis and extending into said intersecting leg of said T fitting, said axis of said make-up tube intersecting said axis of said support tube at said window for supplying make-up fluid to said junction of said supply tube and said outlet tube.

5,587,583

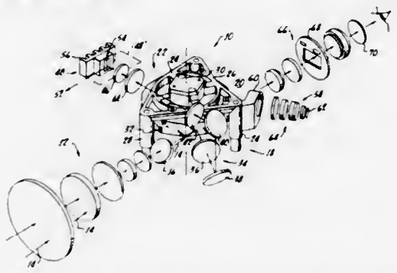
THERMAL IMAGING DEVICE

Richard Chin, Torrance, and David Le Fevre, Redondo Beach, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Sep. 6, 1995, Ser. No. 524,037

Int. Cl.[6] H04N *5/33;* **H01L** *27/16;* **G02B** *26/10;* **G01J** *1/42*

U.S. Cl. 250—332 **12 Claims**



1. A thermal imaging device for receiving thermal infrared radiation from a scene and responsively providing a visible-light image replicating the scene, said thermal imaging device including a detector having an arrayed plurality of infrared detector elements responsive to infrared radiation, each of said plurality of detector elements providing one of a corresponding plurality of individual electrical signals each indicative of the thermal infrared radiation incident thereon, a multiplexer circuit receiving said corresponding plurality of individual electrical signals and responsively providing a serial analog image signal, said thermal imaging device comprising:

an analog signal processor (ASP) integrated circuit (IC) for receiving said serial analog image signal and providing a processed serial analog image signal, said ASP IC including:

a global responsivity control circuit receiving said serial analog image signal and applying a constant global responsivity multiplier which is individual to said detector and which has been calibrated by reference to an external standard thermal source to provide a responsivity-corrected serial analog image signal;

a gain control circuit receiving said responsivity-corrected serial analog image signal and receiving a gain control signal, and multiplying said responsivity-corrected serial analog image signal with said gain control signal to provide a gain-corrected serial analog image signal.

5,587,584

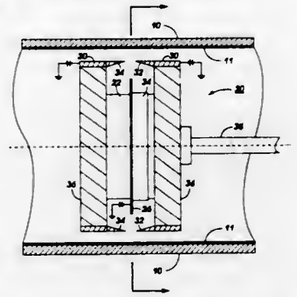
APPARATUS FOR CHARGING A FILM ON THE INTERNAL SURFACE OF A DRUM

Richard F. Bergen, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1996, Ser. No. 623,800

Int. Cl.[6] H01T *19/04*

U.S. Cl. 250—325 **6 Claims**



1. A scorotron charging apparatus adapted to apply an ion charge to a film positioned on the interior circumference of a drum, comprising:

an insulating core member having an outer surface;

a metallic strip coronode wrapped around said insulating core, said metallic strip coronode having a series of teeth on one edge thereof that are bent orthogonal to said outer surface of said insulating core member; and

a conductive ring mounted surrounding said insulating core member, said conducting ring having a slit therein overlying said series of teeth of said coronode and through which ions exit to charge the film.

5,587,585

LIGHT WEIGHT GAMMA-CAMERA HEAD AND GAMMA-CAMERA ASSEMBLIES CONTAINING IT

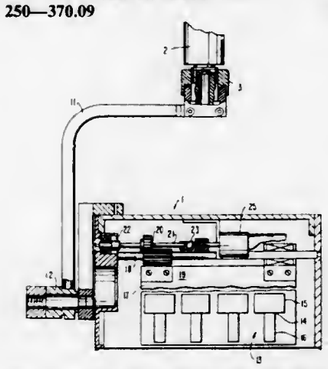
Yosef Eisen, 24, Tel-Aviv Street, Nes Zlona 70400; Chaim Gilat, 29, Moskovitz St., Rehovot 76468, and Glora Keinan, 10, Hayarden St., Rishon-LeZion 75236, all of Israel

Continuation-in-part of Ser. No. 157,713, Nov. 24, 1993, Pat. No. 5,365,069. This application Jun. 10, 1994, Ser. No. 257,876

Claims priority, application Israel, Jun. 2, 1993, 105881

Int. Cl.[6] G01T *1/24*

U.S. Cl. 250—370.09 **29 Claims**



1. A gamma-camera head having a detector assembly for the detection of x-rays and gamma-radiation, in which said detector assembly comprises an array of room temperature, solid state spectroscopy grade detectors each associated with a collimator and charge sensitive preamplifier means being a member selected from

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the group of preamplifiers, hybrid preamplifier/amplifier devices and application specific integrated circuits, which detectors and associated collimators and preamplification means are arranged in parallel rows extending in a first direction and suitably spaced from each other in a second direction normal to said first direction, each of said parallel rows holding a plurality of said room temperature spectroscopy grade solid state detectors, electric motor means being provided for moving said detector assembly in said second direction in a controlled fashion.

5,587,586

PARTICLE-OPTICAL APPARATUS COMPRISING AN ELECTRON SOURCE WITH A NEEDLE AND A MEMBRANE-LIKE EXTRACTION ELECTRODE

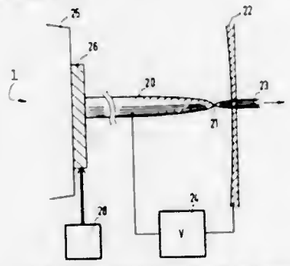
Pieter Kruit, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1995, Ser. No. 538,512

Claims priority, application European Pat. Off., Oct. 3, 1994, 94202853

Int. Cl.[6] H01J *37/073*

U.S. Cl. 250—423 F **17 Claims**



1. A particle-optical apparatus, comprising an electron source (1) for producing a beam (23) of free electrons, said electron source being provided with:

a needle-shaped conductor (20),

a membrane-like, electrically conductive extraction-electrode (22) which is arranged opposite to and at a small distance from the tip (21) of the needle-shaped conductor (20),

means (24) for applying an electric voltage between the needle-shaped conductor (20) and the extraction-electrode (22), characterized in that

the membrane-like extraction-electrode (22) is completely closed, and

the thickness of the extraction-electrode (22) is such that a practical fraction of electrons incident on the membrane under the influence of the electric voltage traverses the membrane to its other side with an energy loss which is negligibly small for all practical purposes.

5,587,587

ION IMPLANTING APPARATUS AND ION IMPLANTING METHOD

Hiroyuki Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1994, Ser. No. 284,992

Claims priority, application Japan, Aug. 5, 1993, 5-194931; Jul. 19, 1994, 6-167085

Int. Cl.[6] H01J *37/317;37/304*

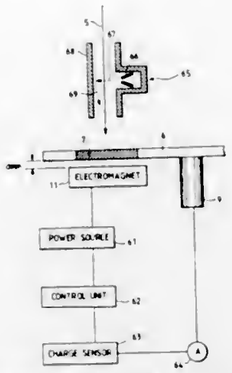
U.S. Cl. 250—492.21 **47 Claims**

1. An ion planting apparatus for irradiating a material subjected to implantation with a beam of ions from an ion source thereby implanting said ions into said material, comprising:

a magnet generating a magnetic force, positioned at a side of said material, opposite to a side thereof receiving said ion beam irradiation;

a charge sensor measuring a charge at a surface of said material on which the ion beam is irradiated, to thereby effect feedback control to said magnet in accordance with a variation measured in the charge; and

means for regulating a magnetic flux density by the magnetic force generated by said magnet based on the charge information from said charge sensor.



5,587,588

MULTIPLE MICRO-TIPS FIELD EMISSION DEVICE

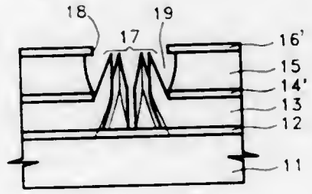
Jong-min Kim, Seoul, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Suwon-city, Rep. of Korea

Filed Jul. 31, 1995, Ser. No. 509,603

Claims priority, application Rep. of Korea, Mar. 28, 1995, 95-6748

Int. Cl.[6] H01L *29/06;* **H01J** *1/46;21/10*

U.S. Cl. 257—10 **16 Claims**



1. A field emission device, comprising:

a substrate;

an adhesion layer disposed on the substrate;

a cathode having a striped pattern disposed on the adhesion layer;

an insulation layer having a hole therein disposed above the cathode;

a plurality of micro-tips disposed on the cathode; and

a gate electrode, having an aperture defined around the micro-tips, and having a stripe pattern perpendicular to the striped pattern of the cathode, disposed on the insulation layer.

5,587,589

TWO DIMENSIONAL ORGANIC LIGHT EMITTING DIODE ARRAY FOR HIGH DENSITY INFORMATION IMAGE MANIFESTATION APPARATUS

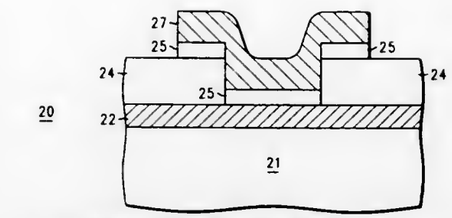
Franky So, Tempe; Song Q. Shi, Phoenix, and Thomas B. Harvey, III, Scottsdale, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Mar. 22, 1995, Ser. No. 408,677

Int. Cl.[6] H01L *35/24;51/00;33/00*

U.S. Cl. 257—40 **19 Claims**

1. A two dimensional organic light emitting diode array comprising:



an electrically insulative supporting substrate;

a plurality of laterally spaced apart, electrically conductive strips positioned on a surface of the supporting substrate so as to define a plurality of first electrodes;

a layer of dielectric medium positioned on an upper surface of the electrically conductive strips and the supporting substrate and defining a plurality of cavities through the layer of dielectric medium, one each of the plurality of cavities being positioned in overlying relationship to an associated first electrode of the plurality of first electrodes so as to expose a portion of an upper surface of the associated first electrode, and the layer of dielectric medium defining the plurality of cavities with each cavity defining an upper opening substantially equal in area to the exposed portion of the associated first electrode; and

an electroluminescent medium, including at least a layer of active emitter material and a layer of a low work function metal, positioned in each of the plurality of cavities on the exposed portion of the associated first electrode so as to form a light emitting diode in each of the plurality of cavities in conjunction with the associated first electrode; and

a layer of ambient stable metal sealingly positioned over the cavities so as to electrically contact the low work function metal in each of the cavities and to seal the upper openings in each of the cavities, the layer of ambient stable metal defining a plurality of laterally spaced apart, metallic strips orthogonal to the electrically conductive strips, the laterally spaced apart, metallic strips defining a second electrode for each of the light emitting diodes.

5,587,590

TEST PIECE FOR X-RAY INSPECTION

Yoshihisa Matsubara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 3, 1994, Ser. No. 335,390

Claims priority, application Japan, Nov. 15, 1993, 5-306998

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—48 **5 Claims**

1. A sample of metal silicide film for facilitating inspection of a crystal structure of said film by an X-ray diffraction process, said sample comprising one or more stripes of metal silicide, each stripe of metal silicide having a width which is smaller than a diameter of a particle of the metal silicide, wherein said one or more stripes each has a width equal to or smaller than about 1.0 μm.

5,587,591

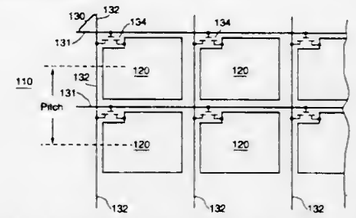
SOLID STATE FLUOROSCOPIC RADIATION IMAGER WITH THIN FILM TRANSISTOR ADDRESSABLE ARRAY

Jack D. Kingsley, Grand Junction, Colo., and George E. Possin, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1993, Ser. No. 174,921

Int. Cl.[6] H01L *29/04*

U.S. Cl. 257—59 **23 Claims**



1. A solid state fluoroscopic radiation imager for imaging a subject illuminated by incident radiation having wavelengths in a predetermined range, said radiation imager comprising:

a large area photosensor array comprising a plurality of photosensors arranged in a pattern so as to have a predetermined pitch, said photosensor array further comprising an addressable thin film transistor (TFT) array comprising a plurality of low charge retention TFTs, respective ones of said TFTs being electrically coupled to respective ones of said photosensors so as to selectively address respective photosensors in said photosensor array;

each of said low charge retention TFTs having a TFT switched silicon region selected to provide low charge retention; the numerical value of the area of said switched silicon region as expressed in square microns being not substantially greater than the numerical value of said predetermined pitch as expressed in microns.

5,587,592

Patent Not Issued For This Number

5,587,593

LIGHT-EMITTING SEMICONDUCTOR DEVICE USING GROUP III NITROGEN COMPOUND

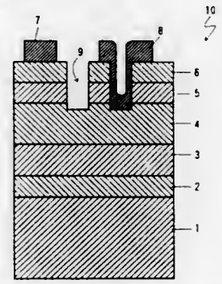
Norikatsu Koide; Shiro Yamazaki; Junichi Umezaki, and Shinya Asami, all of Aichi-ken, Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, and Research Development Corporation of Japan, Saitama-ken, both of Japan

Filed Apr. 19, 1995, Ser. No. 423,938

Claims priority, application Japan, Apr. 20, 1994, 6-106059

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—94 **1 Claim**



1. A light-emitting semiconductor device comprising:

a sapphire substrate;

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an n-layer with n-type conduction of group III nitride compound semiconductor satisfying the formula $Al_xGa_yIn_{1-x-y}N$, $0 \leqq x \leqq 1$ $0 \leqq x \leqq 1$, and $0 \leqq x+y \leqq 1$;

a magnesium (Mg) doped p-layer with p-type conduction of group III nitride compound semiconductor satisfying the formula $Al_xGa_yIn_{1-x-y}N$, $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, and $0 \leqq x+y \leqq 1$; and

wherein a plane orientation of said sapphire substrate is set at an off angle within the range of 1 to 4 degrees from an axis "a" <11$\bar{2}$0> of said sapphire substrate.

5,587,594

SEMICONDUCTOR COMPONENT HAVING GATE-TURN-OFF THYRISTOR AND REDUCED THERMAL IMPAIRMENT

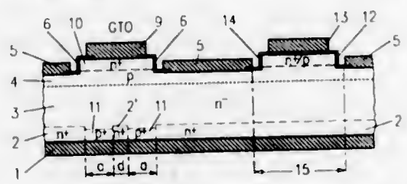
André Jaecklin, Ennetbaden; Ezatollah Ramezani, Möriken; Peter Roggwiller, Riedt Neerach; Andreas Ruegg, Gebenstorf, all of Switzerland; Thomas Stockmeier, Rancho Palos Verdes, Calif.; Peter Streit, Widen, and Jürg Waldmeyer, Dottikon, both of Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Jan. 20, 1995, Ser. No. 375,662

Claims priority, application Germany, Feb. 4, 1994, 44 03 429.6

Int. Cl.[6] H01L *29/74*

U.S. Cl. 257—138 **22 Claims**



1. A gate-turn-off semiconductor component with a disk-like semiconductor body comprising:

at least one GTO thyristor structure, said at least one GTO thyristor structure further including:

a) at least one p-conducting p⁺anode emitter layer adjacent to a metal anode of electrical conductivity;

b) an n-conducting n⁻base layer adjoining the p⁺anode emitter layer;

c) a p-conducting p-type base layer adjoining the n⁻base layer;

d) an n-conducting n⁺cathode emitter layer adjoining the p-type base layer, and adjoining a metal cathode of electrical conductivity on a cathode side of the semiconductor component; and

e) a control electrode;

at least one cooling segment peripherally and laterally adjacent to the at least one GTO thyristor structure, which shares the metal anode with the at least one GTO thyristor structure, the cooling segment having a cooling segment metallization on the cathode side; and

an electrical insulation layer provided between the cooling segment metallization and the disk-like semiconductor body.

5,587,595

LATERAL FIELD-EFFECT-CONTROLLED SEMICONDUCTOR DEVICE ON INSULATING SUBSTRATE

Horst Neubrand, Frankfurt; Jacek Korec, Mörfelden-Walldorf; Erhart Stein, Senftenberg, and Dieter Silber, Obertshausen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

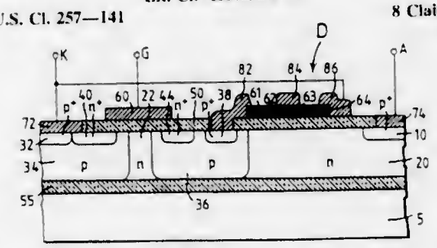
PCT No. PCT/EP93/02216, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/06158, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 19, 1993, Ser. No. 387,778

Claims priority, application Germany, Aug. 29, 1992, 42 28 832.0

Int. Cl.[6] H01L *29/745*

U.S. Cl. 257—141 **8 Claims**



1. A field-effect-controlled semiconductor device, having a cathode (K), an anode (A) and a gate (G), the field-effect-controlled semiconductor device extending laterally on a first insulating layer (55) covering a substrate (5), the field-effect-controlled semiconductor device comprising:

(I) a main thyristor including:

a first anode-end emitter region (10) forming the anode (A) of the field-effect-controlled semiconductor device;

a first base region (20) bordering the first insulating layer (55) and the first anode-end emitter region (10), and being of an opposite conductivity-type material than the first anode-end emitter region (10);

a second base region having first and second parts;

wherein the first part (36) of the second base region borders the first base region (20) and the first insulating layer (55), and is of the same conductivity-type material as the first anode-end emitter region (10);

wherein a highly doped region (38) is embedded in the first part (36) of the second base region; and

wherein the second part (34) of the second base region borders the first insulating layer (55), and is of the same conductivity-type material as the first part (36) of the second base region;

a second emitter region (44) of the main thyristor, the second emitter region bordering the first part (36) of the second base region;

an intermediate region (22) totally separating the first part (36) of the second base region from the second part (34) of the second base region, the intermediate region (22) being of an opposite conductivity-type material than the first (36) and second (34) parts of the second base region; and

a second insulating layer (50), the second insulating layer (50) being an oxide layer;

wherein all of the regions of the main thyristor are disposed under at least one of:

the second insulating layer (50), and/or

metallic electrodes;

(II) a MOSFET switching device including:

the second emitter region (44), disposed under the second insulating layer (50), and forming a drain of the MOSFET switching device;

a cathode-end emitter region (40), bordering the second part (34) of the second base region, the cathode-end emitter region (40) being partly covered by the second insulating layer (50) and contacting a cathode electrode (72) at the cathode (K) of the device, the cathode-end emitter region (40) forming a source of the MOSFET switching device; and

a gate electrode (60) formed on the second insulating layer (50) above the intermediate region (22), thereby forming the gate (G) of the field-effect-controlled semiconductor device; and

(III) a diode device (D) connecting the highly doped region (38) embedded in the first part (36) of the second base region, to the cathode (K) of the field-effect-controlled semiconductor device.

5,587,596

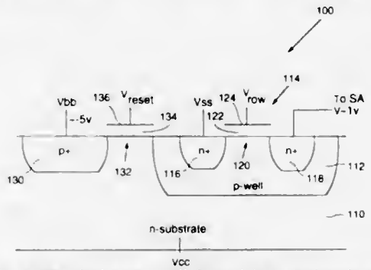
SINGLE MOS TRANSISTOR ACTIVE PIXEL SENSOR CELL WITH AUTOMATIC ANTI-BLOOMING AND WIDE DYNAMIC RANGE

Min-Hwa Chi; Albert Bergemont, both of Palo Alto, and Hosam Haggag, Mountain View, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 20, 1995, Ser. No. 531,582

Int. Cl.[6] H01L *31/062*

U.S. Cl. 257—223 **12 Claims**



1. An active pixel sensor cell formed in a semiconductor substrate of a first conductivity type, the cell comprising:

a first well region of a second conductivity type formed in the substrate;

a pixel transistor that includes spaced-apart drain and source regions of the first conductivity type formed in the first well region to define a first channel region therebetween, and a first conductive gate formed over the first channel region and separated therefrom by dielectric material, the first conductive gate connected to receive a row signal;

a second well region of the second conductivity type formed in the substrate a distance apart from the first well region to define a second channel region therebetween; and

a second conductive gate formed over the second channel region and separated therefrom by dielectric material, the second conductive gate connected to receive a reset signal.

5,587,597

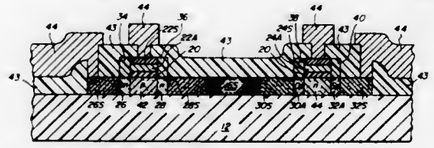
SEMICONDUCTOR-ON-INSULATOR DEVICE INTERCONNECTS

Ronald E. Reedy; Graham A. Garcia, and Isaac Lagnado, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 380,175, Jul. 13, 1989, Pat. No. 5,066,613. This application Jul. 11, 1991, Ser. No. 728,917

Int. Cl.[6] H01L *27/12;29/04;31/062;31/0392*

U.S. Cl. 257—351 **23 Claims**



1. An integrated circuit comprising:

an insulating substrate;

a patterned layer of semiconductor material formed on and in contact with said substrate, having a top surface and a bottom surface which is in contact with said substrate, and including a first set of regions and a second set of regions extending between said top surface and said bottom surface, said semiconductor material comprising solid phase epitaxially improved single crystal silicon;

at least one semiconductor device formed in said first set of regions; and

at least one connection region comprised of a metallic compound of said semiconductor material formed in said second set of regions, extending through the entire portion of said second set of regions between said top surface and said bottom surface and being in contact with said at least one semiconductor device.

5,587,598

SEMICONDUCTOR DEVICE WITH CHARGE-UP PREVENTING FUNCTION

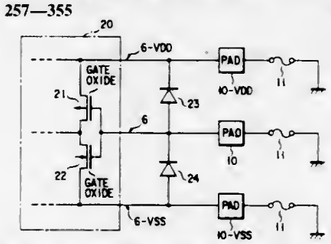
Kazuhisa Hatanaka, Kitakami, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 186,846, Jan. 27, 1994, abandoned. This application Feb. 7, 1996, Ser. No. 598,138

Claims priority, application Japan, Jan. 27, 1993, 5-011622

Int. Cl.[6] H01L *23/62;29/00*

U.S. Cl. 257—355 **15 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate;

an integrated circuit portion formed in said semiconductor substrate;

a first level conductive layer formed on said semiconductor substrate;

a second level conductive layer formed above said first level conductive layer;

a wiring layer formed by a first portion of said first level conductive layer, said wiring layer having a first end connected to said integrated circuit portion, and a second end;

a pad formed by a first portion of said second level conductive layer, said pad connected to said wiring layer; and

a fuse formed by a stacked arrangement of a second portion of said second level conductive layer and a second portion of said first level conductive layer, said fuse connected between said second end of said wiring layer and said semiconductor substrate.

5,587,599

BIPOLAR TRANSISTOR AND MANUFACTURING METHOD

Reinhard Mahnkopf, and Andreas Vom Felde, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 23, 1995, Ser. No. 449,213

Claims priority, application Germany, May 25, 1994, 44 18 206.6

Int. Cl.[6] H01L *29/76;21/265*

U.S. Cl. 257—370 **17 Claims**

1. A bipolar transistor in a body silicon layer on an insulation layer of a SOI substrate, comprising:

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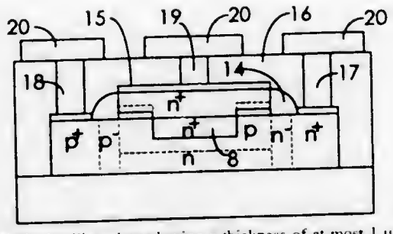


said body silicon layer having a thickness of at most 1 μm;

with respect to said body silicon layer, a collector region doped for a first conductivity type, a base region doped for a second conductivity type opposite said first conductivity type, and an emitter region doped for said first conductivity type arranged vertically above one another;

contacts for collector, base and emitter;

said contacts respectively electrically connected to said collector region, to said base region and to this emitter region;

said collector region being limited by said insulation layer at a side facing away from said base region; and

said collector region having a thickness and doping density wherein the product of the square of said thickness and said doping density is less than 8×10^{6} cm^{-1} and such that the collector region is substantially depleted of charge carriers when potentials required for a predetermined employment of the bipolar transistor are applied.

5,587,600

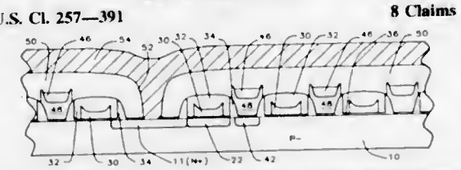
SERIES MOS ROM WITH TAPERED OXIDE SIDE WALLS

Ming T. Yang, Hsin-Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Continuation of Ser. No. 404,117, Mar. 14, 1995, abandoned, which is a continuation of Ser. No. 120,795, Oct. 4, 1993, abandoned, which is a division of Ser. No. 941,807, Sep. 8, 1992, Pat. No. 5,264,386. This application Apr. 23, 1996, Ser. No. 636,684

Int. Cl.[6] H01L *27/112*

U.S. Cl. 257—391 **8 Claims**



1. An improved read-only-memory device having spaced source and drain regions in a semiconductor substrate, a plurality of very narrow, closely spaced, gate electrodes spanning the distance between the source and drain regions, and an overlying gate oxide layer, the improvement comprised of:

electrodes comprising first and second alternating polycrystalline silicon lines on said gate oxide layer, said first lines having sidewalls, and being spaced from each other by approximately the width of each first line; and

tapered sidewall spacer elements of insulating material along said sidewalls of each of said first lines, so that said first and second lines are separated by tapered sidewall spacer elements and said first and second lines are more closely spaced near an upper surface of said first lines.

5,587,601

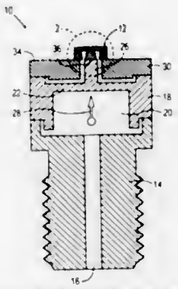
SUPPORT STRUCTURE FOR A SEMICONDUCTOR PRESSURE TRANSDUCER

Anthony D. Kurtz, Teaneck, N.J., assignor to Kulite Semiconductor Products, Inc., Leonia, N.J.

Filed Jun. 5, 1995, Ser. No. 465,120

Int. Cl.[6] H01L *29/82*

U.S. Cl. 257—417 **16 Claims**



1. A support structure for semiconductor transducer elements in a pressure transducer assembly, comprising:

a plurality of semiconductive substrates arranged in a composite structure having a top substrate layer, upon which said transducer elements are disposed, and at least one lower substrate layer, wherein a first groove is disposed in said top substrate layer creating an area of reduced thickness in said top substrate layer below said transducer elements and a second groove is disposed through said at least one lower substrate layer that communicates with said first groove, thereby creating a continuous open region through said composite structure below said area of reduced thickness, said second groove being continuous thereby defining the periphery of a boss region in said at least one lower substrate layer that is coupled to said top substrate layer.

5,587,602

Patent Not Issued For This Number

5,587,603

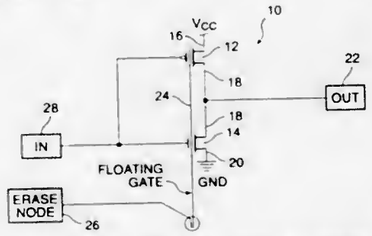
TWO-TRANSISTOR ZERO-POWER ELECTRICALLY-ALTERABLE NON-VOLATILE LATCH

Vikram Kowshik, Fremont, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Filed Jan. 6, 1995, Ser. No. 369,760

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **3 Claims**



1. A two-transistor, zero-power, electrically-alterable non-volatile latch element comprising:

an input node;

an output node;

an erase node;

a P-Channel MOS transistor having a source connected to a source of a first electrical potential, a drain connected to said output node, a control gate connected to said input node, and a floating gate capacitively coupled to said control gate;

an N-Channel MOS transistor having a source connected to a source of a second electrical potential lower than said first electrical potential, a drain connected to said output node, a control gate connected to said input node, and a floating gate capacitively coupled to said control gate and common to said floating gate of said P-Channel MOS transistor;

said floating gates of said P-Channel MOS transistor and said N-Channel MOS transistor capacitively coupled to said erase node via a tunnel dielectric.

5,587,604

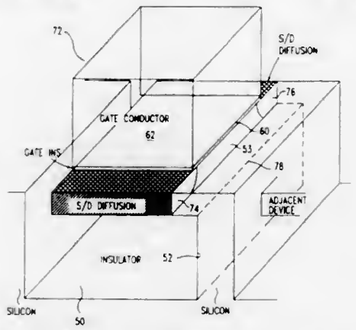
CONTACTED BODY SILICON-ON-INSULATOR FIELD EFFECT TRANSISTOR

Brian J. Machesney, Burlington, Vt.; Jack A. Mandelman, Stormville, N.Y., and Edward J. Nowak, Essex, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1994, Ser. No. 310,691

Int. Cl.[6] H01L *27/01;27/12*

U.S. Cl. 257—350 **18 Claims**



1. A semiconductor structure comprising:

a semiconductor substrate having a buried dielectric defining lower and upper regions of said substrate, said upper region being monocrystalline;

an FET comprising a gate dielectric located on a portion of said upper region of said substrate; a gate located above said gate dielectric, said gate having a first side, a second side, and a third side; and a source diffusion and a drain diffusion within said upper region, said source diffusion along said first side, said drain diffusion along said second side; and

an electrical connection between said upper region and said lower region, said connection having an edge substantially co-aligned with said third side of said gate, there being no mask alignment tolerance spacing between said connection and said third side of said gate.

5,587,605

PACKAGE FOR MATING WITH A SEMICONDUCTOR DIE

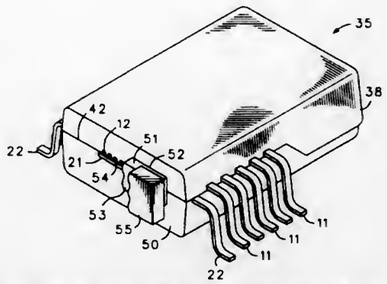
Kenneth C. Ramsey, Gilbert; William J. Miller, Mesa, and William M. Strom, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 155,880, Nov. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 473,833

Int. Cl.[6] H01L *23/495;27/15;31/12*

U.S. Cl. 257—666 **21 Claims**

1. An interconnect package, comprising at least one patterned leadframe having a plurality of leads, each of the plurality of leads



having at least two ends which exit the interconnect package in at least one plane, wherein one end of at least one of the plurality of leads is for mating with a semiconductor chip.

5,587,606

LEAD FRAME HAVING DEFLECTABLE AND THEREBY PRECISELY REMOVED TIE BARS

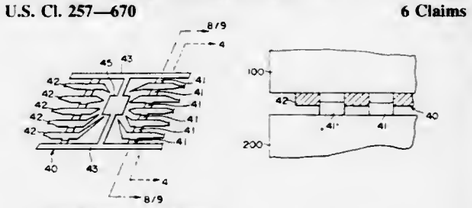
Takashi Sekiba, Murata-machi, Japan, assignor to Fujitsu Miyagi Electronics Ltd., Shibata, Japan

Division of Ser. No. 165,466, Dec. 13, 1993, Pat. No. 5,422,314. This application Feb. 16, 1995, Ser. No. 389,760

Claims priority, application Japan, Mar. 19, 1993, 5-060639

Int. Cl.[6] H01L *21/60;23/50*

U.S. Cl. 257—670 **6 Claims**



1. A lead frame comprising:

a die pad on which a semiconductor chip is mounted;

a plurality of leads each having an end which faces said die pad; and

tie bars connecting said leads, wherein each of said tie bars is formed so as to project from a surface of each of said leads by an amount sufficient to break a boundary between a tie bar and a lead when the tie bar is pushed back so that the tie bar and lead are separated.

5,587,607

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING IMPROVEMENT ARRANGEMENT OF PADS

Kenichi Yasuda; Kiyohiro Furutani, and Hiroshi Miyamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,301

Claims priority, application Japan, Sep. 9, 1993, 5-224481; Jul. 14, 1994, 6-162087

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—690 **9 Claims**

1. A semiconductor integrated circuit device, comprising:

a package;

a semiconductor chip housed in said package and selectively carrying out any of a plurality of first predetermined operations;

a plurality of leads each disposed from the outside of said package to a periphery of said semiconductor chip, said plurality of leads including a first power supply lead for receiving a power supply potential and a second power supply lead positioned apart from said first power supply lead for receiving a power supply potential;

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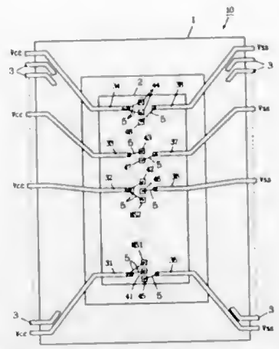


a first power supply pad disposed on said semiconductor chip and connected to said first power supply lead;

a second power supply pad disposed on said semiconductor chip and connected to said second power supply lead;

a first selection pad disposed in the vicinity of said first power supply lead on said semiconductor chip and having one of a connection state to said first power supply lead and a disconnection state therefrom;

a second selection pad disposed in the vicinity of said second power supply lead on said semiconductor chip and having one of a connection state to said second power supply lead and a disconnection state therefrom; and

first selecting means responsive to said connection/disconnection states of said first and second selection pads for selecting any of said plurality of first predetermined operations.

5,587,608

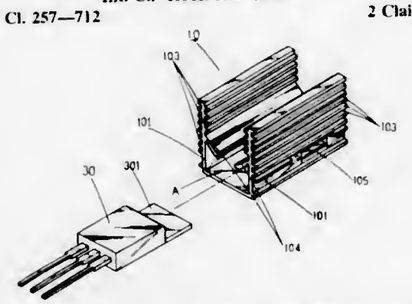
STRUCTURE HEAT SINK FOR POWER SEMICONDUCTORS

Ching-Ming Meng, No. 59, Jinn Shiun 2nd St., Yangmei City, Taoyuan, Taiwan

Filed Oct. 27, 1995, Ser. No. 549,231

Int. Cl.[6] H01L *23/34;23/28*

U.S. Cl. 257—712 **2 Claims**



1. An improved extruded aluminum heat sink structure for coupling to a power semiconductor device, comprising a longitudinally extended body member having a U-shaped cross-sectional contour defined by a pair of upright lateral walls disposed on opposing longitudinal sides of a bottom wall, each of said lateral walls having opposing inner and outer side surfaces and a plurality of longitudinally extended heat dissipation fins integrally formed and extending from both said inner and said outer side surfaces in spaced parallel relationship, said body member having a pair of fastener plates integrally formed and extending respectively from said inner side surfaces of said pair of lateral walls, each of said fastener plates being inclined toward said bottom wall and spaced therefrom by a first predetermined dimension to form a containment slot for receiving a body portion of the power semiconductor device therein, said body member having a pair of fastener tabs respectively extending from said inner side surfaces of said pair of lateral walls into said containment slot, each of said fastener tabs being formed by displacement of a portion of a respective lateral side wall subsequent to extrusion of said body member in one piece, each of said fastener tabs being spaced from said bottom wall by a second predetermined dimension to define a second portion of said containment slot, said first predetermined dimension being less than a thickness dimension of the body portion of the power semiconductor device and said second predetermined dimension being less than a thickness dimension of a mounting tab portion of the power semiconductor device for securement of the body portion of the power semiconductor device within said first portion of said containment slot and the mounting tab portion thereof with in said second portion of said containment slot.

5,587,609

II-VI GROUP COMPOUND SEMICONDUCTOR DEVICE METALLIC NITRIDE OHMIC CONTACT FOR P-TYPE

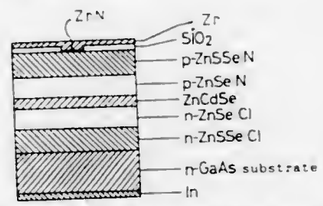
Masanori Murakami, Tsuzuki-gun; Yasuo Koide, Kyoto; Nobuaki Teraguchi, and Yoshitaka Tomomura, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1995, Ser. No. 409,307

Claims priority, application Japan, Mar. 24, 1994, 6-053588

Int. Cl.[6] H01L *29/45;29/43;23/48*

U.S. Cl. 257—744 **6 Claims**



1. A II-VI group compound semiconductor device having a p-type $Zn_xMg_{1-x}S_ySe_{1-y}$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$) semiconductor layer, on which an electrode layer is formed with at least metallic nitride layer lying between the semiconductor layer and the electrode.

5,587,610

SEMICONDUCTOR DEVICE HAVING A CONDUCTIVE LAYER WITH AN APERTURE

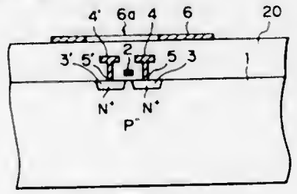
Masayuki Watanabe, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 102,260, Aug. 5, 1993, abandoned. This application Oct. 26, 1994, Ser. No. 330,093

Claims priority, application Japan, Aug. 6, 1992, 4-209903

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—758 **7 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

a circuit element having a first electrode, a second electrode, and an impurity diffusion region of a second conductivity type formed in said semiconductor substrate and connected to said second electrode, and said first electrode is formed over said semiconductor substrate;

an insulating layer formed to cover said circuit element; and

a conductive layer formed on said insulating layer over said circuit element, an aperture being selectively formed in said conductive layer such that respective parts of said first and second electrodes and said impurity diffusion region are exposed through said aperture such that electrical continuity of said conductive layer is retained.

5,587,611

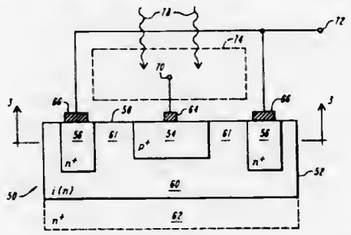
COPLANAR X-RAY PHOTODIODE ASSEMBLIES

Alexander T. Botka, Cambridge, Vt.; Ben Tuval, Brookline, and Sorin Marcovici, Lexington, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed May 8, 1995, Ser. No. 436,572

Int. Cl.[6] H01L *27/146;31/075;31/115*

U.S. Cl. 257—458 **40 Claims**



1. A coplanar, non-dielectrically isolated photodiode for X-ray detection comprising semiconductor means having an absorption face and adjoining said face: (a) a single, elongated first doped region having a first polarity and defined by planar walls extending substantially perpendicularly from said absorption face into said semiconductor means to a first depth; (b) a second doped region having a polarity opposite that of said first doped region and defined by planar walls extending substantially perpendicularly from said absorption face into said semiconductor means to a second depth that is substantially equal to or greater than said first depth; (c) a substantially undoped region extending from said absorption face into said semiconductor means so as to separate and completely surround both of said first and second regions and to create a single p-n junction between said first and second doped regions; and (d) first electrical contact means connected to said first region along said absorption face.

5,587,612

SEMICONDUCTOR DEVICE HAVING SEMICONDUCTOR ACTIVE AND DUMMY REGIONS WITH THE DUMMY REGIONS LOWER IN HEIGHT THAN THE ACTIVE REGIONS

Mitsuhiro Sugiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 11, 1995, Ser. No. 526,177

Claims priority, application Japan, Sep. 9, 1994, 6-215924

Int. Cl.[6] H01L *29/00;27/01*

U.S. Cl. 257—506 **6 Claims**

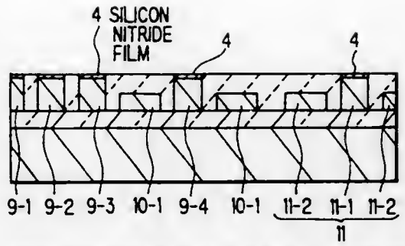
1. A semiconductor device, comprising:

a substrate;

an insulating layer formed on said substrate;

a plurality of island semiconductor regions which are formed on said insulating layer and are isolated from each other by an insulator, each of said plurality of island semiconductor regions forming a semiconductor element therein; and

a dummy semiconductor region which is formed on said insulating layer and is buried in said insulator, wherein said



dummy semiconductor region is adjacent to at least one of said plurality of island semiconductor regions and is lower than said plurality of island semiconductor regions.

5,587,613

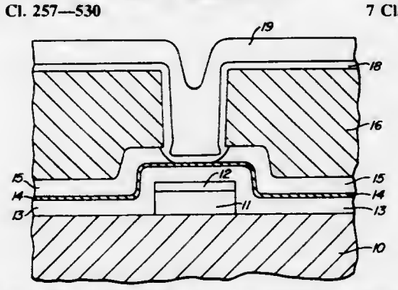
LOW-CAPACITANCE, ISOTROPICALLY ETCHED ANTIFUSE AND METHOD OF MANUFACTURE THEREFOR

Ali Iranmanesh, Sunnyvale, Calif., assignor to Crosspoint Solutions, Inc., Santa Clara, Calif.

Filed May 25, 1994, Ser. No. 248,771

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—530 **7 Claims**



1. An antifuse structure in an integrated circuit comprising

a first metal interconnection line;

a programming layer over said first interconnection line;

an etch stop layer over said programming layer, said etch stop layer from 20 to 40 Å thick;

a buffer layer over said etch step layer, said buffer from 300 to 800 Å thick;

an insulating layer over said buffer layer, said buffer layer having etching characteristics different from said insulating layer and said etch stop layer, said insulating layer being relatively thick with respect to said etch stop layer and having an aperture therethrough, said aperture further extending through said buffer layer, said insulating layer from 5000 to 15000 Å thick; and

a second interconnection line over said insulating layer and in said aperture;

whereby said antifuse structure has low capacitance and a consistent programming voltage.

5,587,614

MICROPLANARIZATION OF ROUGH ELECTRODES BY THIN AMORPHOUS LAYERS

Chorng-Lii Hwang, Wappingers Falls, N.Y., and Clarence W. Teng, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 397,001, Mar. 1, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 473,807

Int. Cl.[6] H01L *27/02;27/00*

U.S. Cl. 257—532 **7 Claims**

1. A capacitor structure for an integrated circuit comprising:

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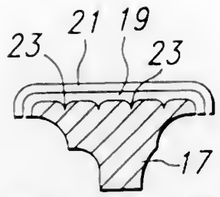


(a) an electrode having a polycrystalline material surface having voids extending to said surface;

(b) a first thin layer of a dielectric over the polycrystalline material;

(c) a layer of an amorphous form of said material over said first thin layer, the amorphous layer disposed within said voids;

(d) a second thin layer of a dielectric over said amorphous layer; and

(e) a layer of electrical conductor spaced from said material over said second thin layer.

5,587,615

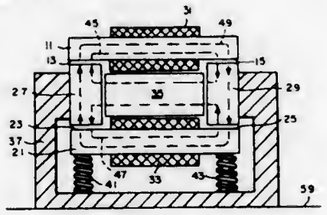
ELECTROMAGNETIC FORCE GENERATOR

Bruce S. Murray, Winchester; Howard C. Noble, Cohasset, and Wilma W. Quinn, Wakefield, all of Mass., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Dec. 22, 1994, Ser. No. 362,133

Int. Cl.[6] H02K *33/12*

U.S. Cl. 310—30 **9 Claims**



1. An electromagnetic force generator comprising:

a first elongate magnetic core having transversely facing pole faces at each end;

a second elongate magnetic core essentially paralleling said first core and spaced therefrom in fixed relation and having transversely facing pole faces at each end aligned with corresponding pole faces of said first core;

between each pair of aligned pole faces, a relatively moveable magnetic core, each of said moveable cores being moveable in the direction extending between the respective aligned pole faces;

a magnet mounted in fixed relation between said first and second cores and being polarized along an axis essentially paralleling the length of said first and second cores and extending at each end to a point adjacent to said relatively moveable cores thereby to establish respective sliding gaps;

means for attaching said moveable cores to a structure to which force is to be applied;

suspension means providing a compliant mechanical connection between said relatively moveable cores and said first and second cores; and

respective windings around said first and second cores whereby a.c. energization of said windings will generate a corresponding vibratory force between said moveable cores and said first and second cores.

5,587,616

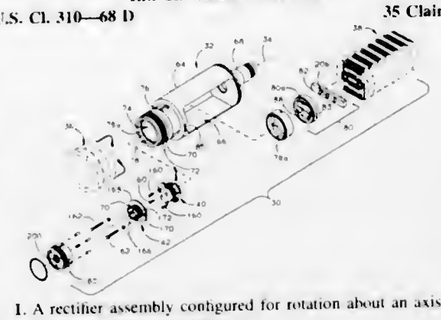
ROTOR FOR A DYNAMOELECTRIC MACHINE HAVING A ONE-PIECE ROTATION RECTIFIER

Tyrone A. Johnsen, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 4, 1993, Ser. No. 57,718

Int. Cl.[6] H02K *11/00;1/32*

U.S. Cl. 310—68 D **35 Claims**



1. A rectifier assembly configured for rotation about an axis of rotation, the rectifier comprising:

(a) two axially-spaced field plates having generally planar major surfaces oriented perpendicularly to the axis of rotation;

(b) two layers of diodes sandwiched between the field plates;

(c) a layer of phase plates electrically isolated from one another sandwiched between the layers of diodes; and

(d) means for integrally joining the diodes to the field plates and to the phase plates to form a unitary, laminated structure rotatable about the axis of rotation.

5,587,617

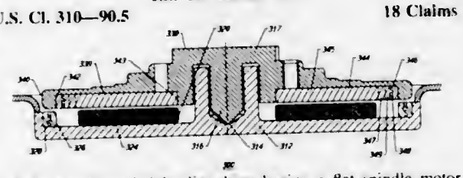
INTEGRATED PASSIVE MAGNETIC BEARING SYSTEM AND SPINDLE MAGNET FOR USE IN AN AXIAL MAGNET SPINDLE MOTOR

John C. Dunfield, and Kamran Oveyssi, both of Aptos, Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 289,949, Aug. 12, 1994. This application Jun. 7, 1995, Ser. No. 478,271

Int. Cl.[6] H02K *7/09*

U.S. Cl. 310—90.5 **18 Claims**



1. In a reduced height disc drive having a flat spindle motor assembly comprised of a spindle permanent magnet held in opposition to an electromagnet assembly attached to a stator, an apparatus for journaling a rotor having a hub shaft about said stator of said flat spindle motor comprising:

said stator comprising a base portion and a stator well, said stator well comprising a raised centrally disposed cylindrical portion disposed on said base portion, said stator well for receiving said hub shaft;

a pivot, said pivot for pivotally displacing said rotor about said stator, said pivot for engaging said hub shaft at a base portion of said stator well;

a first annular disc, said disc comprising an axially aligned magnetic pole, said disc radially extending from said stator;

a spindle permanent magnet having a first and second end and non-magnetized region disposed there between, said first end comprising a plurality of magnetic poles disposed on said rotor in opposition to said spindle motor electromagnet assembly, said second end comprised of a like axially aligned magnetic pole disposed on said rotor, opposing and offset to the inside of said axially aligned magnetic pole on said first annular disc; and

an annular base extension, said annular base extension integral to said base portion of said stator beginning at an exterior wall of said stator well and extending toward and at a height equal to said electromagnet assembly and directly beneath said first end of said spindle permanent magnet, whereby said rotor is pre-loaded due to the attractive forces developed between said annular base extension and said first end of said spindle permanent magnet.

5,587,618

DIRECT CURRENT HOMOPOLAR MACHINE

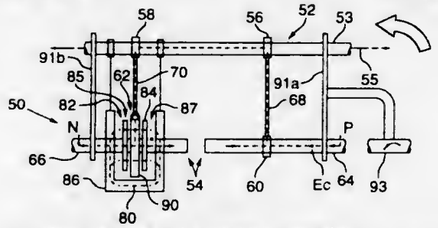
George D. Hathaway, 39 Kendal Avenue, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 155,628, Nov. 22, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,317

Claims priority, application Canada, Apr. 15, 1993, 2094078

Int. Cl.[6] H02K *49/00;31/00;16/00*

U.S. Cl. 310—178 **21 Claims**



1. A direct current electrical machine comprising:

an orbiting electrical conductor means comprising a first electrically conductive shaft means extending along an axis and having a first electrical connection means and a second electrical connection means displaced from the first electrical connection means along the axis;

a stationary set of electrical conductor means comprising:

a second electrically conductive shaft means having a third electrical connection means; and

a third electrically conductive shaft means having a fourth electrical connection means;

a first conductor means electrically coupling the first electrical connection means with the third electrical connection means;

a second conductor means electrically coupling the second electrical connection means with the fourth electrical connection means;

a first armature means comprising one of the four electrical connection means;

a first magnetic flux path mechanically coupled with the orbiting electrical conductor means and intersecting the first armature means;

a first magnetic flux generating means for generating a magnetic flux through said first magnetic flux path;

wherein the orbiting electrical conductor means is movable around the stationary set of electrical conductor means;

wherein movement of the orbiting electrical conductor means around the stationary set of electrical conductor means causes relative movement between said first magnetic flux path and said first armature means; and

wherein when the orbiting electrical conductor means moves around the stationary set of electrical conductor means while the first magnetic flux generating means is generating a magnetic flux through the first magnetic flux path an electrical potential is generated between the second electrically conductive shaft means and the third electrically conductive shaft means.

5,587,619

ROTARY ARMATURE AND METHOD OF FORMING ARMATURE COIL

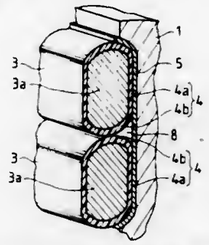
Shigeru Yumiyama, Katsuta; Ko Onodera, Hitachioota, and Yoshimi Mori, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 17, 1993, Ser. No. 168,172

Claims priority, application Japan, Dec. 21, 1992, 4-339954

Int. Cl.[6] H02K *1/04;3/04;17/00*

U.S. Cl. 310—201 **7 Claims**



1. A rotary armature, comprising a shaft supported rotatably at both ends thereof;

a magnetic core fixed by said shaft and forming a plurality of slots at an outer periphery thereof; and

a flat type coil insulated from said magnetic core by an insulating material, said flat type coil being a multi-coil structure in one slot and coated by an insulated coating film; wherein

said flat type coil comprises a first flat type coil and a second flat type coil,

said first flat type coil having a first pair of said insulated coating films oppositely arranged to each other in a rotational direction of the armature and being made thinner than a second pair of insulated coating films which are oppositely arranged to each other in a radial direction of the armature,

said second flat type coil having a third pair of said insulated coating films being oppositely arranged to each other in the rotational direction, and being made thinner than a fourth pair of insulated coating films oppositely arranged to each other in the radial direction,

one of said second pair of said insulated coating films in the radial direction of said first flat type coil being opposed to one of said fourth pair of said insulated coating films in the radial direction of said second flat type coil,

one of said second pair of said insulated coating films in the radial direction of said first flat type coil contacting one of said fourth pair of said insulated coating films in the radial direction of said second flat type coil,

one of said second pair of said insulated coating films in the radial direction of said first flat type coil contacting an insulating sheet, sandwiched between said magnetic core and said second pair of said insulating coating films in the radial direction of said first flat type coil, and

one of said fourth pair of said insulated coating films in the radial direction of said second flat type coil contacting an insulating sheet sandwiched between said magnetic core and said fourth pair of said insulating coating films in the radial direction of said second flat type coil.

5,587,620

TUNABLE THIN FILM ACOUSTIC RESONATORS AND METHOD FOR MAKING THE SAME

Richard C. Ruby, Menlo Park, and Paul P. Merchant, Belmont, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 21, 1993, Ser. No. 171,227

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—346 **25 Claims**

1. A high-Q, acoustical resonator, comprising:

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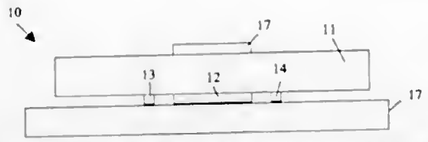


a bottom electrode layer having an ordered structure, a thickness and an acoustical attenuation;

a thin-film PZ layer comprising AlN deposited on said lower electrode layer with an ordered structure imparted thereon by said ordered structure of said lower electrode layer, said PZ layer having a top surface and a thickness; and

a top electrode layer adjacent to said top surface of said PZ layer, the top electrode layer having a thickness and an acoustical attenuation,

wherein:

the top electrode layer, the PZ layer, and the bottom electrode layer collectively consitute an acoustic path having a Q, the top electrode layer and the bottom electrode layer each having a thickness relative to the thickness of the PZ layer such that the top electrode layer and the bottom electrode layer collectively constitute such a proportion of the acoustic path that the top electrode layer and the bottom electrode layer having a high acoustical attenuation causes the acoustic path to have a low Q, and

both of said top electrode layer and said bottom electrode layer consist essentially of at least one metal chosen from the group consisting of Mo and W to minimize the acoustical attenuation of said top electrode layer and said bottom electrode layer, and thereby to maximize the Q of the acoustical resonator.

5,587,621

IMAGE INTENSIFIER TUBE

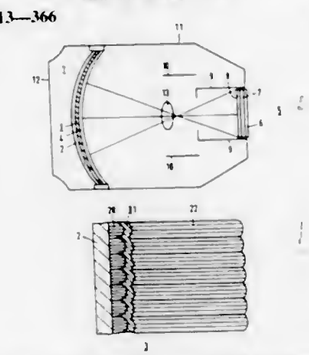
Johannes K. E. Colditz, Heerlen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1995, Ser. No. 385,520

Claims priority, application Belgium, Feb. 9, 1994, 9400152

Int. Cl.[6] H01J *29/45*

U.S. Cl. 313—366 **8 Claims**



1. An image intensifier tube, comprising a conversion screen with a substrate on which there is provided a seed layer which is separated by an intermediate layer from a scintillation layer for converting incident radiation of a first wavelength into radiation of a second wavelength, characterized in that the intermediate layer is reflective for at least a part of radiation of the second wavelength emitted towards the intermediate layer.

5,587,622

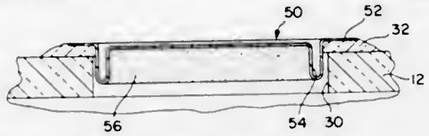
LOW PRESSURE GAS DISCHARGE LAMPS WITH LOW PROFILE SEALING COVER PLATE

Ferenc Mohacsi, Kalamazoo, Mich., assignor to Fallon Luminous Products, Spartanburg, S.C.

Filed Jul. 12, 1994, Ser. No. 273,713

Int. Cl.[6] H01K *3/22;* **H01J** *9/26*

U.S. Cl. 313—493 **5 Claims**



1. A low pressure gas discharge lamp comprising:

at least one flat glass sheet including illumination means, said at least one flat glass sheet having an evacuation port;

a thin cover covering said evacuation port and hermetically secured to said at least one flat glass sheet forming the low pressure gas discharge lamp;

wherein a getter is secured to said thin cover.

5,587,623

FIELD EMITTER STRUCTURE AND METHOD OF MAKING THE SAME

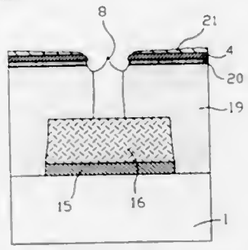
Gary W. Jones, Raleigh, N.C., assignor to FED Corporation, Hopewell Junction, N.Y.

Continuation of Ser. No. 29,880, Mar. 11, 1993, abandoned.

This application Apr. 3, 1996, Ser. No. 627,922

Int. Cl.[6] H01J *19/24*

U.S. Cl. 313—497 **40 Claims**



1. An emitter tip structure for use in a field emission device, comprising:

a substrate;

an emitter tip on the substrate;

a multi-layer electrode structure peripherally overlying and in alignment with the emitter tip, wherein the multi-layer electrode structure comprises:

electrode conductive layer; and

at least three successive insulative layers comprising different insulative materials in successively adjacent insulative layers, between said electrode conductive layer and the substrate, wherein said different insulative material in successively adjacent insulative layers comprises respectively different dielectric constant materials in said successively adjacent insulative layers, for providing current leakage control in said emitter tip structure.

5,587,624

PLASMA DISPLAY PANEL

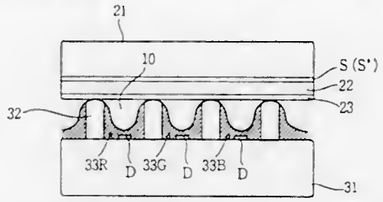
Toshihiro Komaki, Yamanashi-ken, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 14, 1995, Ser. No. 388,470

Claims priority, application Japan, Feb. 23, 1994, 6-025076; Jun. 23, 1994, 6-141775

Int. Cl.[6] H01J *17/49*

U.S. Cl. 313—584 **4 Claims**



1. A plasma display panel comprising:

a pair of substrates, a plurality of sustaining electrodes provided between the substrates and arranged in pairs, a plurality of address electrodes disposed in a perpendicular direction to the sustaining electrodes, thereby forming a matrix defining a plurality of pixels, each pixel being defined by a region bordered by a pair of the sustaining electrodes and two of the address electrodes, wherein:

each of the sustaining electrodes has an area in a central pixel area of the panel that is larger than an area of the sustaining electrodes in a peripheral pixel area of the panel.

5,587,625

GAS DISCHARGE TUBE

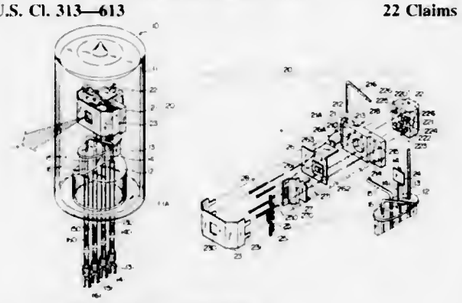
Tomoyuki Ikedo; Yoshinobu Ito, and Ryotaro Matui, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jul. 13, 1995, Ser. No. 502,010

Claims priority, application Japan, Aug. 31, 1994, 6-207712

Int. Cl.[6] H01J *17/02*

U.S. Cl. 313—613 **22 Claims**



1. A gas discharge tube comprising:

an envelope for sealing a gas therein;

a discharge shielding member of an insulator being in said envelope, said discharge shielding member having a front surface and a rear surface which is opposite to said front surface and which is communicated with the front surface by a through hole;

a hot cathode for emitting thermoelectrons, being in said envelope and located at the front surface side of said discharge shielding member;

an anode plate for receiving the thermoelectrons emitted from said hot cathode, being in contact with at least two parts of the rear surface of said discharge shielding member and covering an opening of the through hole at the rear surface side of said discharge shielding member;

a focusing electrode being supported by said discharge shielding member and in contact with the front surface of said discharge shielding member, said focusing electrode having a focusing opening which is located at a position of an opening of the through hole at the front surface side of said discharge shielding member, for converging paths of the thermoelectrons; and

a support member of an insulator being in said envelope and located on an opposite side to said discharge shielding member through said anode plate, said support member having at least two projections for respectively pushing said anode plate onto said parts of the rear surface of said discharge shielding member, whereby at least two parts of said anode plate are gripped by said projections of said support member and the rear surface of said discharge shielding member.

5,587,626

PATTERNED OPTICAL INTERFERENCE COATINGS FOR ONLY A PORTION OF A HIGH INTENSITY LAMP ENVELOPE

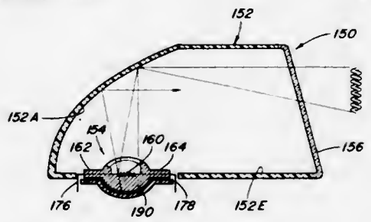
Thomas G. Parham, Gates Mills; Frederick W. Dynys, Chagrin Falls; Carl V. Gunter, Twinsburg; John M. Davenport, Lyndhurst; Thomas M. Golz, Willoughby Hills; Rolf S. Bergman, Cleveland Heights; Frederic F. Ahlgren, Euclid; Gary R. Allen, Chesterland; Mark E. Duffy, Shaker Heights, and Richard L. Hansler, Pepper Pike, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 165,447, Dec. 10, 1993, abandoned.

This application Dec. 27, 1995, Ser. No. 579,447

Int. Cl.[6] H01J *17/16;61/30;* **G02B** *1/10;* **F21M** *3/14*

U.S. Cl. 313—634 **24 Claims**



1. A light source comprising:

means for generating light;

a vitreous light-transmitting envelope having a sealed chamber that receives the light generating means and an external surface, the envelope and light generating means being dimensioned such that the average power density transmitted through the envelope is at least four (4) watts/cm^2; and

a multilayer optical interference coating on only a portion of the external surface of the envelope for reflecting light from the light generating means in a direction that enhances the amount of light transmitted through an uncoated portion of the envelope external surface.

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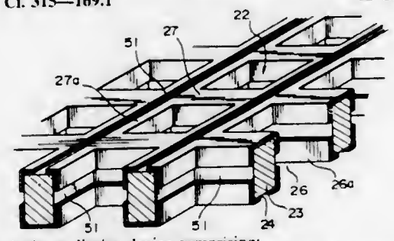
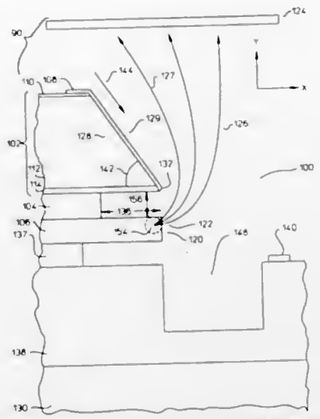
5,587,627
PLANAR DISPLAY APPARATUS HAVING EXPOSED INSULATED SUBSTRATE PORTION
Masato Saito; Ryo Suzuki; Keiji Fukuyama; Takuya Ohira; Keiji Watanabe, all of Kamakura; Minoru Kobayashi; Susumu Hoshinouchi, both of Amagasaki, and Yoshinori Hatanaka, Hamamatsu, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 7,912, Jan. 22, 1993, Pat. No. 5,495,145, which is a continuation of Ser. No. 648,031, Jan. 30, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 395,703
Claims priority, application Japan, Feb. 1, 1990, 2-22768; Feb. 21, 1990, 2-41601
Int. Cl.[6] H05B *37/02*
U.S. Cl. 315—169.1 **12 Claims**



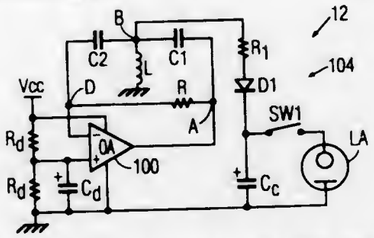
1. A planar display device comprising:
an electron emission source for emitting electrons to a phosphor screen provided on an inside surface of a sealed container;
a surface insulated substrate being composed of a conductive substrate and an insulating layer said surface insulated substrate being provided between the electron emission source and the phosphor screen and provided with a plurality of electron-passing holes;
a control electrode portion including a plurality of conductive films having a passing electron controlling potential applied thereto;
a conductive substrate exposed portion formed on a portion of said surface insulted substrate and composed of a portion of the conductive substrate without the insulating layer; and
a voltage applying circuit applying a predetermined voltage to the conductive substrate exposed portion
wherein each of the plurality of conductive films cover a part of an inside surface of at least one of the plurality of electron passing holes.

5,587,628
FIELD EMITTER WITH A TAPERED GATE FOR FLAT PANEL DISPLAY
Huei-Pei Kuo, 924 Old Town Ct., Cupertino, Calif. 95014
Filed Apr. 21, 1995, Ser. No. 426,357
Int. Cl.[6] G09G *3/00*
U.S. Cl. 315—169.3 **12 Claims**

1. A field emission device in an apparatus with a screen, the device comprising:
a substrate;
an emitter layer, made of resistive material, coupled to the substrate, the layer having a side end that has an edge,
a spacer layer on and over only a portion of the emitter layer to expose the edge; and a gate layer, on the spacer layer, the gate layer having a side end that is tapered to form a wedge with an edge, and including:
a gate dielectric layer; and
a gate conductive layer over the gate dielectric layer to cover at least the side end and the edge of the gate layer;
wherein the screen is at a selected positive voltage and is positioned above the gate layer; such that:
when a selected potential difference is applied between the edge emitter and the gate layer, an electron-extraction field is established between the edge of the wedge and the edge of the emitter layer to extract electrons from the edge of the emitter layer, and the electrons are attracted to the screen;
the resistive nature of the emitter layer enhances the uniformity of the electrons emitted along the edge of the emitter layer; and
the wedge reduces the amount of extracted electrons collected by the gate layer.

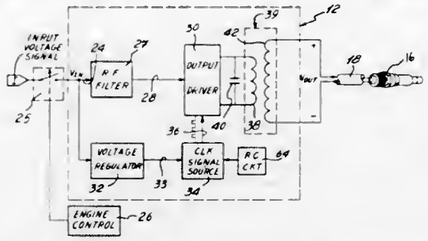


5,587,629
TRANSFORMERLESS HIGH-VOLTAGE GENERATOR CIRCUIT
Viktor L. Gornstein, New York, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y.
Filed Aug. 28, 1995, Ser. No. 519,907
Int. Cl.[6] H05B *37/00*
U.S. Cl. 315—200 R **6 Claims**



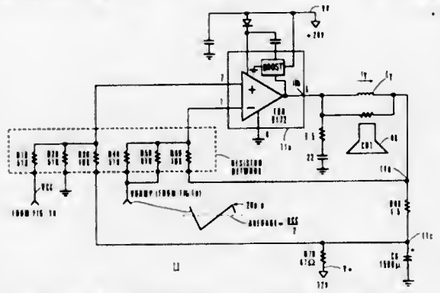
1. A transformerless high-voltage generator circuit, which comprises:
an amplifier having an inverting input terminal, a noninverting input terminal, and an amplifier output terminal, said noninverting terminal being coupled to a common terminal; and
a feedback circuit coupled between said amplifier output terminal and said inverting input terminal for causing said high-voltage generator circuit to oscillate during operation, said feedback circuit comprising:
a first resistor coupled between said amplifier output terminal and said inverting input terminal;
first and second capacitors coupled in series between said amplifier output terminal and said inverting input terminal, said first resistor being coupled in parallel with said first and second capacitors and a common connection between said first and second capacitors forming a high-voltage output terminal for generating a high-voltage output with respect to said common terminal; and
an inductor coupled between said high-voltage output terminal and said common terminal and connected directly to said common terminal.

5,587,630
CONTINUOUS PLASMA IGNITION SYSTEM
Kevin A. Dooley, Georgetown, Canada, assignor to Pratt & Whitney Canada Inc., Longueuil, Canada
Filed Oct. 28, 1993, Ser. No. 144,080
Int. Cl.[6] H05B *37/02*
U.S. Cl. 315—209 T **25 Claims**



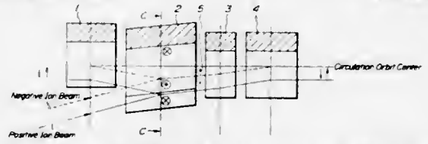
1. A gas turbine ignition system, comprising:
an electrical signal generator to generate an electrical AC signal with a frequency f_1;
an ignitor circuit excited by signals generated by said generator, said ignitor circuit including an ignitor, said ignitor circuit being a resonant circuit having a resonant frequency f_r, such that said ignitor circuit, when excited by said electrical AC signal generated by said generator, generates a plasma of ionized gas and thereafter maintains said plasma of ionized gas when said ignitor circuit continues to be excited with said electrical AC signal.

5,587,631
RESISTOR-MATCHED DEFLECTION APPARATUS FOR A VIDEO DISPLAY
James A. Wilber, Indianapolis, Ind., and Karl R. Koblitz, Meylan, France, assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Continuation of Ser. No. 843,074, Mar. 2, 1992, abandoned. This application Oct. 23, 1992, Ser. No. 965,310
Int. Cl.[6] H01J *29/70;29/76*
U.S. Cl. 315—403 **15 Claims**



1. A video display deflection apparatus, comprising:
a cathode ray tube;
a deflection winding mounted on a neck of said cathode ray tube;
a resistor network;
a source of a sawtooth signal that is developed at a first input terminal of said resistor network having a D.C. component;
a source of a D.C., second signal that is developed at a second input terminal of said resistor network having a level that is different from that of said D.C. component;
a deflection amplifier responsive to said sawtooth and second signals and coupled to said deflection winding to form a D.C. coupled deflection circuit for generating a deflection current in said deflection winding, said sawtooth and second signals being coupled to said amplifier via said resistor network such that a D.C. Thevenin equivalent at a first output terminal of said resistor network of a circuit that includes said source of said sawtooth signal and a first plurality of resistors of said resistor network is identical to a D.C. Thevenin equivalent at a second output terminal of said resistor network of a circuit that includes said source of said second signal and a second plurality of resistors of said resistor network, each resistor of said first and second plurality of resistors having the same value.

5,587,632
INJECTION APPARATUS BOTH FOR POSITIVE AND NEGATIVE IONS
Izumi Sakai, Tsukuba, Japan, assignor to National Laboratory for High Energy Physics, Tsukuba, Japan
Filed Sep. 5, 1995, Ser. No. 523,216
Claims priority, application Japan, Sep. 5, 1994, 6-211261
Int. Cl.[6] H01J *23/00;23/34;* **H05H** *7/00;* **H01F** *7/00*
U.S. Cl. 315—507 **4 Claims**



2. An injection apparatus both for positive and negative ions comprising: a first, a third and a fourth bump magnets arranged in order on a circulation orbit, a second bump magnet arranged on said circulation orbit between the first and the third bump magnets so as to maintain a given position relative to the circulation orbit and a carbon film arranged between the second and the third bump magnets, wherein upon the injection of a negative ion beam, the second bump magnet is affording a function as a bump magnet, after an orbit of the negative ion beam injected at a given angle is deflected in parallel with the circulation orbit through a bump magnet field formed in the second bump magnet, electrons contained in the negative ion beam are separated through the carbon film and converted into a positive ion beam, which gets on the circulation orbit through the third and the fourth bump magnets, wherein upon the injection of a positive ion beam, the second bump magnet is affording a function as a septum magnet, after an orbit of the positive ion beam injected at a given angle is deflected in parallel with the circulation orbit by making the circulation orbit shifted through the first bump magnet to temporarily pass through a septum magnetic field formed in the second bump magnet, the positive ion beam gets on the circulation orbit through the third and the fourth bump magnets.

5,587,633
PRESS CONTROL METHOD AND PRESS APPARATUS
Hideji Aoki; Takahiro Tashima; Suekazu Nakashima; Yoshiyuki Osako, and Hidetaka Yamasaki, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan
Filed Dec. 27, 1995, Ser. No. 578,970
Claims priority, application Japan, Feb. 23, 1995, 7-035368
Int. Cl.[6] B21D *5/02*
U.S. Cl. 318—164 **12 Claims**

7. A press apparatus which converts a driving force of a motor into a thrusting force of a mold through driving force—thrusting force converting means directly connected to said motor to press a processed object, comprising:
torque value detecting means connected to said motor, for detecting a change of a torque value of said motor caused in press processing of said processed object;

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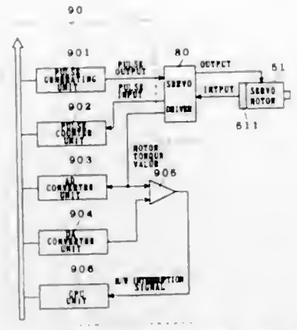


torque value comparing means connected to said torque value detecting means, for making a comparison and determining whether the detected torque value is a previously set predetermined torque value which is smaller than a target rated torque value or not;

drive quantity counting means connected to said motor for counting the quantity of drive of said motor; and

controlling means connected to said torque value comparing means and said drive quantity counting means, for storing deceleration pattern previously set as a function of speed and the quantity of drive and comparing the quantity of drive of said motor outputted from said drive quantity counting means and said deceleration pattern to output speed instructions according to the quantity of drive of said motor so as to decelerate the thrusting speed of said mold, so that after reaching said predetermined torque value, the thrusting speed of said mold attains zero at the time when the quantity of drive of said motor achieves a previously set predetermined quantity of drive.

5,587,634

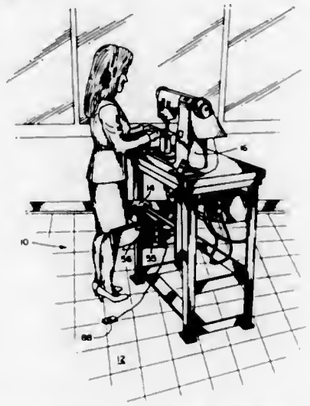
HUMAN BODY ACTUATED CONTROL APPARATUS AND SYSTEM FOR COMMERCIAL SEWING MACHINES

Dhimat R. Desai, South Barrington; Louis C. Tayse, Hinsdale, and Richard W. Gideon, Schaumburg, all of Ill., assignors to ARA Electronics Corp., Elmhurst, Ill.

Filed Nov. 29, 1994, Ser. No. 346,482

Int. Cl.[6] D05B *69/06*

U.S. Cl. 318—257 **56 Claims**



1. An above ground level human body actuated control apparatus for use with an industrial machine by an upright standing operator while both feet are fixed in pressing engagement wit a floor surface, comprising:

(a) an elongated housing;

(b) an elongated control bar having a vertically disposed outer side which extends horizontally, the elongated control bar being sized and configured for horizontally extending across an upright body portion of the operator;

(c) means for pivotally mounting the elongated control bar to the elongated housing for generally horizontal movement of the elongated control bar relative to the elongated housing;

(d) biasing means operatively positioned between the elongated housing and the elongated control bar for urging the elongated control bar in a first direction;

(e) a force sensor operatively positioned between the elongated housing and the elongated control bar; and

(f) sensor actuator means operatively positioned relative to the force sensor for co-action with the force sensor when the upright body portion of the operator pressingly engages the elongated control bar in a second direction.

5,587,635

ROBOT CONTROL APPARATUS FOR MONITORING LOAD ON ROBOT

Atsushi Watanabe, Oshino-mura; Ryo Nihei, and Akihiro Terada, both of Fujiyoshida, all of Japan, assignors to Fanuc Ltd., Japan

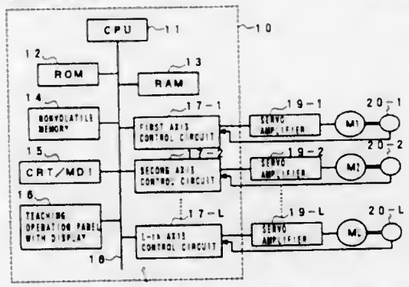
PCT No. PCT/JP94/01582, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO95/09479, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 27, 1994, Ser. No. 446,713

Claims priority, application Japan, Sep. 30, 1993, 5-265526

Int. Cl.[6] H02K *17/32*

U.S. Cl. 318—434 **8 Claims**



1. A robot control apparatus for monitoring a load exerted on a robot comprising:

a motor having an output shaft connected to a driving mechanism of said robot;

speed detection means for detecting a rotational angular speed of said motor;

acceleration calculation means for determining a rotational angular acceleration of said motor based on said rotational angular speed;

driving torque calculation means for calculating a driving torque outputted from said motor output shaft by determining a torque spent inside the motor using said rotational angular speed and said rotational angular acceleration, by determining a torque generated by the motor using a driving current of said motor and by subtracting said torque spent inside the motor from said torque generated by said motor; and

display means for displaying said calculated driving torque.

5,587,636

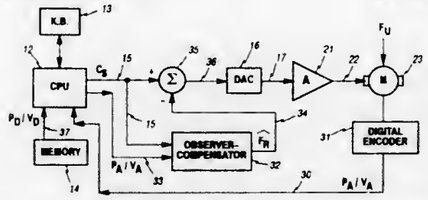
OBSERVER-COMPENSATOR FOR AN ELECTRIC MOTOR SYSTEM

Izhak Bar-Kana, Wynnewood, and Predrag Filipovic, Philadelphia, both of Pa., assignors to Kullcke and Soffa Investments, Inc., Wilmington, Del.

Filed Feb. 24, 1995, Ser. No. 394,381

Int. Cl.[6] G06F *15/46*

U.S. Cl. 318—561 **20 Claims**



1. A method of compensation for unmeasurable disturbance forces in a motor system of the type including a positioning motor to be accurately positioned at high speed in response to positioning command signals generated by a computer controller which is coupled to the motor system, comprising the steps of:

connecting an observer-compensator in a feed forward loop between the output of said computer controller and the input to said motor system,

actuating said motor over a limited range of physical positions in which negligible disturbance forces occur,

adjusting an ideal motor simulator in said observer-compensator during movement of said motor where negligible disturbances forces occur to provide an ideal motor simulator equal to the said motor system,

actuating said motor over a range of physical positions in which high disturbance forces occur,

subtracting the output signal from said ideal motor simulator from a similar output signal from the actual motor system to provide a disturbance force error signal,

coupling said disturbance force error signal to a disturbance force reconstruction device in said compensator-observer,

coupling the output of said disturbance force reconstruction device as a negative input to said actual motor system, and

adjusting said disturbance force reconstruction device until the disturbance force error signal is reduced to a minimum and said disturbance force reconstruction device is made substantially equal to said unmeasurable disturbance forces in said actual motor system.

5,587,637

ROBOT ARM DEVICE CAPABLE OF CONVEYING AN ARTICLE IN CIRCUMFERENTIAL AND RADIAL DIRECTIONS

Keishi Ohyama, Kasaoka, Japan, assignor to Tatsumo Kabushiki Kaisha, Okayama-ken, Japan

Filed Dec. 29, 1994, Ser. No. 365,653

Claims priority, application Japan, Jan. 10, 1994, 6-000864

Int. Cl.[6] B25J *9/18*

U.S. Cl. 318—568.11 **7 Claims**

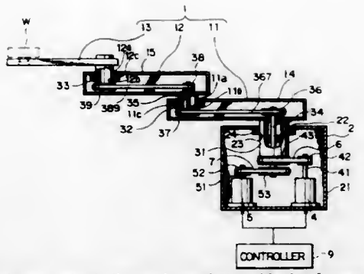
1. A robot arm device comprising:

an expandable arm portion including an arm member, a forearm arm member, and a hand member;

an arm drive wheel fixedly connected at a base end of the arm member;

a transmission mechanism including a transmission wheel disposed coaxially with the arm drive wheel and rotatable independently from the arm drive wheel;

a forearm drive wheel disposed at a leading end of the arm member and rotatable independently from the arm member and fixedly connected at a base end of the forearm member;



a stationary wheel disposed coaxially with the forearm drive wheel and fixedly connected with the arm member;

a hand drive wheel disposed at a leading end of the forearm member, and rotatable independently from the forearm member, and fixedly connected at a base end of the hand member, and having a diameter twice greater than the stationary wheel, and an axis of the hand drive wheel being spaced from an axis of the stationary wheel the same distance as an axis of the forearm drive wheel is spaced from an axis of the arm drive wheel;

an arm drive motor operable to rotate the arm drive wheel;

a forearm drive motor operable to rotate the forearm drive wheel via the transmission mechanism;

a first endless member wound on the transmission wheel and the forearm drive wheel;

a second endless member wound on the stationary wheel and the hand drive wheel; and

a controller operable to control the driving of the arm and forearm drive motors to:

rotate the arm and forearm drive motors in the same direction to thereby rotate the arm portion in a specified circumferential direction; and

rotate the arm drive motor in a specified direction and rotate the forearm drive motor in the opposite direction at such an angular speed as to rotate the forearm drive wheel twice faster than the arm drive wheel via the transmission mechanism and the first endless member in combination with a relative rotation of the forearm drive wheel due to the rotation of the arm member to thereby move the hand member in a straight radial direction.

5,587,638

FLEXIBLE SERVO CONTROL METHOD CAPABLE OF SPECIFYING FLEXIBILITY ON WORKING COORDINATES

Tetsuaki Kato, Hadano; Soichi Arita, and Masaru Nakamura, both of Oshino-mura, all of Japan, assignors to Fanuc Ltd., Minamitsuru-gun, Japan

PCT No. PCT/JP94/01012, § 371 Date Feb. 28, 1995, § 102(e) Date Feb. 28, 1995, PCT Pub. No. WO95/02214, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 23, 1994, Ser. No. 392,790

Claims priority, application Japan, Jul. 5, 1993, 5-191962

Int. Cl.[6] G05B *19/42*

U.S. Cl. 318—568.14 **4 Claims**

1. A flexible servocontrol method of a servomotor which drives a body, the servomotor being controlled by a control system including a position control loop and a speed control loop, the flexible servocontrol method comprising the steps of:

specifying the degrees of flexibility on a working coordinate system of the body;

converting the degrees of flexibility specified on the working coordinate system into servo gains with respect to individual axes of the servo motor; and

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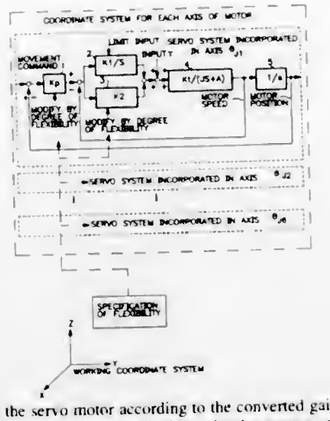


driving the servo motor according to the converted gains so that the body which is normally driven by the servo motor can be moved manually.

5,587,639

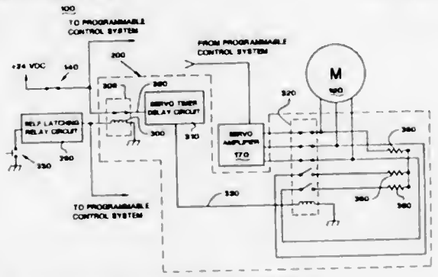
Patent Not Issued For This Number

5,587,640

DELAYED SAFETY BRAKING APPARATUS FOR A SERVOMOTOR CONTROL SYSTEM

Anders Ek, Chicago, and Johan Hegardt, Buffalo Grove, both of Ill., assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Sep. 28, 1994, Ser. No. 315,407
Int. Cl.[6] G05B *1/06*
U.S. Cl. 318—638 **15 Claims**



4. A servomotor control system comprising:

a programmable control system;

a servo amplifier connected for control by the programmable control system to effect a predetermined motion profile;

a servomotor connected for control by the servo amplifier;

a safety switch connected for detection by the programmable control system, the programmable control system controlling the servo amplifier to brake the servomotor upon detection of activation of the safety switch; and

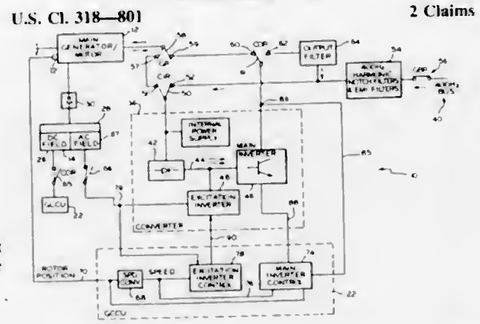
a delayed braking circuit disposed between the servo amplifier and the servomotor, the delayed braking circuit connected to detect activation of the safety switch, the delayed braking circuit acting to brake the servomotor upon failure of the programmable control system and the servo amplifier to brake the servomotor within a predetermined period of time after actuation of the safety switch.

5,587,641

VSCF START SYSTEM WITH PRECISE VOLTAGE CONTROL

Gregory I. Rozman, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 279,863, Dec. 5, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 504,102
Int. Cl.[6] H02P *7/00*
U.S. Cl. 318—801 **2 Claims**



1. A control system for a brushless machine having a rotor and a stator having a stator coil which is controllably energized from a source of DC power defining a positive and a negative DC voltage for imparting rotation to the rotor, comprising:

switching means coupled between the source of DC power and said stator coil for alternately applying the positive and negative voltage to said coil, said switching means defining an output voltage;

first means for generating an output voltage command;

second means for generating a commutation angle command;

first sensing means for sensing the speed of rotational movement of the rotor;

second sensing means for sending current through the stator coil;

means coupled to said second generating means and said first and second sensing means for developing an estimate of stator coil voltage responsive to said commutation angle command, said rotor speed and said stator current, said developing means including means for determining said stator coil voltage in accordance with the following equation:

$$V_T = I_A \cdot R_r + \frac{I_A \cdot K_1 \cdot \omega \cdot L_q}{tg(\alpha)},$$

where:

I_A—stator coil current;

α—commutation angle command;

R_r—a constant representing stator coil resistance;

$$K_1 = \text{no. of motor Poles} \frac{\pi}{60} \text{ (a constant)};$$

ω—motor speed, rpm; and

L_q—a constant representing motor quadrature axis synchronous inductance; and

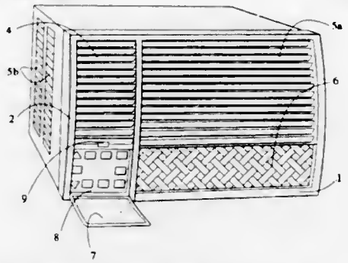
control means coupled to said first and second generating means and said developing means for controlling said switching means so that said switching means develop an output voltage in accordance with said output voltage command, said commutation angle command and said voltage estimate.

5,587,642

FAN MOTOR BROWN-OUT CONTROL ALGORITHM

Larry J. Manson, Baroda; Chris A. Scriber, Holland, both of Mich., and William L. Davis, Murfreesboro, Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 7, 1995, Ser. No. 418,621
Int. Cl.[6] H02P *7/622*
U.S. Cl. 318—812 **13 Claims**



1. An air conditioner, comprising:

a power supply connected to an AC line voltage;

a fan motor;

a multispeed fan driven by the fan motor, the multispeed fan having at least a first speed, a second speed and a third speed of discrete increasing values;

means for selecting one of the first, second or third speeds of the fan to obtain a selected speed of the fan;

means for sensing a brown-out condition of the AC line voltage and for providing a signal indicative of the brown-out condition, the sensing means being connected to the power supply; and

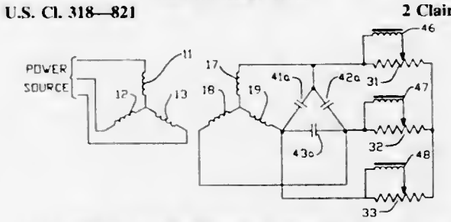
means for increasing the speed of the fan from the selected speed to the next higher speed Value in response to the sensed brown-out condition signal provided by the sensing means.

5,587,643

ROTARY INDUCTION MACHINE HAVING CONTROL OF SECONDARY WINDING IMPEDANCE

Samuel Heller, Westchester County, N.Y., assignor to Heller DeJulio Corporation, Danville, Calif.

Continuation of Ser. No. 789,993, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 489,894, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 218,575, Jul. 12, 1988, abandoned. This application Mar. 22, 1994, Ser. No. 216,090
Int. Cl.[6] H02P *13/00*
U.S. Cl. 318—821 **2 Claims**



1. A rotary induction generator comprising a stator having wound thereon stator windings defining a three-phase stator;

a rotor mounted for rotation in said stator and having wound thereon three rotor winding defining a three-phase rotor;

said three-phase stator windings adapted to be connected to a source of electrical power and serving as primary windings whereby the applied power causes current to flow in said three-phase windings and provide a rotating magnetic field;

said other three-phase windings serving as a secondary winding coupled to said magnetic field whereby currents are induced in said secondary windings which in turn induce power in said primary windings in response to rotation of the rotor;

capacitive means connected directly across each of said secondary windings having a value sufficient to increase the efficiency of said machine; and

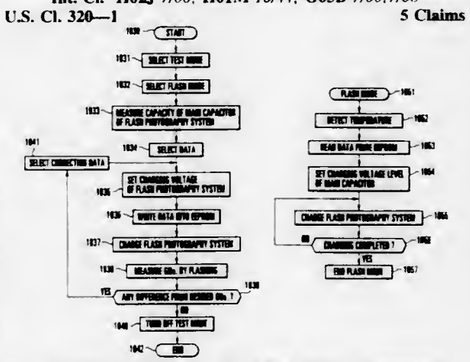
resistive means connected in series with said secondary windings to control the power output for different rotor speeds.

5,587,644

CHARGING CONTROL DEVICE FOR FLASH DEVICE

Junya Masaki, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1995, Ser. No. 490,000
Claims priority, application Japan, Jun. 15, 1994, 6-133265
Int. Cl.[6] H02J *7/00;* **H01M** *10/44;* **G03B** *7/00;7/08*
U.S. Cl. 320—1 **5 Claims**



1. A charging control device for a flash device, comprising:

a) temperature detecting means for detecting a temperature condition; and

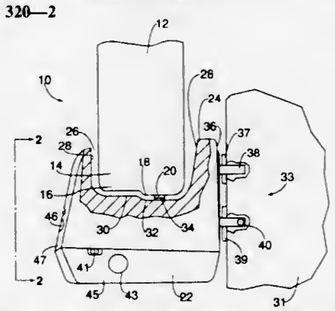
b) charging regulating means for regulating a charging action on a main capacitor of the flash device on the basis of the temperature condition detected by said temperature detecting means, said charging regulating means including memory means for storing charging action data corresponding to diverse temperatures.

5,587,645

BATTERY CHARGER WITH NIGHT LIGHT FOR A CORDLESS TELEPHONE

Eduardo Sciammarella, Hoboken, and Michael Lang, Ridgewood, both of N.J., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Mar. 9, 1994, Ser. No. 208,540
Int. Cl.[6] H02T *7/00*
U.S. Cl. 320—2 **3 Claims**



1. A battery charger, wherein said battery charger is energized by a power supply and said power supply is accessible through an electrical outlet having upper and lower receptacle pairs, comprising:

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a housing having an aperture for receiving a cordless telephone handset having rechargeable batteries and handset contacts electrically connected to said batteries, wherein said housing includes charger contacts for forming an electrical connection with said handset contacts;

upper and lower prongs extending from said housing, said upper and lower prongs being adapted to be inserted into said upper and lower receptacle pairs, respectively, for removably securing said housing to said electrical outlet when said handset is positioned within said aperture;

said housing including:

charging means for charging said batteries, said charging means being electrically connected to said charger contacts and including an indicator disposed on said housing for indicating that said battery is being charged; a phototransistor for detecting whether a level of light impinging on said housing is below a predetermined level;

a lamp disposed on said housing for providing illumination adjacent said housing;

first circuit means for supplying electrical power from said power supply to energize said charging means, said light sensing means and said lamp;

second circuit means for supplying electrical power from said battery to energize said lamp when said power supply is disconnected from said battery charger and when said light detection means detects a level of light below said predetermined level, and

a switch for turning said lamp on or off.

5,587,646

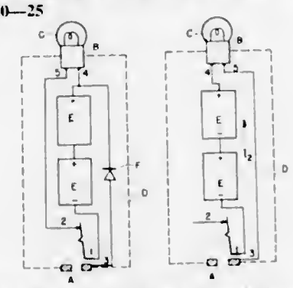
RECHARGEABLE TABLE LIGHTING SYSTEM WITH PROTECTION FROM SHORT CIRCUITS

Mark S. Thomas, 5058 Dunsmuir Common, Fremont, Calif. 94555

Filed Sep. 23, 1994, Ser. No. 311,269

Int. Cl.[6] F21L *7/00;* **H02J** *7/00*

U.S. Cl. 320—25 **5 Claims**



1. A battery operated table lighting fixture including:

a housing having an upper and a lower end, said housing containing a rechargeable battery;

a lamp extending from the upper end of the housing;

a 3-element, normally closed phono jack in the lower end of said housing opposite said lamp, said phono jack having an electrically conductive body element, a resilient conductive tip element and a conductive third element normally in contact with said conductive tip element;

first series circuitry including said battery, said lamp, said conductive tip element and said conductive third element for energizing said lamp from said battery; and

second series circuitry including said electrically conductive body of said jack, said battery, and said conductive tip element, said first series circuit being opened upon the insertion of a phono plug from a battery charger into said jack;

the improvement comprising a diode in said second series circuitry between said conductive body of said jack and said battery, the cathode end of said diode being attached to a positive terminal of said battery for preventing rapid discharge of said battery by the insertion into said jack of a phono plug with short circuited body and tip contacts.

5,587,647

DUAL OUTPUT SYNCHRONOUS-INDUCTION STARTING/GENERATING SYSTEM

Madan L. Bansal, and Jayant G. Vaidya, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 30, 1995, Ser. No. 497,036

Int. Cl.[6] H02P *9/00*

U.S. Cl. 322—45 **13 Claims**

1. An electric power starter generator system, comprising:

a synchronous generator having a first rotor and a first polyphase stator output coupled to an ac bus;

an induction motor/generator having a second rotor and a second polyphase stator output;

a shaft coupled to said first rotor of said synchronous generator and to said second rotor of said induction motor/generator, said shaft being drivably coupled to an external prime mover, said shaft driving said synchronous generator and said induction motor/generator at a same speed thereby; and

a rectifier/inverter having ac terminals coupled to said second polyphase stator output and dc terminals coupled to a dc bus, said rectifier/inverter allowing bi-directional power flow therethrough.

5,587,648

POWER SUPPLY CIRCUIT FOR GENERATING AN INTERNAL POWER SUPPLY POTENTIAL BASED ON AN EXTERNAL POTENTIAL

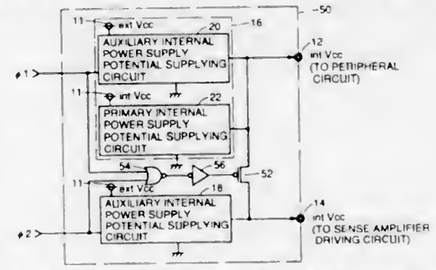
Shinichi Jinbo, and Shigeru Mori, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 378,217

Claims priority, application Japan, Jan. 31, 1994, 6-009136

Int. Cl.[6] G05F *1/613*

U.S. Cl. 323—269 **14 Claims**



1. An internal power supply circuit generating an internal power supply potential based on an external power supply potential, comprising:

a first output node;

a second output node;

primary internal power supply potential supplying means for supplying said internal power supply potential to said first output node based on said external power supply potential;

first auxiliary internal power supply potential supplying means for selectively supplying said internal power supply potential to said first output node based on said external power supply potential;

second auxiliary internal power supply potential supplying means for supplying, when said first auxiliary internal power supply potential supplying means supplies said internal power supply potential, said internal power supply potential to said second output node based on said external power supply potential; and

switching means connected between said first and second output nodes for being rendered non-conductive when said first and second auxiliary internal power supply potential supplying means supply said internal power supply potential, respectively.

5,587,649

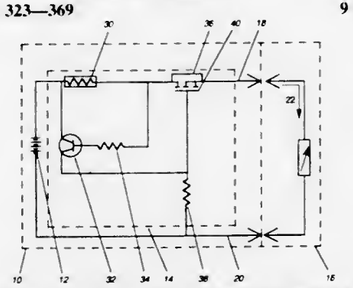
THERMAL PERFORMANCE MATCHED CURRENT LIMITING CIRCUIT, AND BATTERY USING SAME

Scott M. Garrett, Lawrenceville, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1994, Ser. No. 316,678

Int. Cl.[6] G05F *1/573*

U.S. Cl. 323—369 **9 Claims**



1. A battery pack for powering an electronic device having a maximum current demand, in a volatile atmosphere, said battery pack comprising:

at least one battery cell;

current limiting means establishing a current level limit responsive to temperature such that a change of said current level limit over a temperature range matches the maximum current demand of said device over said temperature range, said current limiting means comprising:

a sense resistance means responsive to temperature and characterized by an effective resistance magnitude which has a negative temperature coefficient, said sense resistance means being electrically connected in series between said at least one cell and at least one of said electrical contacts;

a pass transistor having at least three terminals, the first and second of which are electrically connected in series between said sense resistance means and one of said electrical contacts;

a bias resistor for supplying bias to said pass transistor, said bias resistor being electrically connected between said third terminal of said pass transistor means and a voltage potential; and

a bipolar transistor, having a base, emitter, and collector, forming a base-emitter junction, electrically connected such that said collector is electrically connected to said third terminal of said pass transistor means; and

a pair of electrical contacts for electrically coupling said battery pack to said device.

5,587,650

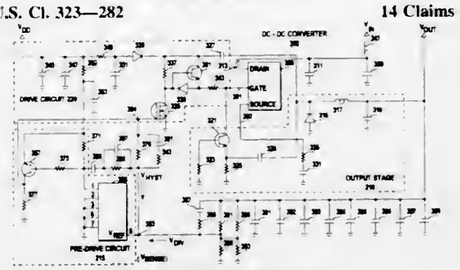
HIGH PRECISION SWITCHING REGULATOR CIRCUIT

Harold L. Massie, West Linn, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 13, 1994, Ser. No. 355,027

Int. Cl.[6] G05F *1/575*

U.S. Cl. 323—282 **14 Claims**



1. A switching regulator circuit comprising:

a primary feedback loop comprising a drive circuit, a switching transistor, an output stage, and a pre-drive circuit coupled in series, the pre-drive circuit further being coupled to the drive circuit, the primary feedback loop using negative feedback to output a predetermined output voltage at the output stage; and

a feedback circuit coupled between an input and an output of the pre-drive circuit, the feedback using regenerative feedback to provide hysteresis which causes the primary feedback loop to oscillate.

5,587,651

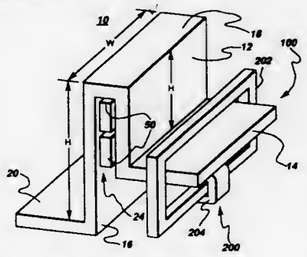
ALTERNATING CURRENT SENSOR BASED ON PARALLEL-PLATE GEOMETRY AND HAVING A CONDUCTOR FOR PROVIDING SEPARATE SELF-POWERING

Ertugrul Berkcan, Schenectady, N.Y., and Raymond K. Seymour, Plainville, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,503

Int. Cl.[6] G01R *1/04;33/00*

U.S. Cl. 324—127 **21 Claims**



1. An alternating current sensor comprising:

a first conductor plate;

a second conductor plate positioned in spaced relationship relative to said first conductor plate and substantially facing said first conductor plate;

a third conductor plate for electrically interconnecting said first and second conductor plates to form a connected electrically conductive path along said first and second conductor plates;

said first and second conductor plates shaped to form respective magnetic field constituents substantially around each of said first and second conductor plates during current flow along the conductive path;

sensing means for sensing changes in magnetic flux resulting from changes in said respective magnetic field constituents;

a magnetic core situated about said conductive path; and

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conductor means electrically interconnected with said first, second and third conductor plates for carrying substantially all current which flows along the conductive path and for producing a magnetic field through said magnetic core, said sensing means being spaced apart from said magnetic core.

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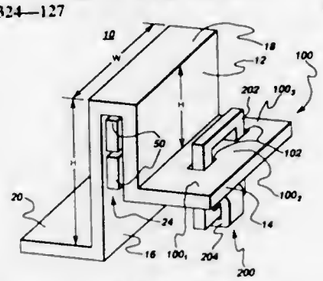
ALTERNATING CURRENT SENSOR BASED ON PARALLEL-PLATE GEOMETRY AND HAVING A SHUNT FOR SELF-POWERING

Ertugrul Berkcan, Schenectady, N.Y.; Raymond K. Seymour, Plainville, Conn., and John C. Grzelecki, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,505
Int. Cl.[6] G01R *1/04;33/00*
U.S. Cl. 324—127 **22 Claims**



1. An alternating current sensor comprising:

a first conductor plate;

a second conductor plate positioned in spaced relationship relative to said first conductor plate and substantially facing said first conductor plate;

a third conductor plate for electrically interconnecting said first and second conductor plates to form a connected conductive path along said first and second conductor plates;

conductive means joined to said first conductor plate for providing at least one of a plurality of parallel branches for said conductive path, said at least one of said parallel branches comprising shunt means for diverting a predetermined portion of current which flows along the conductive path to produce a magnetic field about said at least one branch of said conductive path;

said first and second conductor plates shaped to form respective magnetic field constituents substantially around each of said first and second conductor plates during current flow along the conductive path;

sensing means for sensing changes in magnetic flux resulting from changes in said magnetic field constituents; and

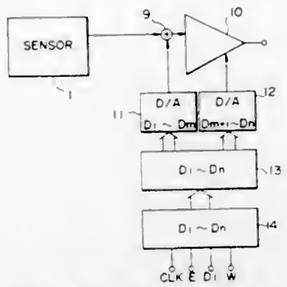
a magnetic core situated about said at least one branch of said conductive path, said magnetic core being spaced apart from said sensing means.

5,587,653

SENSOR CHARACTERISTIC ADJUSTMENT CIRCUIT FOR ADJUSTING OUTPUT CHARACTERISTICS OF A SEMICONDUCTOR SENSOR

Tohru Araki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1993, Ser. No. 172,192
Claims priority, application Japan, Dec. 28, 1992, 4-349167
Int. Cl.[6] G01R *15/00*
U.S. Cl. 324—132 **13 Claims**



1. A sensor characteristic adjustment circuit for adjusting the output characteristic of a sensor comprising:

data conversion means for converting serial data bits corresponding to an adjustment characteristic into parallel data bits, the serial data bits including first bits corresponding to an offset of said sensor characteristic adjustment circuit and second bits corresponding to a sensitivity of said sensor characteristic adjustment circuit, said data conversion means converting the first serial data bits into first parallel data bits and the second serial data bits into second parallel data bits;

non-volatile memory means coupled to said data conversion means and having memory cells for storing parallel data bits output from said data conversion means;

first adjustment means coupled to said non-volatile memory means and the sensor for setting the offset of said sensor characteristic adjustment circuit in accordance with the first parallel data bits, said first adjustment means comprising a first digital-to-analog converter coupled to said non-volatile memory means for effecting digital-to-analog conversion of the first parallel data bits, and a summing circuit coupled to the sensor and said first digital-to-analog converter for adding an output of said first digital-to-analog converter to an output of the sensor;

second adjustment means coupled to said non-volatile memory means and the sensor for setting the sensitivity of said sensor characteristic adjustment circuit in accordance with the second parallel data bits, said second adjustment means comprising a second digital-to-analog converter coupled to said non-volatile memory means for effecting digital to analog conversion of the second parallel data bits, and an amplifier circuit coupled to said summing circuit;

first buffer means connected between said non-volatile memory means and said first and second digital-to-analog converters; and

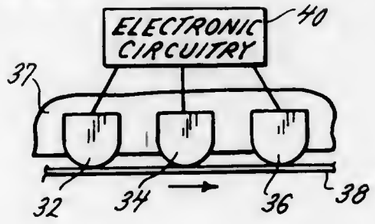
second buffer means connected between said data conversion means and said first and second digital-to-analog converters.

5,587,654

METHOD AND APPARATUS FOR NOISE REDUCTION IN MAGNETIC MEDIA RECORDINGS

Ronald S. Indeck, Olivette, and Marcel W. Muller, St. Louis, both of Mo., assignors to Washington University, St. Louis, Mo.

Filed Apr. 9, 1993, Ser. No. 46,071
Int. Cl.[6] G01R *33/12;* **G01N** *27/72;* **G11B** *5/02;27/34*
U.S. Cl. 324—225 **13 Claims**



13. A device for compensating a signal read from a magnetic medium for the remanent noise of said magnetic medium, said device including:

means for reading said signal from said magnetic medium with a first recording transducer;

means for saturating said magnetic medium with a second recording transducer, said second recording transducer being aligned with and closely spaced behind said first recording transducer to thereby saturate said magnetic medium after only a short time delay from reading;

means for reading said saturated magnetic medium with a third recording transducer to thereby continuously determine the remanent noise thereof, said third recording transducer being aligned with and closely spaced behind said first recording transducer to thereby determine said remanent noise after only a short time delay from saturating; and

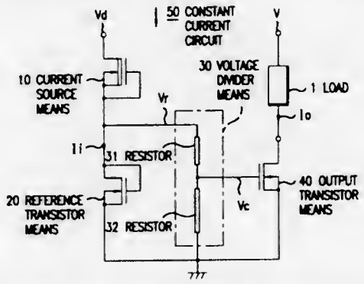
means for continuously compensating said read signal with said remanent noise signal as both said signals are generated to thereby continuously produce a compensated signal in real time.

5,587,655

CONSTANT CURRENT CIRCUIT

Kazunori Oyabe; Kazuhiko Yoshida, and Tatsuhiko Fujihira, all of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 11, 1995, Ser. No. 514,208
Claims priority, application Japan, Aug. 22, 1994, 6-196420
Int. Cl.[6] G05F *3/04;3/16*
U.S. Cl. 323—312 **11 Claims**



1. A constant current circuit for supplying a constant current to a load comprising:

current source means for providing an input current, said input current having a predetermined value with temperature dependence;

reference transistor means having a connection point with the current source means, said reference transistor means receiving said input current and generating a reference voltage at the connection point;

voltage divider means connected to the connection point, said voltage divider means dividing said reference voltage to thereby generate a control voltage; and

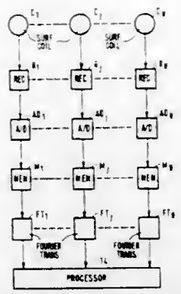
output transistor means connected to the voltage divider means and the load for controlling an output current supplied to the load in response to said control voltage, temperature dependence of said output current being adjusted by setting voltage dividing ratio of said voltage divider means.

5,587,656

MAGNETIC RESONANCE IMAGING METHOD AND APPARATUS

Teunis R. Van Heels-Bergen, and Miha Fuderer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,491
Claims priority, application European Pat. Off., Apr. 8, 1994, 94200959
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—307 **21 Claims**



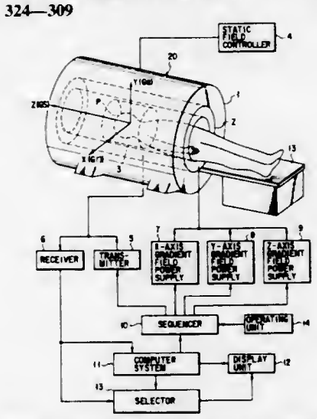
1. A method of determining a magnetic resonance (MR) distribution in a part of a body using an arrangement of multiple surface coils, comprising determining separate component distributions from magnetic resonance signals obtained by means of separate ones of said surface coils, combining said component distributions to form a distribution I_{hom} which is optimized with respect to homogeneity and a distribution I_{SNR} which is optimized with respect to signal-to-noise ratio, and combining said distributions I_{hom} and I_{SNR} to form said MR distribution.

5,587,657

MAGNETIC RESONANCE IMAGING APPARATUS

Hitoshi Kanazawa, Tochigi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 187,603
Claims priority, application Japan, Jan. 26, 1993, 5-010589
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—309 **18 Claims**



1. A magnetic resonance imaging apparatus comprising:

static magnetic field applying means for applying a static magnetic field to an imaging region;

gradient magnetic field applying means for applying to said imaging region gradient magnetic field pulses along a phase encoding direction orthogonal to the direction of said static magnetic field;

transmitter/receiver means for transmitting an excitation pulse to a phantom placed within said imaging region and having a non-magnetic material that contains candidate nuclear species for magnetic resonance and has a periodic structure along the phase encoding direction and for receiving echo signals from said non-magnetic material, said echo signals being output as echo data;

sequence control means for controlling said gradient magnetic field applying means and said transmitter/receiver means in accordance with a predetermined sequence so as to generate a plurality of echo signals of varying echo times each time at each excitation pulse while varying the strength of said gradient magnetic field pulses so that varying phase encoding

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amounts are applied to said echo signals and to acquire echo data required to reconstruct an MR image in split scans on the Fourier space;

display means for displaying the distribution of said echo data output from said transmitter/receiver means on the Fourier space; and

input means for adjusting a reference strength of said gradient magnetic field pulse in said gradient magnetic field pulse applying means so that echo data corresponding to spatial frequencies in said phase encoding direction which are the inverse and an integral multiple of a predetermined period of the periodic structure of said non-magnetic material in said phantom becomes maximum.

5,587,658

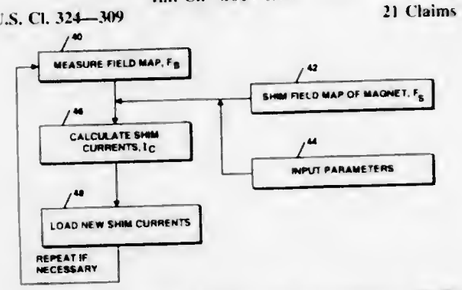
SHIMMING METHOD FOR NMR MAGNET USING UNSHIELDED GRADIENT SYSTEMS

Subramaniam Sukumar, Union City, Calif., assignor to Bruker Instruments, Inc., Billerica, Mass.

Filed Aug. 25, 1995, Ser. No. 519,290

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—309 **21 Claims**



1. A method of detecting a nuclear magnetic resonance (NMR) signal from each of a plurality of spatial points in a sample along a first direction, the method comprising the steps of:

A) locating the sample in a static magnetic field and applying a gradient magnetic field to the sample in the first direction;

B) applying a first radio frequency (RF) pulse to the sample;

C) detecting, after a predetermined duration of time t_1 following application of the first RF pulse, an NMR signal from the sample;

D) changing the magnitude of the gradient magnetic field at a rate which is sufficiently gradual that any eddy current induced in surrounding conductive materials as a result of the changing gradient magnetic field is small enough that any corresponding magnetic field generated by the eddy current is below a desired homogeneity of the static magnetic field;

E) applying a second RF pulse to the sample; and

F) detecting, after a duration equal to t_1 following application of the second RF pulse, an NMR signal from the sample.

5,587,659

TOWABLE ARRAY FOR MEASURING THE RESISTIVITY OF A TERRAIN UTILIZING A LOW POWER LEVEL

Kurt I. Sørensen, Blegindvej 102, DK-8362 Hørning, Denmark

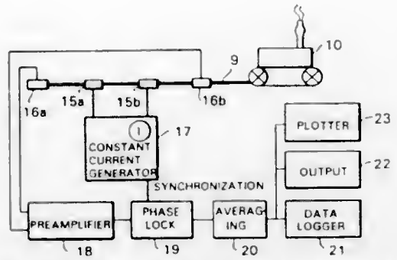
PCT No. PCT/DK92/00023, § 371 Date Oct. 27, 1993, § 102(e) Date Oct. 27, 1993, PCT Pub. No. WO92/13286, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 23, 1992, Ser. No. 90,137

Claims priority, application Denmark, Jan. 24, 1991, 0122/91

Int. Cl.[6] G01V *3/06;3/165;3/15*

U.S. Cl. 324—357 **18 Claims**



1. In an apparatus for mapping the subsurface geology in an earth formation by means of an electrical profiling operation, wherein the apparatus comprises at least one current circuit for passing current from a current source via current electrodes through a surface layer to be examined, and at least one voltage circuit with a measuring instrument for measuring via voltage electrodes a voltage signal generated by the current across the voltage electrodes, the improvement comprising:

a) a plurality of mobile current electrodes and a plurality of mobile voltage electrodes for dragging across the earth formation, each of said current and voltage electrodes having a generally smooth earth engaging surface;

b) means for mounting the current and voltage electrodes on a tow in a set configuration whereby the current and voltage electrodes can be towed in the set configuration from one place to another during the profiling operation; said means for mounting comprising respective wires running generally along the tow for connecting each of said current and voltage electrodes to the measuring instrument, each of said voltage electrodes having a single-ended electrode amplifier therein for simplifying the voltage signal so as to reduce interference between the voltage signal and other signals or current in the respective wires;

c) a generator for generating a train of current pulses;

d) filter means in the voltage circuit for isolating the voltage signal in phase with the current pulses whereby the measuring instrument can distinguish the voltage signal from noise signals.

5,587,660

PROCESS FOR EVALUATING THE REMAINING CHARGE IN AN ACCUMULATOR BATTERY

Philippe Chabbert, Rueil Malmaison; Alain Chatenay, Marly le Roi, and Dominique Menx, Toulouse, all of France, assignors to Thomson-CSF, Paris, France

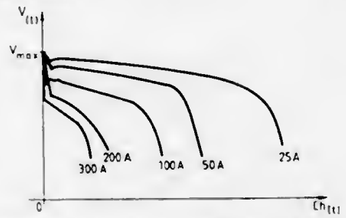
PCT No. PCT/FR94/00934, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO95/04938, PCT Pub. Date Feb. 16, 1995

PCT Filed Jul. 26, 1994, Ser. No. 411,697

Claims priority, application France, Aug. 6, 1993, 93 09713

Int. Cl.[6] G01N *27/42*

U.S. Cl. 324—426 **4 Claims**



1. Process for evaluating the remaining charge in an accumulator battery, according to which the residual charge at the start of discharge is determined and the quantities of electricity extracted as and when the battery is used are added up, wherein account is taken of the quantities of charge which is not restorable instantaneously under the influence of the discharge rate and of the charge which is restorable by reducing the intensity of the current drawn from the battery.

5,587,661

DEVICE FOR INDICATING ERRORS IN A CONTROL LINE OF AN ELECTRIC CONTROL UNITS

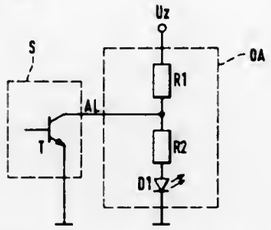
Thomas Schneider, Markgroeningen; Stefan Grieser-Schmitz, Mainz, and Michael Walther, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 14, 1994, Ser. No. 355,747

Claims priority, application Germany, Dec. 14, 1993, 43 42 586.0

Int. Cl.[6] G01R *31/02;* **G08B** *19/00*

U.S. Cl. 324—556 **8 Claims**



1. An indicating device for an electric control unit having a control line, the indicating device comprising:

at least two resistors connected in series and defining a junction point therebetween, the control line being connected to the junction point; and

means, connected in series with the at least two resistors and coupled between a supply voltage and a ground, for indicating a break in the control line upon the occurrence of the break and for indicating a short-circuit between the control line and the supply voltage upon the occurrence of the short-circuit.

5,587,662

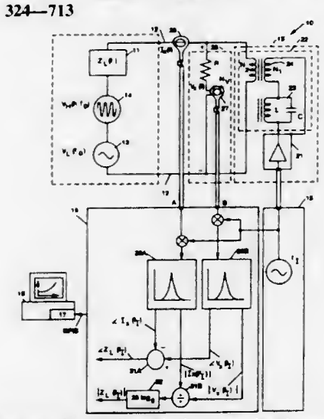
METHOD AND APPARATUS FOR NONDISRUPTIVELY MEASURING LINE IMPEDANCE AT FREQUENCIES WHICH ARE RELATIVELY CLOSE TO THE LINE FREQUENCY

Arthur W. Kelley, and Matthew B. Harris, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Feb. 10, 1995, Ser. No. 386,702

Int. Cl.[6] G01R *27/08*

U.S. Cl. 324—713 **19 Claims**



1. Apparatus for nondisruptively measuring impedance of an energized electrical power line which carries electrical current at a predetermined line frequency, comprising:

means for generating a measurement current at a measurement frequency which is less than fifty times the predetermined line frequency;

means for coupling said generating means to the energized electrical power line, said coupling means including isolating means for only blocking the predetermined line frequency and frequencies which differ from the predetermined line frequency by substantially less than the predetermined line frequency;

current sensing means, electrically coupled to the energized electrical power line, for measuring a line current in said energized electrical power line at the measurement frequency;

voltage sensing means, electrically coupled to the energized electrical power line, for measuring a line voltage in the energized electrical power line at the measurement frequency; and

analyzing means, responsive to said current sensing means and said voltage sensing means, for determining a magnitude and a phase angle of impedance of the energized electrical power line at the measurement frequency, from the line current and the line voltage.

5,587,663

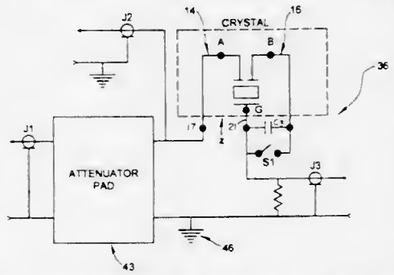
METHOD FOR MEASURING THE INDUCTANCE OF EACH RESONATOR OF A COUPLED-DUAL RESONATOR CRYSTAL

Gerald E. Roberts, and Michael E. Roberts, both of Lynchburg, Va., assignors to XTAL Technologies, Ltd., Carle Place, N.Y.

Continuation-in-part of Ser. No. 370,495, Jan. 9, 1995. This application Mar. 20, 1995, Ser. No. 407,078

Int. Cl.[6] G01R *29/22*

U.S. Cl. 324—727 **23 Claims**



1. A method of determining resonator inductances of a coupled-dual resonator crystal connected to a test fixture, the crystal having a piezoelectric plate, a first electrode on the plate, a common electrode on the plate, a second electrode on the plate, wherein the connection of the first electrode and the common electrode form a first resonator and the connection of the second electrode and the common electrode form a second resonator, the method comprising:

inserting the crystal in the test fixture in a first position;

connecting a frequency synthesizer to the first electrode and to a reference point;

applying a plurality of frequencies to the first electrode;

monitoring a phase response of the crystal with respect to frequency;

monitoring a time response of the crystal with respect to frequency;

determining time delay relative maxima from the time response;

determining a first set of critical frequencies corresponding to the time delay relative maxima;

measuring equivalent static capacitances of the first and second resonator; and

calculating the inductance of the first resonator using the first set of critical frequencies, whereby the resonator inductances are accurately determined for low and high frequency filters at any step in a crystal manufacturing process.

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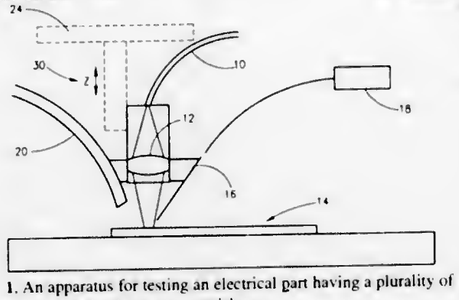
5,587,664

LASER-INDUCED METALLIC PLASMA FOR NON-CONTACT INSPECTION

David Banitt, Soreq, and Moshe B. Shlomo, Maccabim, both of Israel, assignors to Exsight Ltd., Soreq, Israel

Filed Jul. 12, 1995, Ser. No. 501,685
Int. Cl.[6] G01R *31/302*
U.S. Cl. 324—752 18 Claims



1. An apparatus for testing an electrical part having a plurality of conductive paths thereon, comprising:

(a) means for directing a laser pulse to impinge upon a conductor of the part under test so as to form a metallic plasma;

(b) at least one pair of probes which, along with said conductor and said plasma, form a part of an electrical circuit; and

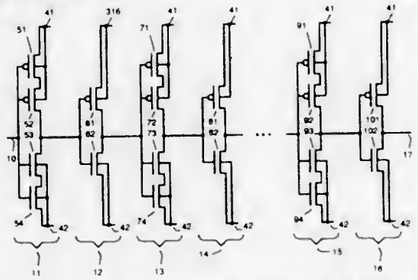
(c) detector means responsive to the amount of conduction via said plasma between said conductor and said probes.

5,587,665

TESTING HOT CARRIER INDUCED DEGRADATION TO FALL AND RISE TIME OF CMOS INVERTER CIRCUITS

Chun Jiang, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 18, 1995, Ser. No. 503,760
Int. Cl.[6] H03K *19/00; 19/0948*
U.S. Cl. 326—16 10 Claims



6. A method for determining performance degradation of an inverter resulting from hot carrier stress, the method comprising the following steps:

(a) forming a string of inverters on an integrated circuit, the string of inverters being connected in series, comprising the following substep

(a.1) constructing every other inverter in the string of inverters using cascaded transistors so that performance of these every other inverters will not be degraded by hot carrier stress introduced in step (d);

(b) measuring propagation delay through the string of inverters of a transition from a first logic state to a second logic state;

(c) after step (b), introducing sufficient hot carrier stress to the string of inverters so that inverters not constructed using cascaded transistors will have degraded performance;

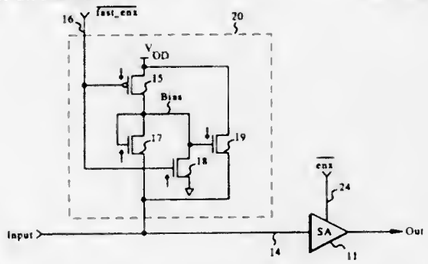
(d) after step (c), measuring propagation delay through the string of inverters of the transition from the first logic state to the second logic state.

5,587,666

SENSE AMPLIFIER SLEW CIRCUITRY

Mark E. Burchfield, Austin, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Filed Apr. 26, 1995, Ser. No. 428,983
Int. Cl.[6] H03K *19/017*
U.S. Cl. 326—17 13 Claims



1. Slew rate circuitry for a sense amplifier comprising:

(a) a pre-charge load device coupled between a positive voltage rail and an input on the sense amplifier; and,

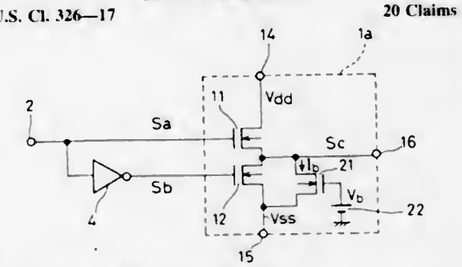
(b) biasing means, coupled between the positive voltage rail and the input on the sense amplifier, for biasing the pre-charge load device in relation to varying capacitance on the input to the sense amplifier.

5,587,667

OUTPUT BUFFER CIRCUIT FOR HIGH-SPEED LOGIC OPERATION

Daijiro Inami, Tokyo, and Yuichi Sato, Miyagi, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,118
Claims priority, application Japan, Dec. 20, 1994, 6-316725
Int. Cl.[6] H03K *19/017*
U.S. Cl. 326—17 20 Claims



1. An output buffer circuit comprising:

a first FET whose gate is applied with a first input digital signal;

a second FET whose gate is applied with a second input digital signal;

said first FET and said second FET being serially connected to each other and operating to be opposite in logic state to each other; and

a current source for causing a bias current having the same direction as that of a drain current of said first FET to flow through said first FET in the OFF state;

wherein a digital output signal is taken out from a connection point of said first FET and said second FET;

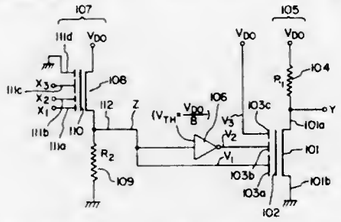
and wherein a turn-on speed of said first FET from the pseudo-OFF state to the ON state is enhanced by said bias current.

5,587,668

SEMICONDUCTOR DEVICES UTILIZING NEURON MOS TRANSISTORS

Tadashi Shibata, 5-2, Nihondaira, Taihaku-ku, Sendai-shi, Miyagi-ken 980, Japan, and Tadahiro Ohmi, 1-17-301, Komega bukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, Japan

PCT No. PCT/JP92/00347, § 371 Date Sep. 20, 1993, § 102(e) Date Sep. 20, 1993, PCT Pub. No. WO92/16971, PCT Pub. Date Oct. 1, 1992
PCT Filed Mar. 21, 1993, Ser. No. 119,157
Claims priority, application Japan, Mar. 21, 1991, 3-083152
Int. Cl.[6] H03K *19/017*
U.S. Cl. 326—36 36 Claims



1. A semiconductor device, comprising:

a first neuron MOS transistor having a first semiconductor region of one conductivity type disposed on a substrate, a first source region and a first drain region of a conductivity type opposite to said first semiconductor region provided within said first semiconductor region, a first floating gate electrode having a floating potential and isolated from said first source region and said first drain region, said first floating gate electrode capacitively coupled to said first semiconductor region by means of a first insulation film, a plurality of control gate electrodes capacitively coupled to said first floating gate electrode by means of a second insulation film;

a means for inputting a first signal into said first neuron MOS transistor connected to a first control gate electrode; and

a first inverter comprising at least one stage and having an input and an output, said input connected to said means for inputting a first signal and said output connected to a second control gate electrode.

5,587,669

PROGRAMMABLE APPLICATION SPECIFIC INTEGRATED CIRCUIT AND LOGIC CELL THEREFOR

Andrew K. Chan, Palo Alto; John M. Birkner, Woodside, and Hua T. Chua, Los Altos Hills, all of Calif., assignors to QuickLogic Corporation, Calif.

Continuation of Ser. No. 189,352, Jan. 31, 1994, Pat. No. 5,416,367, which is a continuation-in-part of Ser. No. 847,382, Mar. 6, 1992, abandoned, which is a continuation of Ser. No. 665,103, Mar. 6, 1991, Pat. No. 5,122,685. This application Mar. 3, 1995, Ser. No. 399,117
Int. Cl.[6] H03K *17/173*
U.S. Cl. 326—38 11 Claims

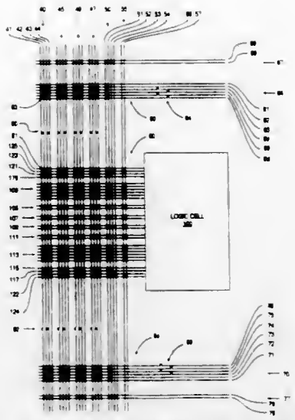
1. A field programmable gate array, comprising:

a first logic cell;

a second logic cell, said second logic cell having a plurality of input leads and at least one output lead;

a plurality of parallel wire segments disposed entirely between said first and second logic cells, each of said plurality of parallel wire segments extending in a first dimension toward said second logic cell, each respective one of said plurality of parallel wire segments being coupled to a respective one of said plurality of input leads or to said at least one output lead;

a power wire extending in said second dimension, said second dimension being substantially perpendicular to said first dimension, said power wire crossing each of said plurality of parallel wire segments; and



a plurality of antifuses, a respective one of said plurality of antifuses being disposed to programmably couple said power wire to a respective one of said plurality of input leads, wherein no antifuse is disposed between said power wire and any one of said plurality of parallel wire segments coupled to said at least one output lead.

5,587,670

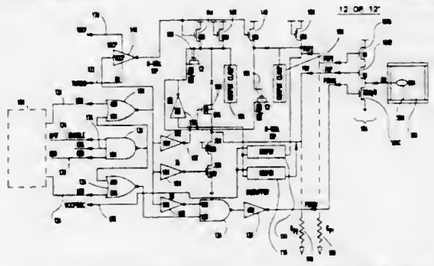
Patent Not Issued For This Number

5,587,671

SEMICONDUCTOR DEVICE HAVING AN OUTPUT BUFFER WHICH REDUCES SIGNAL DEGRADATION DUE TO LEAKAGE OF CURRENT

Paul Zagar, and Troy Manning, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed May 5, 1994, Ser. No. 238,972
Int. Cl.[6] H03K *19/0944*
U.S. Cl. 326—83 24 Claims



1. A semiconductor circuit device operating from at least one supply voltage and common, comprising:

a pre-output circuit generating a control signal;

a logic circuit generating an enable signal in response to the control signal;

an NMOS output circuit having an input node coupled to the control signal and having an output node providing an output signal corresponding to the control signal, the input node of the NMOS output circuit coupled to common through parasitic resistance;

an oscillation circuit for providing an oscillating digital signal; and

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a booster circuit, responsive to the oscillating digital signal and to the control signal being in one of two predetermined states, accumulating energy from the oscillating digital signal and providing a boost signal therefrom, also in response to the enable signal, for the input node of the NMOS output circuit to compensate for leakage current.

5,587,672

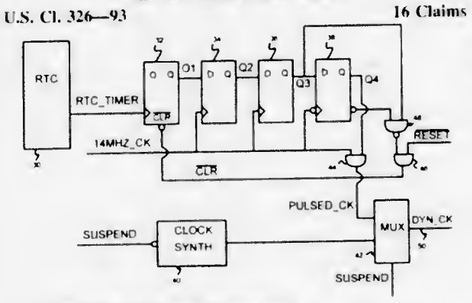
DYNAMIC LOGIC HAVING POWER-DOWN MODE WITH PERIODIC CLOCK REFRESH FOR A LOW-POWER GRAPHICS CONTROLLER

Ravi Ranganathan, Cupertino, and Deepraj S. Puar, Sunnyvale, both of Calif., assignors to NeoMagic Corp., Santa Clara, Calif.

Filed Sep. 25, 1995, Ser. No. 533,647

Int. Cl.[6] H03K *19/00;19/096*

U.S. Cl. 326—93 **16 Claims**



1. A dynamic logic circuit comprising:

a plurality of dynamic logic cells, each dynamic logic cell having:

an output;

an input;

isolation means for electrically isolating the input from other dynamic logic cells in response to a clock;

logic means for performing a logic function, the logic means including a pull-up transistor for connecting the output to a power supply in response to a voltage on the input, the logic means also including a pull-down transistor for connecting the output to ground in response to a voltage on the input;

a clock generator for generating the clock to the isolation means in the plurality of dynamic logic cells, the clock generator comprising:

an operating mode clock input for receiving an operating mode clock;

a pulse generator for generating a first output, the first output receiving a recharging clock pulse when not in an operating mode, the pulse generator including constant voltage means for outputting to the first output a constant voltage between recharging clock pulses;

selector means for selecting as the clock to the plurality of dynamic logic cells the operating mode clock during an operating mode but selecting the first output from the pulse generator when not in the operating mode,

a clock synthesizer for generating the operating mode clock, the clock synthesizer generating a continuous stream of periodic clock pulses during the operating mode but not generating any pulses when not in the operating mode, the clock synthesizer being powered-down when not in the operating mode,

whereby the plurality of dynamic logic cells are driven by the operating mode clock during operating mode but receive the recharging clock pulse and constant voltage when not in the operating mode.

5,587,673

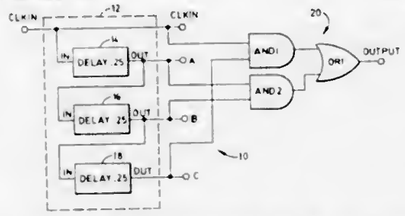
CLOCK FREQUENCY MULTIPLYING AND SQUARING CIRCUIT AND METHOD

James B. MacDonald, Dracut, Mass., assignor to Wang Laboratories, Inc., Billerica, Mass.

Continuation of Ser. No. 135,113, Oct. 12, 1993, Pat. No. 5,475,322. This application Nov. 22, 1995, Ser. No. 562,228

Int. Cl.[6] H03K *3/017*

U.S. Cl. 326—93 **9 Claims**



1. A circuit for generating an output signal having a frequency that is a multiple of an input clock signal (CLKIN), comprising:

delay means having an input node and a plurality of output nodes (A, B, C), said input node for coupling to the input clock signal, said delay means being comprised of a first delay element means having an input for coupling to the input clock signal and an output coupled to a first one of said plurality of output nodes, a second delay element means having an input coupled to said output of said first delay element means and an output coupled to a second one of said plurality of output nodes, and a third delay element means having an input coupled to said output of said second delay element means and an output coupled to a third one of said plurality of output nodes, individual ones of said plurality of output nodes outputting a signal that preserves a waveform shape of the input clock signal and that is delayed with respect to the input clock signal and also with respect to others of said plurality of output nodes; and

combinatorial logic means having a first input for coupling to the input clock signal and a plurality of second inputs for coupling to said output nodes of said first, second, and third delay element means, said combinatorial logic means comprising first and second two-input gate means having inputs coupled to said input clock signal and to said plurality of output nodes of said first, second, and third delay element means, said combinatorial logic means further comprising a third, two-input gate means having its inputs coupled to outputs of said first and second gate means, said third gate means further having an output for outputting a signal having a frequency that is a multiple of a frequency of the input clock signal and that is synchronous therewith, said combinatorial logic means operating to logically combine signals emanating from said plurality of output nodes with the input clock signal without storing said input clock signal and without storing any of said signals emanating from said output nodes.

5,587,674

COMPARATOR WITH BUILT-IN HYSTERESIS

Eric J. Danstrom, Farmington Hills, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

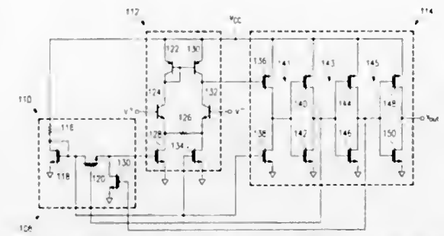
Continuation-in-part of Ser. No. 366,492, Dec. 30, 1994, abandoned. This application Apr. 7, 1995, Ser. No. 418,558

Int. Cl.[6] H03K *5/22*

U.S. Cl. 327—67 **6 Claims**

1. A comparator circuit comprising:

a differential input stage having a V^+ input for receiving a first voltage, a V^- input for receiving a second voltage, having a first bias voltage input, having a second bias voltage input, and having an output;



an output stage having an input for receiving the output of the differential input stage and having an output, the output stage comprising at least one inverter; and

a bias circuit having a bias voltage connected to the first bias voltage input of the differential input stage and having a hysteresis circuit wherein the hysteresis circuit comprises:

a means for selectively applying the bias voltage to the second bias voltage input of the differential amplifier, wherein the means for selectively applying the bias voltage comprises:

a first transistor having a current path between the bias voltage and the second bias voltage input of the differential input stage and having a control element connected to the input of the at least one inverter of the output stage, and

a second transistor having a current path connected between the second bias voltage input and ground, and having a control element connected to the output of the at least one inverter of the output stage.

5,587,675

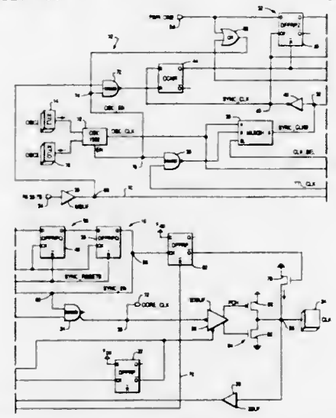
MULTICLOCK CONTROLLER

Kenneth C. Schmitt, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed Aug. 12, 1993, Ser. No. 105,990

Int. Cl.[6] H03K *17/00*

U.S. Cl. 327—99 **30 Claims**



1. A multi-clock controller circuit, comprising:

a first input for receiving a first type of input clock signal;

a second input for receiving a second type of input clock signal;

an output for providing a circuit output clock signal;

a circuit device for sensing and selecting which one of the two inputs has an active clock signal applied thereto, and for coupling said active clock signal to said output; and

a synchronizer stage for delaying the output signal for a period sufficient to avoid non-standard output pulses during powering down of the multi-clock controller circuit.

5,587,676

DRIVER CIRCUIT

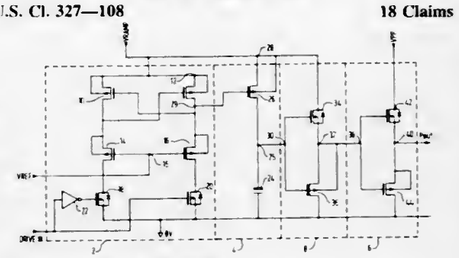
Vivek Chowdhury, Heston, United Kingdom, assignor to S GS - Microelectronics Limited, Buckingham, England

Filed Sep. 27, 1994, Ser. No. 312,877

Claims priority, application United Kingdom, Oct. 1, 1993, 9320246

Int. Cl.[6] H03K *17/26*

U.S. Cl. 327—108 **18 Claims**



1. A driver circuit comprising:

an input stage having an input node for receiving a control signal;

a capacitor circuit connected to said input stage and a first power supply and arranged to be charged up by said first power supply under the control of said control signal;

an output stage connected to a second power supply and arranged to provide a driver signal in dependence on the charge stored at said capacitor circuit, wherein a buffer circuit is connected between the capacitor circuit and the output stage; and

wherein the first and second power supplies are ramped power supplies with respectively different timings.

5,587,677

COMBINED CMOS AND NPN OUTPUT PULL-UP CIRCUIT

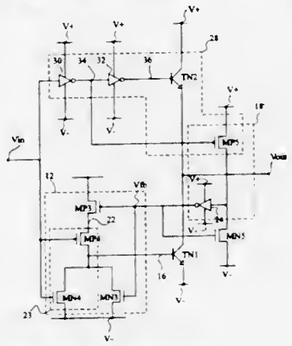
Davoud Samani, Saint Martin Le Vinoux, France, assignor to SGS-Thomson Microelectronic S.A., Saint Genis Pouilly, France

Filed Dec. 20, 1994, Ser. No. 359,700

Claims priority, application European Pat. Off., Dec. 23, 1993, 93420510

Int. Cl.[6] H03K *5/12*

U.S. Cl. 327—108 **36 Claims**



1. A BiCMOS output stage comprising:

a first NPN bipolar transistor connected between an output terminal and a positive supply voltage;

a first P-MOS transistor connected in parallel with the first NPN bipolar transistor;

a first inverter receiving an input signal and controlling a gate of the first P-MOS transistor;

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a second inverter receiving the output of the first inverter for controlling a base of the first NPN transistor;

a first N-MOS transistor connected between the output terminal and a negative supply voltage;

a second NPN bipolar transistor connected in parallel with the first N-MOS transistor;

a control circuit for switching on said second NPN transistor when said input signal is such that said output terminal must be pulled down; and

a third inverter having an input connected to the output terminal and whose output controls the gate of said first N-MOS transistor and provides an active high signal to said control circuit for switching off said second NPN bipolar transistor.

5,587,678

INTEGRATED CIRCUIT HAVING AN OUTPUT STAGE WITH A MILLER CAPACITOR

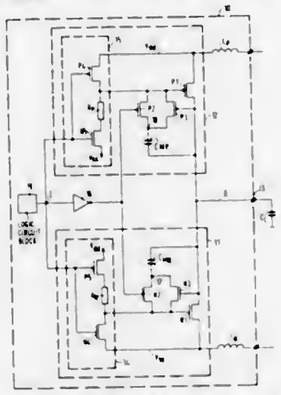
Eise C. Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1995, Ser. No. 437,750

Claims priority, application European Pat. Off., May 9, 1994, 94201298

Int. Cl.[6] **H03F** *3/26;* **H03K** *19/003*

U.S. Cl. 327—108 **7 Claims**



1. An integrated circuit, comprising an output stage with an input which is coupled to a first and a second control electrode of a first and a second output stage current channel, respectively, and an output which is connected to a first and a second supply terminal via the first and the second current channel, respectively, said output stage switching over, under the control of a signal on the input, from a first state (L) in which the first and the second current channel are conductive and non-conductive, respectively, to a second state (H) in which the first and the second current channel are non-conductive and conductive, respectively, the output being coupled to the first control electrode via a series connection of a Miller capacitor and switching means, said integrated circuit being characterized in that it comprises means for rendering the switching means non-conductive ahead of the switching over from the first state (L) to the second state (H).

5,587,679

PULSE GENERATOR INCLUDING SLEW RATE CONTROLLER WITHOUT COMPLEMENTARY TRANSISTORS

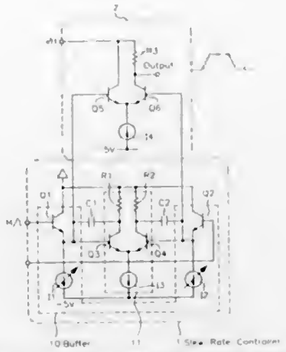
Makoto Imamura, Tokyo, Japan, assignor to Yokogawa Electric Corporation, Tokyo, Japan

Filed May 8, 1995, Ser. No. 436,693

Int. Cl.[6] **H03K** *5/12*

U.S. Cl. 327—170 **12 Claims**

1. A pulse generator for generating a pulse, comprising:



buffer means for receiving a differential signal and for producing an output signal, said buffer means comprising a pair of selectively controllable current sources;

a first differential amplifier for receiving said output signal from said buffer means and for producing another differential signal, said first differential amplifier comprising a positive input terminal, a negative input terminal, a positive output terminal, and a negative output terminal;

a first capacitor connected between said positive input terminal and said negative output terminal of said first differential amplifier, and being caused to be charged by said buffer means and selectively controlling said first differential amplifier;

a second capacitor connected between said negative input terminal and said positive output terminal of said first differential amplifier, and being caused to be charged by said buffer means and selectively controlling said first differential amplifier;

wherein said another differential signal is obtained at connections of said first and second capacitors and said positive and negative input terminals of said first differential amplifier; and

means for receiving said another differential signal and in response thereto for producing said pulse, whereby a rising slew rate of said pulse is selectively controlled by one of said pair of current sources of said buffer means and a falling slew rate of said pulse is selectively controlled by the other of said pair of current sources of said buffer means without the use of complementary transistors.

5,587,680

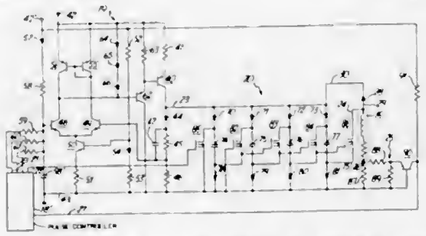
PULSE GENERATOR WITH CHARGE PUMP

Stephen W. Smith, Raleigh, N.C., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jun. 30, 1995, Ser. No. 497,210

Int. Cl.[6] **G06F** *1/04*

U.S. Cl. 327—291 **23 Claims**



1. A current pulse generation system for generating current pulses on an electrical pulse conductor, said current pulse generation system comprising:

a variable magnitude pulse former having a magnitude control input, a pulse initiation input, and an output electrically connected to said pulse conductor, said variable magnitude current pulse former being capable of forming a current pulse at said output thereof upon an initiation signal being provided to said initiation input thereof with said current pulse having a magnitude substantially determined by a magnitude control signal provided at said magnitude control input thereof;

a magnitude control signal generator having an input, and having an output electrically connected to said variable magnitude pulse former magnitude control input, said magnitude control signal generator providing a signal at said output thereof having a magnitude determined by a signal applied to said input thereof;

a current pulse magnitude sensor having an input electrically connected to said pulse conductor and having an output, said current pulse magnitude sensor providing an output signal on said output thereof indicative of magnitudes reached by current pulses occurring on said pulse conductor; and

a pulse controller having an input electrically coupled to said current pulse magnitude sensor output, a selection output electrically connected to said magnitude control signal generator input, and an initiation output electrically connected to said variable magnitude pulse former initiation input, said pulse controller being capable of providing initiation signals on selected occasions of selected magnitudes on said initiation output thereof.

5,587,681

DC RESTORATION CIRCUIT

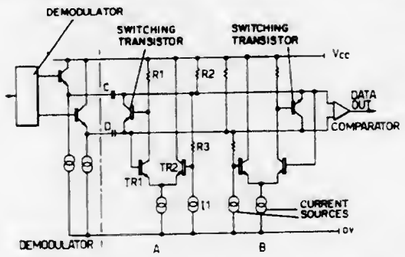
Ian G. Fobbester, Gloucestershire, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Oct. 18, 1994, Ser. No. 324,911

Claims priority, application United Kingdom, Oct. 29, 1993, 9322273

Int. Cl.[6] **H03K** *5/08*

U.S. Cl. 327—307 **4 Claims**



1. A D.C. restoration circuit for digital data signals appearing differentially between first and second input lines, said data signals being superimposed on a variable D.C. level, comprising: first and second capacitors; means for connecting said first capacitor between said first input line and a first output of said D.C. restoration circuit; means for connecting said second capacitor between said second input line and a second output of said D.C. restoration circuit; first and second switching transistors each having emitter, base and collector electrodes; means for connecting the emitter electrode and the collector electrode of said first switching transistor to said first output and to said second output respectively; means for connecting the emitter electrode and the collector electrode of said second switching transistor to said second output and to said first output, respectively; and means responsive to signal voltages at said first and second outputs to forward bias the base electrodes of said first and second switching transistors with respect to their respective emitter electrodes when the signal voltages at said first and second outputs exceed respective predetermined values.

5,587,682

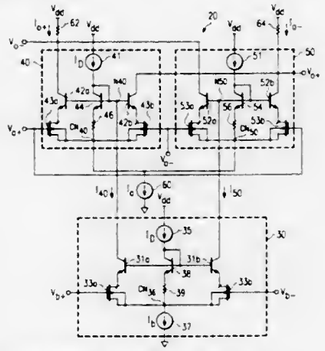
FOUR-QUADRANT BICMOS ANALOG MULTIPLIER

Gianluca Colli, Sannazzaro De Burgondi; Massimo Franciotta, Pavia, and Rinaldo Castello, Arcore, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Brianza, Italy

Filed Mar. 30, 1995, Ser. No. 413,772

Int. Cl.[6] **G06G** *7/16;* **H03K** *5/22*

U.S. Cl. 327—357 **14 Claims**



1. An analog multiplier circuit, comprising:

a first transconductance stage, comprising:

first and second differential legs, each comprising a bipolar transistor and a MOS transistor connected in series, wherein the MOS transistor in the first differential leg has a source connected to a first common node and a gate for receiving a first input voltage and wherein the MOS transistor in the second differential leg has a source connected to the first common node and a gate for receiving a second input voltage;

a first reference leg, for biasing the bipolar transistors in the first and second differential legs into an active state, so that the MOS transistors in the first and second differential legs are biased into the triode region;

a second transconductance stage, cross-coupled with the first transconductance stage, and comprising:

third and fourth differential legs, each comprising a bipolar transistor and a MOS transistor connected in series, wherein the MOS transistor of the third differential leg has a source connected to a second common node and a gate for receiving the second input voltage and wherein the MOS transistor of the fourth differential leg has a source connected to the second common node and a gate for receiving the first input voltage; and

a second reference leg, for biasing the bipolar transistors in the third and fourth differential legs into an active state, so that the MOS transistors in the third and fourth differential legs are biased into the triode region;

a first sum current source, connected between the first and second common nodes of the first and second transconductance stages and a reference voltage; and

a third transconductance stage, comprising:

fifth and sixth differential legs, each comprising a bipolar transistor and a MOS transistor connected in series, wherein the MOS transistor in the fifth differential leg has a source connected to a third common node and a gate for receiving a third input voltage and wherein the MOS transistor in the sixth differential leg has a source connected to the third common node and a gate for receiving a fourth input voltage;

a third reference leg for biasing the bipolar transistors of the fifth and sixth differential legs into an active state, so that the MOS transistors in the fifth and sixth differential legs are biased in the triode region; and

a second sum current source, connected between the third common node of the third transconductance stage and the reference voltage;

wherein the bipolar transistor in the fifth differential leg has a collector connected to the reference leg of the first transconductance stage;

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and wherein the bipolar transistor in the sixth differential leg of the third transconductance stage has a collector connected to the reference leg of the second transconductance stage.

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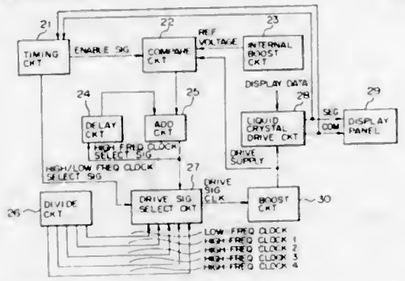
BOOSTER CIRCUIT DEVICE
Masayuki Kawasaki; Yasunori Kuwasima; Hidehiko Tachibana, all of Ooita; Syuji Katsuki, and Akihiro Sueda, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan
Filed Dec. 6, 1994, Ser. No. 350,353
Claims priority, application Japan, Dec. 9, 1993, 5-309076
Int. Cl.[6] G05F *1/10;3/02*
U.S. Cl. 327—538 **7 Claims**



1. A booster circuit device comprising:

a liquid crystal drive circuit for outputting a signal to a liquid crystal display panel;

a timing circuit for outputting a select signal responsive to changes in the signal outputted by the liquid crystal drive circuit, wherein the timing circuit outputs a high frequency clock select signal in response to a high current demand in the liquid crystal drive circuit when the signal outputted by the liquid crystal drive circuit changes, and outputs a low frequency clock select signal in response to a low current demand in the liquid crystal drive circuit when the signal outputted by the liquid crystal drive circuit does not change;

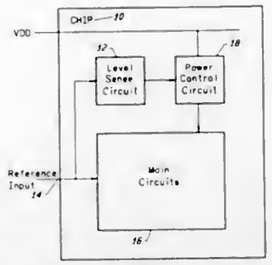
a drive signal select circuit for selecting a low frequency clock having a first frequency when said timing circuit outputs the low frequency clock select signal, and for selecting any one of at least two high frequency clocks having frequencies higher than the first frequency when said timing circuit outputs the high frequency clock select signal, the selected clock being outputted as a drive signal;

a booster circuit for supplying a supply voltage to said liquid crystal drive circuit on the basis of the drive signal outputted by said drive signal select circuit; and

control means for comparing the supply voltage outputted by said booster circuit with a reference voltage when the said timing circuit outputs the high frequency clock select signal, and for controlling said drive signal select circuit to sequentially select a higher frequency clock than a previously selected high frequency clock from the at least two high frequency clocks until the supply voltage reaches the reference voltage.

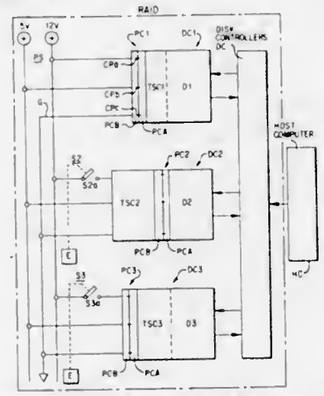
5,587,684
POWER DOWN CIRCUIT FOR USE IN INTERGRATED CIRCUITS
Jose A. Salcedo, Livermore, Calif., assignor to Exar Corporation, San Jose, Calif.
Filed May 12, 1995, Ser. No. 440,272
Int. Cl.[6] G05F *1/10;* **H03K** *17/22*
U.S. Cl. 327—538 **8 Claims**

1. A packaged analog integrated circuit having a package pin which receives a reference voltage from an external source for use



as a reference in analog/digital voltage conversions, said circuit comprising a plurality of circuit stages each receiving electrical power from a power source, conductor means for applying said reference voltage from said external source to said integrated circuit, and power control circuitry for selectively controlling electrical power to said circuit stages in response to said reference voltage, said power control circuitry including switch means for connecting and disconnecting said power source to said circuit stages, logic means responsive to said reference voltage for controlling said switch means, said logic means including a comparator for comparing said reference voltage to an internal threshold voltage, and, means for generating said threshold voltage from said power source.

5,587,685
SYSTEM FOR SUPPRESSING POWER TRANSIENTS WHEN CONNECTING A DISK DRIVE IN AN OPERATING RAID SYSTEM
Christopher W. Johansson, Horseshoe Bend, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 331,468, Oct. 31, 1994, abandoned.
This application Nov. 22, 1995, Ser. No. 562,263
Int. Cl.[6] G05F *3/02*
U.S. Cl. 327—546 **8 Claims**



1. A system of control for electrically interconnected discrete devices, comprising:

a. an electrical power supply having at least a first and a second voltage terminal;

b. a plurality of discrete devices connected to said electrical power supply;

c. a device controller for electrically controlling said discrete devices in a predetermined functional relationship;

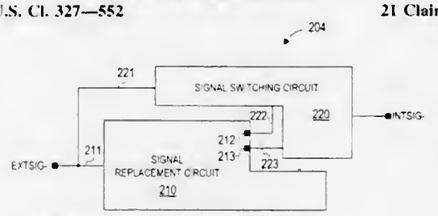
d. at least a first and second transient suppression circuit (TSC) coupled to at least one of said plurality of discrete devices, for suppressing transient currents, said first TSC comprising a first active circuit element, and said second TSC comprising a second active circuit element, and each said active circuit element having an output terminal connected to said at least one discrete device and having an active circuit element input;

e. said first transient suppression circuit further comprising a first capacitor and voltage divider circuit for generating a time varying voltage signal input to said first active circuit element to control conduction of said first active circuit element;

f. said second transient suppression circuit further comprising a second capacitor and voltage divider circuit for generating a time varying voltage signal input to said second active circuit element to control conduction of said second active circuit element; and,

g. connector means for coupling one of said power supply voltage terminals to said first active circuit element input and to said first and second capacitor and voltage divider circuits, and the other of said power supply voltage terminals to said second active circuit element input, and wherein said connector means include, a plurality of pin connectors each having a substantially similar length.

5,587,686
TIME DOMAIN SIGNAL FILTER
Salil Suri, Fremont, and Sassan Teymouri, Saratoga, both of Calif., assignors to Adaptec, Inc., Milpitas, Calif.
Filed Sep. 2, 1994, Ser. No. 300,284
Int. Cl.[6] H03K *5/00;9/06*
U.S. Cl. 327—552 **21 Claims**



1. A time domain signal filter comprising:

a signal replacement circuit having:

a signal replacement circuit input line,

a first signal replacement circuit output terminal and

a second signal replacement circuit output terminal,

wherein in response to a predetermined signal change on said signal replacement circuit input line, said signal replacement circuit generates an active signal on said first signal replacement circuit output terminal for a predetermined time period; and

a signal switching circuit having:

a first signal switching circuit input line connected to said first signal replacement circuit input line,

a second signal switching circuit input line connected to said first signal replacement circuit output terminal,

a third signal switching circuit input line connected to said second signal replacement circuit output terminal, and

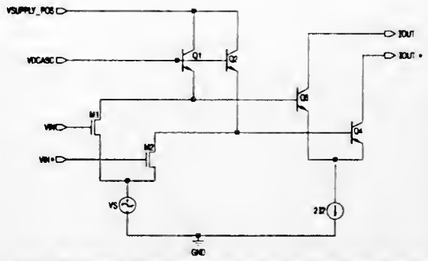
a signal switching circuit output terminal,

wherein said signal switching circuit disconnects said first signal switching circuit input line from said signal switching circuit output terminal and connects said third signal switching circuit input line to said signal switching circuit output terminal for said predetermined time period in response to said active signal on said second signal switching circuit input line; and

further wherein said predetermined signal change occurs at least from a first signal level to a second signal level.

5,587,687
MULTIPLIER BASED TRANSCONDUCTANCE AMPLIFIERS AND TRANSCONDUCTANCE CONTROL CIRCUITS
William J. Adams, Irvine, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.
Filed Feb. 2, 1995, Ser. No. 383,310
Int. Cl.[6] H03F *3/45*
U.S. Cl. 330—253 **32 Claims**

1. A transconductance amplifier comprising:

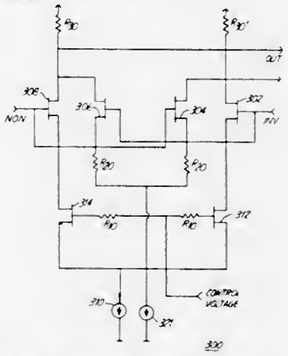


a FET differential input stage, the input stage having a current output; and,

a Gilbert multiplier output stage coupled to the output of the input stage to amplify the current output of the FET differential input stage;

the FET differential input stage having a pair of FET transistors each having a source, a drain and a gate, the drains of the pair of FET transistors being directly coupled to the Gilbert multiplier output stage, the sources of the pair of FET transistors being coupled to a bias voltage and the gates of the pair of FET transistors forming the differential input thereof.

5,587,688
DIFFERENTIAL AUTOMATIC GAIN-CONTROL AMPLIFIER HAVING AN ENHANCED RANGE
Mark M. Mulbrook, Marion, Iowa, assignor to Rockwell International Corp., Seal Beach, Calif.
Continuation of Ser. No. 331,833, Oct. 31, 1994, abandoned.
This application Nov. 1, 1995, Ser. No. 551,358
Int. Cl.[6] H03F *3/45*
U.S. Cl. 330—253 **2 Claims**



1. A differential amplifier circuit comprising:

a first pair of transistors, each coupled to a first common driving signal at their gate electrode;

a second pair of transistors, each coupled to a second common driving signal at their gate electrode;

a plurality of current sources coupled to each pair of transistors via a source electrode of each transistor;

a pair of input transistors electrically coupled in parallel between the plurality of current sources and a source electrode of a transistor from the first and second pair of transistors; and

a pair of resistors coupled in series between the first and second input transistors for circuit stability;

wherein a drain electrode of a first transistor from the first pair of transistors is coupled in common to a drain electrode of a first transistor from the second pair of transistors, and the drain electrodes of the second transistors from the first and second pair of transistors are coupled in common, thereby

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establishing an output signal of said circuit obtained across the paired drain electrodes of the first and second pair of transistors; and

wherein the second driving signal is an inverted signal of the first driving signal and thereby extends the differential amplifier circuit range by increasing the attenuation level of the circuit.

5,587,689

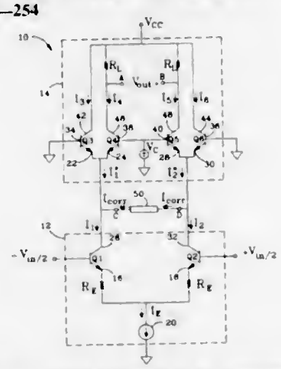
VOLTAGE CONTROLLED AMPLIFIER WITH A NEGATIVE RESISTANCE CIRCUIT FOR REDUCING NON-LINEARITY DISTORTION

Derek F. Bowers, Sunnyvale, Calif., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 28, 1995, Ser. No. 536,497

Int. Cl.[6] H23G *3/32;* **H03F** *3/45*

U.S. Cl. 330—254 **8 Claims**



1. A voltage controlled amplifier (VCA), comprising:

an input differential stage including a pair of differentially connected primary transistors that respond to an input signal by producing a differential signal current at a pair of control terminals, said transistors having different pn junction voltages that induce non-linearity distortion in the differential signal current which produces a differential error voltage between the control terminals;

a gain control stage that has a gain control input, said gain control stage producing a differential output current and a differential control current that sum together to provide said differential signal current and responding to a gain control signal applied to said gain control input to apportion a fraction G of the differential signal current to the differential output current to set the gain of the VCA; and

a negative resistance circuit connected between said control terminals to compensate for the differential error voltage and thereby alter said differential output current to reduce its non-linearity distortion.

5,587,690

RING RESONATOR OSCILLATOR USABLE IN FREQUENCY SYNTHESIZERS AND COMMUNICATION APPARATUS

Hiroyuki Yabuki, Kawasaki; Morikazu Sagawa, Tokyo, and Mitsuo Makimoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 31, 1995, Ser. No. 509,663

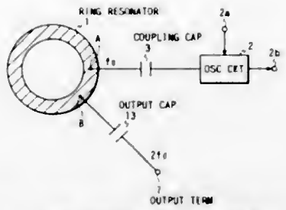
Claims priority, application Japan, Aug. 11, 1994, 6-189499; Sep. 22, 1994, 6-227923; Jan. 24, 1995, 7-009085

Int. Cl.[6] H03B *5/18;* **H30L** *7/099*

U.S. Cl. 331—2 **46 Claims**

1. An oscillator comprising:

a ring resonator;



an oscillation circuit having a negative resistance active circuit coupled to a first point on said ring resonator for oscillating at an oscillation frequency and resonating said resonator; and

an output terminal, coupled to a second point on said ring resonator where a voltage is substantially zero with respect to said oscillation frequency when said ring resonator resonates, for outputting a second harmonic frequency signal.

5,587,691

DIGITAL TRIMMING FOR FREQUENCY ADJUSTMENT

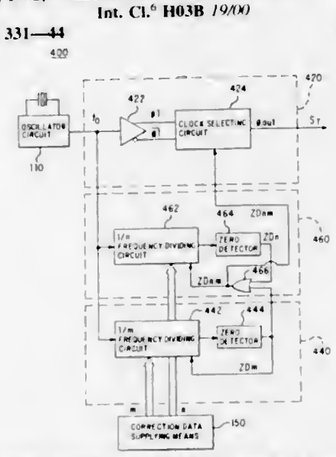
Hiroshi Yabe, and Tsutomu Ogihara, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-tu, Japan

Division of Ser. No. 47,279, Apr. 19, 1993. This application Jun. 7, 1995, Ser. No. 478,782

Claims priority, application Japan, Apr. 17, 1992, 4-097888; May 14, 1992, 4-122154; Feb. 22, 1993, 5-031783

Int. Cl.[6] H03B *19/00*

U.S. Cl. 331—44 **6 Claims**



1. A digital trimming apparatus for generating a time reference signal from a basic oscillation frequency supplied by an oscillation circuit, comprising:

digital trimming amount-to-pulse number converting means for generating a start control pulse signal within one digital trimming time period based on the basic oscillation frequency and a correction data, the correction data designating a digital trimming amount to be executed within the one digital trimming time period, a number of pulses in the start control pulse signal corresponding to the correction data; and

digital trimming amount applying means for generating the time reference signal from the basic oscillation frequency by executing a digital trimming operation by the digital trimming amount in response to the start control pulse signal, said digital trimming amount applying means comprising:

complementary signal forming means for forming an in-phase signal and a reverse phase signal based upon said basic oscillation signal; and

signal selecting means for selectively outputting said in-phase signal and said reverse phase signal.

5,587,692

COMMON MODE CURRENT CANCELLATION IN TWISTED PAIRS

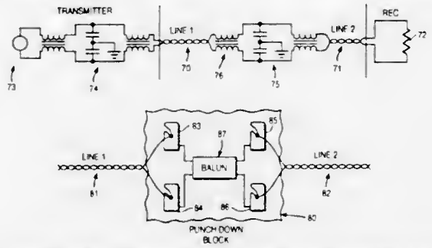
Martin H. Graham, Berkeley, and Matthew Taylor, Pleasant Hill, both of Calif., assignors to Tut Systems, Inc., Pleasant Hill, Calif.

Filed Nov. 28, 1994, Ser. No. 345,111

Claims priority, application WIPO, May 18, 1994, PCT/US94/05618

Int. Cl.[6] H04B *3/30*

U.S. Cl. 333—12 **3 Claims**



2. An improved punch down block for connecting together a first and a second twisted pair lines, each of the lines having a first and a second wire, comprising:

a board;

a first, second, third and fourth forked pins mounted on the board; and

a balun for canceling common mode currents resulting from different impedances in the first and second wires of the first and second twisted pair lines, the balun mounted on the board having four leads, each connected to one of the four pins such that a first electrical path exists through the balun between the first and third pins and a second electrical path exists between the second and fourth pins.

5,587,693

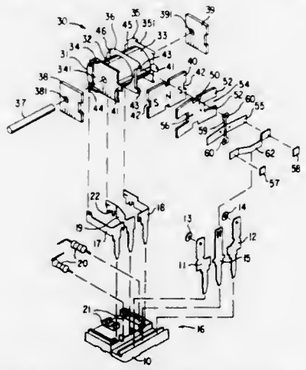
POLARIZED ELECTROMAGNETIC RELAY

Christopher Fear, Brighton, Mich., assignor to Siemens Electromechanical Components, Inc., Princeton, Ind.

Filed Aug. 7, 1995, Ser. No. 512,001

Int. Cl.[6] H01H *51/22*

U.S. Cl. 335—78 **20 Claims**



1. A polarized electromagnetic relay, comprising:

an insulating base defining a bottom plane;

an electromagnet block on the base having a core, means for exciting a coil including a bobbin and at least one winding about the core, and a pair of pole pieces extending perpendicularly from the ends of said core;

an elongate armature pivotally supported at its central portion to be movable about a center pivot axis for angular movement between two contact operating positions, either end portion of the armature on either side of the pivot axis defining an air gap with one of said pole pieces;

a permanent magnet coupled magnetically between said core and said armature so as to induce the same magnetic poles in both said pole pieces and to provide an opposite pole in closely adjacent relationship to said central portion of the armature;

at least one movable contact spring fixedly connected to the armature at a portion intermediate the ends thereof and being formed with contact arms in the vicinity of either armature end portion, said contact arms carrying movable contacts to be moved according to the armature movement in and out of contact with corresponding fixed contacts mounted on said base;

a pair of torsion pivot arms extending transversely in opposite directions from said at least one contact spring along the pivot axis of said armature, a distal end of either pivot arm being fixedly connected to a support being part of or fixedly connected to said electromagnet block and extending around either side of the armature; and

a conductor connecting said contact arms with a movable contact terminal mounted on said base; wherein said at least one movable contact spring is made from a material having high resilience and said conductor is made of flexible construction from a material having high conductivity.

5,587,694

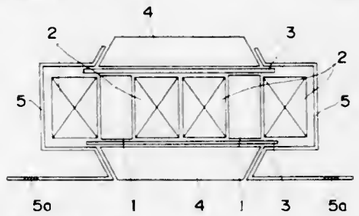
REACTOR WITH CORE GAP SPACERS

Tetsuya Minato, Neyagawa; Toshimitsu Yonehara, Osaka; Junichi Teranishi, Ikoma; Shohei Toyoda, Kyoto; Toshiaki Bito, Neyagawa, and Kazushige Takashima, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Dec. 28, 1994, Ser. No. 365,157

Int. Cl.[6] H01F *15/02;27/26;27/30*

U.S. Cl. 336—65 **13 Claims**



1. A reactor comprising:

a pair of coils;

a pair of first iron cores disposed in parallel and respectively extending through said coils, each of said first iron cores being formed of laminated electromagnetic steel plates;

a pair of second iron cores abutted against said first iron cores, via core gap spacers, such that a square-shaped magnetic path is formed, each of said second iron cores being formed of laminated electromagnetic plates;

wherein one of said first and second pairs of iron cores constitutes an outer pair of iron cores and the other of said first and second pairs of iron cores constitutes an inner pair of iron cores, and said inner pair of iron cores is sandwiched between said outer pair of iron cores;

wherein each of said iron cores of said outer pair of iron cores is a trapezoid-shaped iron core having four contiguous straight sides, two of which are parallel to one another;

wherein for each of said trapezoid-shaped iron cores, one of said two parallel sides is a short parallel side and the other of said two parallel sides is a long parallel side which is longer than said short parallel side; and

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wherein said long parallel side of each of said trapezoid-shaped iron cores is disposed between said short parallel sides of said trapezoid-shaped iron cores, respectively.

5,587,695

MEASURING TRANSFORMER FOR SOLID-STATE ELECTRICITY METERS

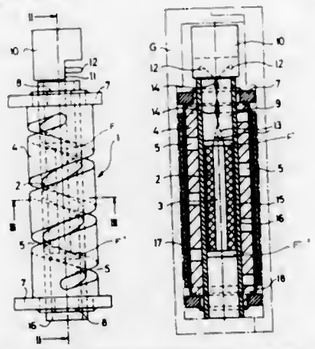
Petrus Warmerdam, Wetzikon, Switzerland, assignor to Zellweger Luwa AG, Switzerland

Continuation of Ser. No. 988,313, Dec. 9, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 287,004

Claims priority, application Switzerland, Dec. 13, 1991, 03672/91

Int. Cl.[6] H01F *27/28*

U.S. Cl. 336—84 R **23 Claims**



1. Apparatus for measuring electricity, comprising:

a primary conductor having a helical body for carrying current to be measured, said helical body being shaped to define an interior and having a helical groove;

a secondary coil which is inserted into the interior of said primary conductor such that said helical body surrounds the secondary coil with at least one turn to magnetically couple said primary conductor and said secondary coil; and

a winding provided between said primary conductor and said secondary coil for reducing capacitive coupling between said primary conductor and said secondary coil.

5,587,696

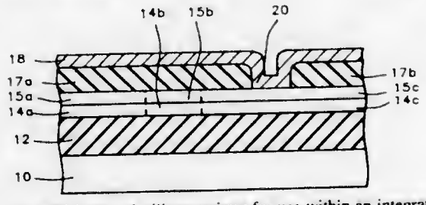
HIGH RESISTANCE POLYSILICON RESISTOR FOR INTEGRATED CIRCUITS AND METHOD OF FABRICATION THEREOF

Chung-Hui Su; Mong-Song Liang, both of Hsin-chu; Shou-Gwo Wuu, Hsinchu County, and Chen-Jong Wang, Hsinchu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Jun. 28, 1995, Ser. No. 496,018

Int. Cl.[6] H01C *1/012*

U.S. Cl. 338—314 **15 Claims**



1. A multi-layer polysilicon resistor for use within an integrated circuit comprising:

a first polysilicon layer formed over an insulating layer upon a semiconductor substrate, the first polysilicon layer being formed at a first deposition temperature;

a minimum of a second polysilicon layer formed directly upon the first polysilicon layer, the second polysilicon layer being formed at a second deposition temperature, where the first deposition temperature and the second deposition temperature are in the range of from 450 to 620 degrees centigrade and the difference in temperature between the first deposition temperature and the second deposition temperature is greater than 10 degrees centigrade whereby there is formed a multi-layer polysilicon resistor of higher resistance than a single layer polysilicon resistor of equivalent aggregate thickness.

5,587,697

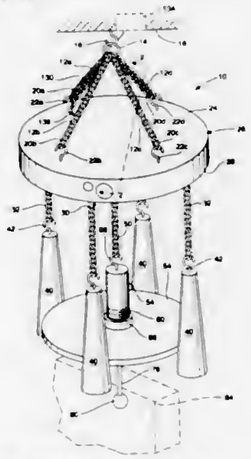
CHIME ALARM APPARATUS

Michael P. Rent, Box 287, Bridgetown, N.S., B0S 1C0, Canada

Filed Nov. 29, 1994, Ser. No. 350,103

Int. Cl.[6] G08B *3/00;* **G10K** *1/00*

U.S. Cl. 340—392.4 **6 Claims**



1. Chime alarm apparatus comprising:

a housing having an axis;

means for suspending said housing from rigid support means;

elongate support means for supporting a disc-shaped contact member, said support means having upper and lower ends,

means for suspending said elongate support means at its upper end from said housing and substantially coaxially therewith, whereby said elongate support means may swing laterally relative to said housing,

said disc-shaped contact member supported by said elongate support means intermediate the ends thereof, said lower end of said elongate support means including pendant means whereby the elongate support means may be caused to move laterally by an external force contacting said pendant means;

a plurality of chime members each having upper and lower ends and being suspended from said housing peripherally outwardly of, and spaced a selected distance from, said elongate support means and said disc-shaped contact member, each said chime member having an area of electrical contact between its ends, said pendant means being normally below the lower ends of said second members;

said disc-shaped contact member and said chime members being of a material whereby a chime sound is produced when the contact member moves laterally and contacts the area of contact of at least one of said chime members;

an electric circuit including in said circuit, a source of power, said disc-shaped contact member, said area of electrical contact of at least one of said chime members and including an alarm means separate from said chime members, whereby when said disc-shaped contact member contacts said area of contact of said least one chime member, the electric circuit is closed and said alarm means in the electric circuit is activated.

5,587,698

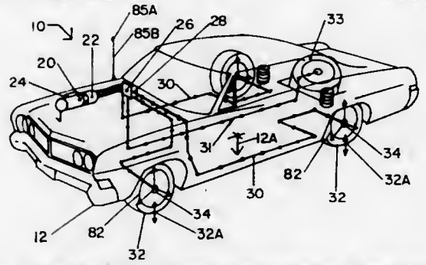
AUTOMATIC TIRE PRESSURE CONTROL SYSTEM FOR A VEHICLE

Robert A. Genna, 4 Talbot La., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 831,187, Feb. 5, 1992, abandoned. This application Feb. 28, 1995, Ser. No. 395,969

Int. Cl.[6] B60C *23/00*

U.S. Cl. 340—442 **6 Claims**



1. An automatic tire pressure control system for a vehicle, comprising:

means for compressing air;

means for delivering said compressed air to a tire of said vehicle;

first sensing means for sensing the air pressure in said tire;

first comparing means for comparing the sensed tire air pressure with at least a first preset value;

second sensing means for sensing the air temperature in said tire;

second comparing means for comparing said sensed tire air temperature with at least a second preset value;

third sensing means for sensing a surface temperature of said tire;

third comparing means for comparing said sensed tire surface temperature with at least a third preset value;

means for activating the delivering means to deliver air to and inflate said tire when said first comparing means determines that said sensed tire air pressure is below said first preset value;

means for deactivating the delivering means to stop the delivery of air to and inflation of said tire when said first comparing means determines that said sensed tire air pressure is at said first preset value;

means for remotely controlled venting of air from said tire;

means for activating said venting means to vent air from and deflate said tire when said first comparing means determines that said sensed tire air pressure is above said first preset value;

means for deactivating said venting means to stop the venting of air from and deflation of said tire when said first comparing means determines that said sensed tire air pressure is at said first preset value;

said means for compressing air comprising an air compressor, a compressed air reservoir connected to said air compressor to receive and store said compressed air, and a regulator to regulate air pressure in said reservoir;

means for calculating said sensed tire air pressure;

means for displaying said sensed tire air pressure in a first numeric display;

means for calculating said sensed tire air temperature;

means for calculating said sensed tire surface temperature;

means for displaying said sensed tire air temperature in a second numeric display;

means for displaying said sensed tire surface temperature in said second numeric display;

means for selecting said first, second and third preset values and displaying said first, second and third preset values in said numeric displays;

said delivering means comprising a distributor having a plurality of valve elements each having an air line leading to each tire of said vehicle, whereby said distributor selectively distribute said compressed air to a selected tire;

means for activating said plurality of valve elements to deliver air to and inflate said selected tire when said first comparing means determines that said sensed tire air pressure is below said first preset value;

means for deactivating said plurality of valve elements to stop the delivery of air to and inflation of said selected tire when said comparing means determines that said sensed tire air pressure is at said first preset value;

means for activating said plurality of valve elements to vent air from and deflate said selected tire when said first comparing means determines that said sensed tire air pressure is above said first preset value;

said air compressor having an outlet air line connected to said distributor;

said compressed air reservoir having an outlet air line connected to said distributor;

an inlet air line connecting said distributor to said compressor;

an inlet air line connecting said distributor to said compressed air reservoir;

each said air line being connected to each said tire by a sealing assembly comprising:

a first inlet air line in connection with said distributor and a metal housing of said sealing assembly;

two spaced annular means for sealing located around an axle whereby an annular air chamber is located about said axle with said inlet air line operably connected therewith;

said annular air chamber being capable of sustaining and containing pressurized air without leakage;

an outlet air line leading to a tire wheel, said wheel having an outer surface which is normally contained by a tire to form an airtight tire chamber;

a safety valve disposed in and in connection with said first inlet air line and being operable to permit passage of air only upon certain established conditions;

a remotely controlled two-way safety valve for air flow to said tire or air flow from said tire, disposed in said outlet air line and interfacing an air lock coupling in said wheel and said air lock coupling in a hub and being operable to permit passage of air only upon said certain established conditions;

said safety valve for preventing air loss from said airtight tire chamber and being disposed in said outlet air line and in connection with said tire wheel and interfacing said airtight tire chamber and being operable to permit passage of air only upon said certain established conditions;

an annular ferrofluid seal located to provide said annular air chamber about said axle, said annular air chamber being in connection with said safety valve of said inlet air line;

an annular sealing means comprising said annular ferrofluid seal having a fixed annular magnet fitted about said axle and flanking annular pole blocks and annular pole tips and a ferrofluid located between said annular pole blocks and the axle, thereby forming said annular air chamber between said pole blocks about the axle, said annular air chamber being in connection with said first inlet air line either through channels extending along the axle or through a passage formed in said fixed annular magnet and said metal housing, and further comprising annular carbon graphite seals operable as mechanical seals for preventing contaminants from entering said annular ferrofluid seal and as electrical conductors flanking said annular pole blocks and ring seals disposed about the outside perimeter of said annular pole blocks for the prevention of air leakage between said magnet and said pole blocks;

said mechanical seals located longitudinally outwardly and inwardly of said ferrofluid seals;

a plurality of air channels extending from said annular chamber longitudinally about the axle;

a bearing support shaft being fitted onto and in connection with a support shaft fitting;

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said bearing support shaft and said support shaft fitting fitted onto and in connection with said axle;

said bearing support shaft and said support shaft fitting with said plurality of air channels therebetween about the axle;

a shaft stop or a pair of shaft stops flanking said sealing assembly and being out of the air flow path and being about said axle;

said shaft stop or said pair of shaft stops flanking said sealing assembly and being in the air flow path and being provided with air cavities being in connection with said plurality of air channels and being about said axle;

said bearing operating on the outer radial surface of and in rolling connection with said bearing support shaft;

an outlet air line leading from said plurality of air channels to said tire wheel, said wheel having said outer surface which is normally contained by said tire to form an airtight tire chamber;

an outer radial surface of said support shaft fitting having a plurality of axial ribs with wider channels therebetween; and

an inner radial surface of said bearing support shaft having a plurality of axial ribs with wider channels therebetween; whereby,

said outer radial surface of said support shaft fitting with said plurality of axial ribs fits with substantial clearance in said wider channels of said inner radial surface of said bearing support shaft; and

said inner radial surface of said bearing support shaft with said plurality of axial ribs fits with substantial clearance in said wider channels of said outer radial surface of said support shaft fitting; whereby,

said plurality of axial ribs on said outer radial surface of said support shaft fitting and said plurality of axial ribs on said inner radial surface of said bearing support shaft, interlock and are supported at a plurality of bearing force transfer points located in a central portion of said wider channels in said support shaft fitting and in said bearing support shaft leaving a plurality of air channels therebetween, said plurality of air channels extending axially with said axle for the passage of compressed air to said tire or the venting of air from said tire;

said outer radial surface of said support shaft fitting and said inner radial surface of said bearing support shaft being curvilinear in profile, where said curvilinear profile minimizes bending stresses and potential for fracturing at said outer radial surface of said support shaft fitting and said inner radial surface of said bearing support shaft;

annular pole tips being in connection with or formable on said bearing support shaft or said support shaft fitting or said annular pole blocks or said axle;

an annular clearance gap with a ferrofluid filled therein;

said annular clearance gap disposed between said annular pole blocks and said annular pole tips in connection with or formable on said bearing support shaft or said support shaft fitting or said axle and between said annular pole tips in connection with or formable on said annular pole blocks and said bearing support shaft or said support shaft fitting or said axle;

an annular magnetic flux generated from said fixed annular magnet fitted about said axle having a continuous magnetic flux path through said fixed annular magnet and said annular pole blocks and said ferrofluid in said annular clearance gap and said annular pole tips and said bearing support shaft and said support shaft fitting and said axle, where said annular magnetic flux operates in said continuous magnetic flux path and is concentrically disposed about and within said axle;

said outer radial surface of said support shaft fitting and said inner radial surface of said bearing support shaft being highly polished to reduce air friction, whereby said reduced air friction further increases said air flow capacity in said plurality of air channels and further reduces the inflation time, and

said outer radial surface of said support shaft fitting and said inner radial surface of said bearing support shaft are provided with a low friction surface coating to non-bearing portions of said surfaces to reduce air friction, whereby said reduced air friction further increases said air flow capacity in said plurality of air channels and further reduces said inflation times.

5,587,699

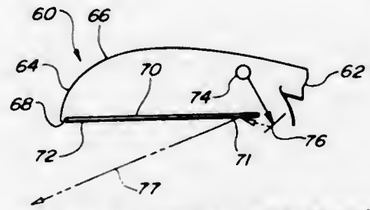
EXTERIOR MIRROR WITH INFORMATION DISPLAY

Michael D. Faloon, Northville, Mich.; William Perry, Palestine, Ohio, and Arthur Hess, Troy, Mich., assignors to United Technologies Automotive Systems Inc., Dearborn, Mich.

Filed Nov. 3, 1994, Ser. No. 333,891

Int. Cl.[6] B60Q *1/34*

U.S. Cl. 340—475 **6 Claims**



1. A mirror apparatus mounted on a vehicle for providing a reflective view and for projecting light comprising:

a housing mounted on said vehicle

a light source for selectively generating light;

a mirror glass providing a reflective view, said mirror glass mounted in said housing, said mirror glass having a display section, said display section reflecting said light from said light source;

said light source positioned in front of said mirror glass and directing light at an angle relative to said mirror glass such that the light is visible to a second observer adjacent said vehicle, but a first observer inside said vehicle cannot see said light.

5,587,700

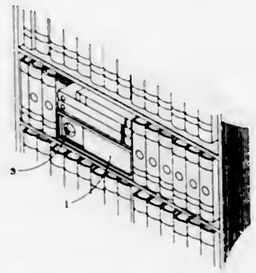
PORTABLE SECURITY ALARM UNIT

Thomas Williams, R.R. #1, Box 110, West Danville, Vt. 05873

Filed Aug. 29, 1994, Ser. No. 297,374

Int. Cl.[6] G08B *13/00*

U.S. Cl. 340—541 **24 Claims**



10. A portable security alarm unit comprising:

a. a rectangular shaped hollow housing component with a right lateral walling portion joined to a posterior walling portion, a left lateral walling portion joined to said posterior walling portion, said right lateral walling and said left lateral walling joined separately to a frontal walling portion, all of said walling portions joined to a roof and all of said walling portions joined to flooring;

b. control electronics positioned within said housing component;

c. wiring leading from said control electronics through a hole in any one of said walling portions or said roof or said flooring of said housing component to an outside power source;

d. a battery positioned within said housing component;

e. wiring leading from said control electronics to said battery;

f. a programmable keyboard built into said frontal walling portion of said housing component;

g. wiring leading from said control electronics to said programmable keyboard;

h. a body heat detection sensor having a sensor eye built into said frontal walling of said housing component positioned adjacent to the locus of said programmable keyboard;

i. wiring leading from said control electronics to said body heat detection sensor;

j. a plurality of external contacts affixed to one of said walling portions or said flooring or said roof or said housing component;

k. wiring leading from said control electronics to each of said external contacts;

l. an alarm unit capable of generating noise connectable by wiring to one of said external contacts;

m. wiring leading from one of said external contacts to said alarm unit;

n. a frontally projecting overhang with length equal to the length of said frontal walling portion which said frontally projecting overhang is an extension of said roof of said housing component;

o. a frontally projecting shelf with length equal to the length of said frontally projecting overhang which said frontally projecting shelf is an extension of said flooring of said housing component;

p. a first notch cut into said frontally projecting overhang with breadth less than the breadth of said frontally projecting overhang and running in a straight line parallel to the positional lie of the plane containing the whole of said frontal walling portion for a distance equal to the whole of the length of said frontally projecting overhang;

q. a second notch cut into said frontally projecting shelf with breadth less than the breadth of said frontally extending shelf and running in a straight line parallel to the said positional lie of the said plane containing the whole of said frontal walling portion for a distance equal to the whole of the length of said frontally projecting shelf;

r. a positioning of said first notch and said second notch such that each said notch is in the same plane, to wit, a plane positioned parallel to said plane containing the whole of said frontal walling portion;

s. a slidable panel insertable into said first notch and said second notch together with panel breadth less than the said breadth of said first notch and less than the said breadth of said second notch and panel height equal to approximately the vertical distance from the top side of said first notch to the bottom side of said second notch and panel length equal to at least the horizontal span of the eye of said body heat detection sensor;

t. a temperature sensor connected by wiring to one of said external contacts;

u. an automatic voice dialer connected by wiring to one of said external contacts.

5,587,701

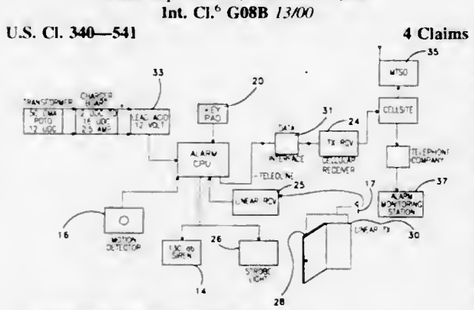
PORTABLE ALARM SYSTEM

Brian K. Hess, 403 Aylesbury Dr. South, Westerville, Ohio 43081

Filed Sep. 9, 1994, Ser. No. 303,950

Int. Cl.[6] G08B *13/00*

U.S. Cl. 340—541 **4 Claims**



1. An alarm device, comprising:

a single portable enclosure, said enclosure including a handle to enable a person to carry said enclosure by hand;

a user interface control panel secured within said enclosure, wherein said interface control panel is accessible to a user of said alarm device;

a microprocessor board installed within said enclosure, said board in communication with said interface control panel;

a signal receiver installed within said enclosure, said receiver in communication with said microprocessor board, and wherein said receiver receives signals from at least one zone within a structure being monitored;

a communication circuit secured within said enclosure, and independent of any hard wired telephone lines connected to said structure, said communication circuit adapted to initiate a telephone call to a location apart from said structure;

an audio siren connected to said microprocessor board, wherein said siren is electrically connected to said microprocessor board so as to sound when a signal is received at said signal receiver indicating said zone of said structure has been breached; and

a data interface electrically connected to said communication circuit and said microprocessor board for communicating a signal to said communication circuit from said microprocessor board to cause said communication circuit to initiate a telephone call.

5,587,702

PADLOCK WITH TAMPER ALARM

Garth R. Chadfield, Riverbank Road, RD 3, Wanganui, New Zealand

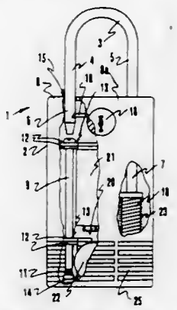
PCT No. PCT/NZ93/00112, § 371 Date May 11, 1995, § 102(e) Date May 11, 1995, PCT Pub. No. WO94/11603, PCT Pub. Date May 26, 1994

PCT Filed Nov. 12, 1993, Ser. No. 433,482

Claims priority, application New Zealand, Nov. 12, 1992, 245107; Apr. 6, 1993, 247352

Int. Cl.[6] E05B *45/06*

U.S. Cl. 340—542 **20 Claims**



1. A padlock comprising a shackle and a body, the shackle having an end releasably securable in the body, the body having a casing which is divided into two portions, each of which comprises substantially half the casing, the casing housing a tamper alarm means and a lock means, the tamper alarm means including a power supply means, the casing having an aperture configured and arranged to receive the end of the shackle, the end of the shackle being securable in the aperture by way of the locking means, one of the casing portions being removable to enable access to the power supply means, the removable portion being held in place by a retaining means, the retaining means only being accessible for retaining or releasing the removable portion of the casing via the aperture in the casing configured and arranged to receive the end of the shackle, the removable portion of the casing being configured and arranged so as to avoid indicating the location within the padlock body of the power supply means.

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5,587,703

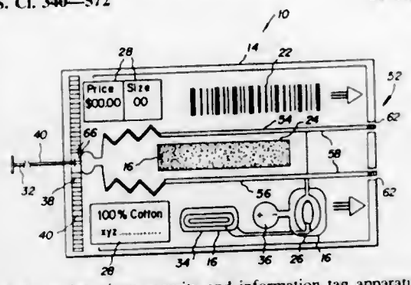
UNIVERSAL MERCHANDISE TAG

Charles Dumont, 8925 Collins Ave., Surfside, Fla. 33154

Continuation-in-part of Ser. No. 328,683, Oct. 25, 1994. This application Apr. 10, 1995, Ser. No. 419,434

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—572 **10 Claims**



4. A purchase item security and information tag apparatus for attachment to a purchase item in a store, comprising:

a tag body,

purchase item information display means for retaining item data in machine readable form,

a tag engagement security means including an elongate item engaging member which sounds an alarm if cut away from the item by a customer,

wherein said tag engagement security means comprises an electrically conductive item engaging member configured as a loop for extending through part of a purchase item and forming part of an electric circuit comprising alarm means and a power source, such that opening said circuit by breaking said engaging member prior to deactivation sounds said alarm means,

and wherein said tag engagement security means comprises deactivation means including a control wire provided within a wire guide means in said tag body, said guide means opening as a port in said tag body, said control wire making contact with said circuit when slid along said wire guide means and away from said port, such that said wire forms a short in said circuit diverting current away from said engaging member, such that said engaging member can be cut without opening said circuit.

5,587,704

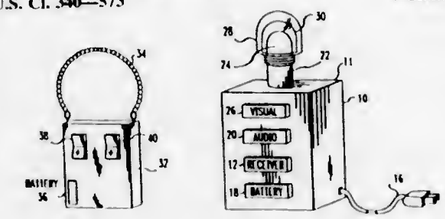
CODE BLUE LIGHT AUDIO AND VISUAL ALARM APPARATUS

Samuel T. Foster, 124 Belshaw Ave., Shrewsbury Township, Monmouth County, N.J. 07724

Filed Sep. 1, 1995, Ser. No. 523,078

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—573 **7 Claims**



1. Alarm apparatus comprising:

an electrical wall outlet providing a source of electrical energy;

first means for generating an audible alarm-signal;

second means for generating a visual alarm-signal;

third means, including a radio receiver, for coupling said electrical energy to said first and second signal-generating means;

fourth means worn by a user for generating a trigger signal, and including a remote control transmitter and a manually operable switch;

with said radio receiver being normally inoperative to disconnect said source of electrical energy from said first and second alarm-signal generating means and being responsive to the generation of said trigger signal from said fourth means for connecting said source of electrical energy to said first and second alarm-signal generating means for turning on both said audible and visual alarm-signals; and

wherein said second means is set in a prominent window at the user's location and includes means for generating a flashing light when energized;

wherein said fourth means also includes a second manually operable switch for generating a second trigger signal, and wherein said radio receiver is responsive to said second trigger signal to connect said source of electrical energy only to said second alarm-signal generating means to only turn-on said visual alarm-signal.

5,587,705

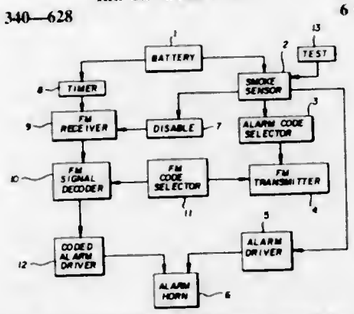
MULTIPLE ALERT SMOKE DETECTOR

Gary J. Morris, 2026 Glenmark Ave., Morgantown, W. Va. 26505

Filed Aug. 29, 1994, Ser. No. 297,403

Int. Cl.[6] G08B *17/10*

U.S. Cl. 340—628 **6 Claims**



1. A multiple alert smoke detection system comprising:

(a) a minimum of two multiple alert smoke detectors, each detector comprising sensor means for sensing the presence of smoke, each detector comprising an audible alarm;

(b) each detector comprising means for actuation of said audible alarm for the duration of the sensor means sensing of the smoke;

(c) each detector comprising means for wireless direct communication with other smoke detectors of said system, each detector comprising a transmitter for transmitting user selectable, coded frequency modulated radio signal transmission, each smoke detectors comprising user selectable, coded frequency modulated radio receiver each detector emitting an audible pattern defined by the radio signal received by the detector.

5,587,706

METHOD AND APPARATUS FOR POWER OFF CONTROL OF A SELECTIVE CALL RADIO

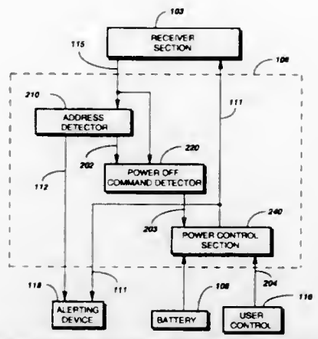
Donald L. Branner, Coral Springs; Andrew E. Ray, Delray Beach; Scott M. Peters, Coral Springs, and Richard M. Huber, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1994, Ser. No. 333,687

Int. Cl.[6] G08B *5/22;* **H04B** *7/00*

U.S. Cl. 340—825.44 **5 Claims**

1. A selective call radio, comprising:



a receiver section for receiving and demodulating a radio signal when power is supplied thereto, wherein the radio signal includes an address;

an address detector, coupled to said receiver section, wherein said address detector is for comparing the address demodulated by the receiver section to at least one selective call address stored in the selective call radio, and for generating an address detect signal when the address matches one of the at least one selective call address within predetermined parameters;

an alerting device, coupled to said address detector, for generating a sensible alert in response to the address detect signal;

a power off command detector, coupled to said address detector and said receiver section, for generating a power off signal when the address detect signal is generated and the radio signal includes a power off command; and

a power control section, coupled to said power off command detector, wherein said power control section is arranged such that it is responsive only to the power off signal for changing a state of the selective call radio to an off state, and wherein when said selective call radio is in the off state, essentially no power is supplied to said receiver section and said alerting device is disabled.

5,587,707

DATA TRANSFER

Neil M. Dickie, and Steven M. Hudson, both of Dorset, United Kingdom, assignors to Flight Refuelling Limited, Dorset, United Kingdom

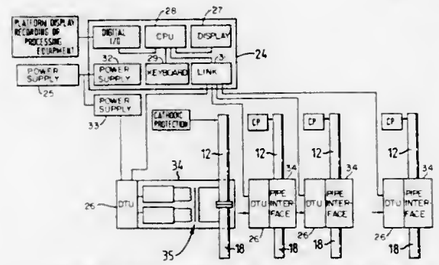
PCT No. PCT/GB93/01272, § 371 Date Dec. 13, 1994, § 102(e) Date Dec. 13, 1994, PCT Pub. No. WO93/26115, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 15, 1993, Ser. No. 351,457

Claims priority, application United Kingdom, Jun. 15, 1992, 9212685

Int. Cl.[6] G08B *19/00;21/00*

U.S. Cl. 340—870.09 **16 Claims**



1. A pipeline system comprising a metal pipeline having a coating of insulating material which, in conjunction with sacrificial anodes electrically connected to the pipe provides cathodic protection, there being signal generating means adapted to be coupled to the pipeline and operable when so coupled to apply data to be transmitted in signal form to the pipeline for conveying along an electrically conducting channel formed by the metal pipeline, wherein the improvement comprises the signal generating means being operable to generate as the signal a pulsed electro-magnetic signal which comprises changes of voltage level in a very low frequency range (VLF and below), and further including means operable to use data transmitted via the channel provided by the pipeline for monitoring the condition of the insulation of the pipeline.

5,587,708

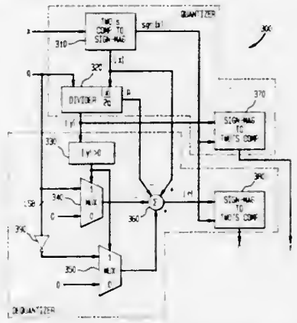
DIVISION TECHNIQUE UNIFIED QUANTIZER-DEQUANTIZER

Chung-Yen Chiu, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Jan. 19, 1994, Ser. No. 184,368

Int. Cl.[6] H03M *2/36*

U.S. Cl. 341—76 **10 Claims**



1. A process for quantizing and dequantizing an input digital signal x to produce a quantized coefficient signal y and a reconstructed (dequantized) signal r, comprising the steps of:

inputting into a quantizer circuit an input signal x and a half quantization step size q,

outputting from said quantizer circuit a quantized coefficient signal y and a remainder R, where:

$$|y| = \left\lfloor \frac{|x|}{2q} \right\rfloor \text{ and } R = |x| - \left\lfloor \frac{|x|}{2q} \right\rfloor$$

and

inputting into to an adder and conversion circuit a magnitude |x| of the input digital signal, a remainder R, q when $y \neq 0$, and 1 when $y \neq 0$ and q is even;

outputting from an adder and conversion circuit, a reconstructed signal r where:

$$r = \mathrm{sgn}(x) \cdot \left(|x| - \begin{cases} R & \text{if } y = 0 \\ (R - q) & \text{if } y \neq 0 \ \ q \text{ is odd} \\ (R - q + 1) & \text{if } y \neq 0 \ \ q \text{ is even} \end{cases} \right)$$

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5,587,709

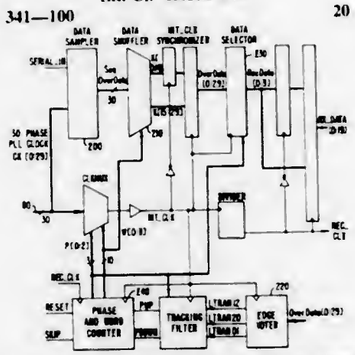
HIGH SPEED SERIAL LINK FOR FULLY DUPLEXED DATA COMMUNICATION

Deog-Kyoon Jeong, Gyosu Apt. Ga-201, Bongchun-7-Dong, Kwanak-Ku, Seoul, Rep. of Korea, assignor to Deog-Kyoon Jeong, Seoul, Rep. of Korea, and Sun Microsystems, Inc., Mountain View, Calif.

Division of Ser. No. 254,326, Jun. 6, 1994. This application Dec. 29, 1995, Ser. No. 580,571

Int. Cl.[6] H03M *9/00*

U.S. Cl. 341—100 **20 Claims**



1. A receiver for converting a serial data input stream into a parallel data output stream comprising:

a plurality of registers for receiving the serial data input stream;

a clock generator circuit for supplying a plurality of clock signals to the plurality of registers;

a sampler for detecting the state of the data in the registers in response to the clock signals, and in response, supplying output signals indicative of the data;

a data aligner connected to receive the output signals from the parallel sampler and in response thereto partition the data into words;

a voter connected to the data aligner to detect zero crossings from the data samples to find a position with the most edge transitions; and

a data separator for converting the serial data from the voter into parallel data.

5,587,710

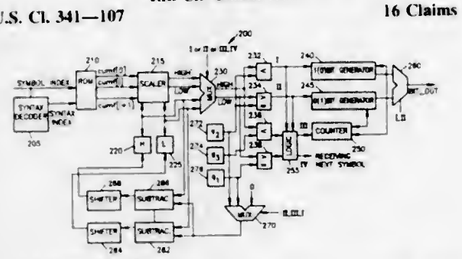
SYNTAX BASED ARITHMETIC CODER AND DECODER

Chang Y. Choo, San Jose; Xiaonong Ran, Cupertino; Christine A. Porter, San Jose, and Mohammad R. Motamedi, Palo Alto, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 24, 1995, Ser. No. 409,448

Int. Cl.[6] H03M *7/00*

U.S. Cl. 341—107 **16 Claims**



1. A coder comprising:

a memory which, in response to receiving a symbol index, asserts a signal that indicates the boundaries of a segment that corresponds to the symbol index and results from applying an arithmetic coding model to a first interval;

a register which indicates the boundaries of a second interval;

a scaling circuit coupled to the memory and the register, wherein the scaling circuit transforms the signal asserted by the memory to first and second digital signals indicating the boundaries of a segment of the second interval; and

a signal generator which generates an output bit when a most significant bit of the first digital signal equals a most significant bit of a second digital signal.

5,587,711

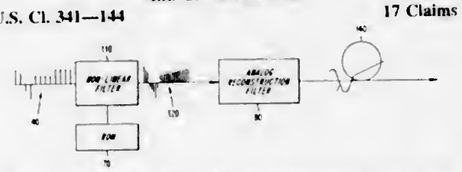
METHOD AND SYSTEM FOR RECONSTRUCTING QUANTIZED SIGNALS

Lance J. Williams, Los Altos, and Michael Kass, Aptos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1994, Ser. No. 315,637

Int. Cl.[6] H03M *1/66*

U.S. Cl. 341—144 **17 Claims**



17. A method for reconstructing an original signal from a quantized signal comprising the steps of:

sampling said quantized signal at control points wherein said step of sampling further comprises the steps of:

identifying horizontal segments of said quantized signal within which a quantization level does not change;

selecting as control points endpoints of each segment and two interior points of each segment which are evenly spaced from one another and from said endpoints; and

solving for amplitude values at said selected control points a system of equations constraining cubic polynomial segments to the range of their quantization bounds and minimizing the integral of the second derivative of the solution;

interpolating said control points to transform said quantized signal into a dequantized signal; and

reconstructing said original signal from said dequantized signal.

5,587,712

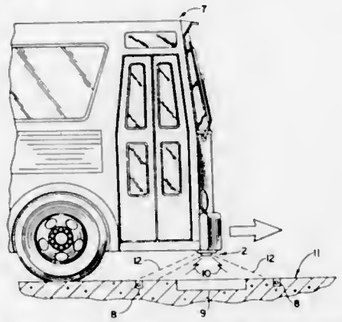
TRANSPONDER HAVING MICROPROCESSOR GENERATED FREQUENCY SHIFT SIGNALS

Steven F. Boone, Wood Dale, and Edward J. Ho, Bloomingdale, both of Ill., assignors to Mark IV Transportation Products Corp., Niles, Ill.

Filed Nov. 12, 1993, Ser. No. 151,243

Int. Cl.[6] G08G *1/01*

U.S. Cl. 342—42 **6 Claims**



1. In a transponder for transmitting an electromagnetic signal based on previously stored information in said transponder, to a remote interrogating station when triggered by a signal transmitted from said station to said transponder, the improvement comprising:

a microprocessor in said transponder having a predetermined cycle time;

means programming said microprocessor for generating a first number of pulses, each said pulse having a period corresponding to a first multiple of said cycle time, said first multiple defining a first signal frequency;

means programming said microprocessor for generating a second number of pulses, said pulses occurring at a period corresponding to a second multiple of said cycle time, said second multiple defining a second signal frequency;

means generating groups of said first and second pulses, said groups defining a frequency shift keyed signal; and

means modulating said frequency shift keyed signals in accordance with said stored information, thereby generating a transponder response to said interrogating station signal and,

means in said transponder transmitting said frequency shift signals to said interrogating station.

5,587,713

RADAR TRANSMITTER/RECEIVERS

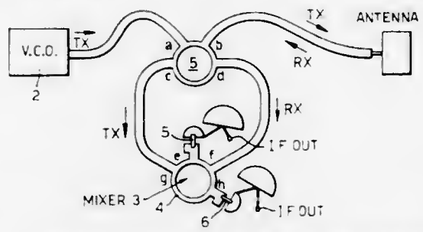
Heinz Pfizenmaier, Leonberg, Germany; Philip Blakelock; Brian Prime, both of Lincoln, United Kingdom, and David Dawson, Lincolnshire, United Kingdom, assignors to Plessey Semiconductors Limited, United Kingdom, and Robert Bosch GmbH, Germany

Filed May 17, 1995, Ser. No. 443,247

Claims priority, application United Kingdom, Jun. 1, 1994, 9410985

Int. Cl.[6] G01S *13/93;7/28*

U.S. Cl. 342—70 **4 Claims**



1. A frequency modulated, continuous wave, radar transmitter/receiver arrangement, comprising:

an electric oscillator; an antenna; mixer means; and dual rat-race coupling means including

first and second ring transmission paths each having first, second, third and fourth ports,

means coupling the second and third ports of the first ring transmission path to said oscillator and to said antenna respectively,

means coupling the first and fourth ports of the first ring transmission path to the first and third ports of the second ring transmission path respectively, and

means coupling at least one of the second and fourth ports of the second ring transmission path to said mixer means.

5,587,714

SPACECRAFT ANTENNA POINTING ERROR CORRECTION

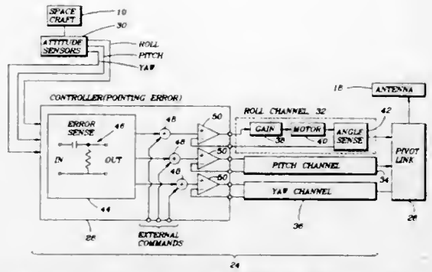
Peter Y. Chu, Palo Alto, and Alfred H. Tadros, San Jose, both of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Mar. 10, 1995, Ser. No. 401,863

Int. Cl.[6] H04B *7/185*

U.S. Cl. 342—354 **5 Claims**

1. A system for correcting the pointing error of an instrument carried by a spacecraft comprising:



means for orienting a line of sight of the instrument relative to the spacecraft;

means for sensing an orientation of the spacecraft including a perturbation in said orientation, said perturbation being characterized in a spectral domain by a band of frequencies extending from a low-frequency end of said band to a high-frequency end of said band, to a high-frequency end of said band, a transient part of said perturbation being characterized in said spectral domain by a high-frequency portion of said band;

means coupled to said sensing means for extracting a transient part perturbation in said orientation, said extracting means comprising high-pass filter means which passes the high frequency portion of said band, while attenuating low-frequency portion of said band, for extracting said transient part of said perturbation; and

compensating means responsive to said transient part of said perturbation, and operating independently of said low-frequency portion of said band, for commanding said orienting means to alter an orientation of said line of sight relative to said spacecraft by an incremental orientation equal and opposite to said transient part of said perturbation.

5,587,715

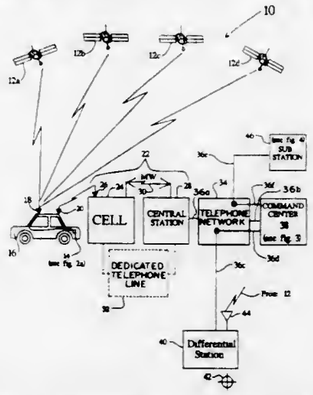
METHOD AND APPARATUS FOR TRACKING A MOVING OBJECT

Peter T. Lewis, Washington, D.C., assignor to GPS Mobile, Inc., Washington, D.C.

Filed Mar. 19, 1993, Ser. No. 36,533

Int. Cl.[6] H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **62 Claims**



1. A method of determining with a high degree of accuracy the location of an object based upon signals transmitted from a plurality of satellites disposed in known orbits about the earth, the object being capable of moving selectively throughout a geographical area, said method comprising the steps of:

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a) distributing a plurality of fixed points throughout the geographical area and determining with accuracy the location of each of the fixed points;

b) receiving at each of the plurality of fixed points and processing satellite signals from a corresponding subset of the plurality of satellites presently in sight of each fixed point to determine the approximate location of each fixed point;

c) comparing the approximate and accurate locations of each of the plurality of fixed points to provide differential data;

d) receiving at the object and processing the satellite signals from a given subset of the plurality of satellites presently in sight of the object to determine the approximate location of the object;

e) transmitting a signal indicative of the object's approximate location to a fixedly disposed command center;

f) determining based upon the received object's approximate location and the determined locations of the fixed points which of the plurality of fixed points is presently in sight of the same subset of satellites as the object;

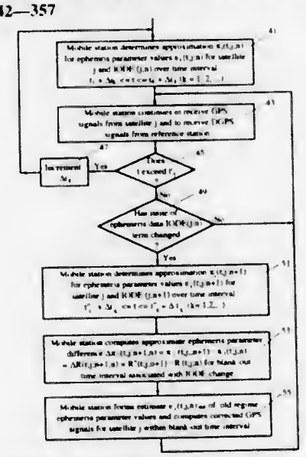
g) establishing a communication path between the command center and with at least one of said in sight fixed points; and

h) transmitting over the communication path the differential data of the determined fixed point, whereby the object's approximate location is adjusted based on the differential data of said one in sight fixed point to provide an indication of the object's location with greater accuracy.

5,587,716
GAP COVERAGE FOR GPS SIGNALS

Len Sheynblat, Belmont, Calif., assignor to Trimble Navigation, Ltd., Sunnyvale, Calif.

Filed Sep. 29, 1995, Ser. No. 537,110
Int. Cl.[6] H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **13 Claims**



1. A method for compensating for temporary loss of differential GPS correction signals for a satellite during an IODE changeover interval, the method comprising the steps of:

receiving ephemeris data for a satellite, numbered j, during two consecutive IODE time intervals, given by $t(j;n)_{IODE} \leqq t < t(j;n+1)_{IODE}$, and $t(j;n+1)_{IODE} \leqq t < t(j;n+2)_{IODE}$, when the ephemeris data are available for at least one satellite numbered j=1, . . . , J (J≧3);

receiving differential GPS correction signals for satellite number j for a time interval $t(j;n)_{IODE}+\Delta t_{ch}+\Delta t_{rev,ref} \leqq t < t(j;n+1)_{IODE}+\Delta t_{ch}+\Delta t_{rev,ref}$ based upon ephemeris data that are applicable for the IODE time interval $t(j;n)_{IODE} \leqq t < t(j;n+1)_{IODE}$ for satellite j, where Δt_{ch} is a first selected non-negative temporal length, $\Delta t_{rev,ref}$ is a second selected positive temporal length;

receiving differential GPS correction signals for satellite j for a time interval $t(j;n+1)_{IODE}+\Delta t_{ch}+\Delta t_{rev,ref} \leqq t < t(j;n+2)_{IODE}+\Delta t_{ch}+\Delta t_{rev,ref}$ based upon ephemeris data that are applicable for the time interval $t(j;n+1)_{IODE} \leqq t < t(j;n+2)_{IODE}$ for satellite j;

for two selected times $t=t'_2$ and $t=t'_3$ satisfying the constraints $t(j;n)_{IODE} < t'_2 \leqq t(j;n+1)_{IODE} < t'_3$, determining the time variation of each of l ephemeris parameters $e_i(t;j;n)$ (i=1, . . . , l; l≧1) that determine the ephemeris of satellite j during the time interval given by $t'_2 \leqq t < t'_3$;

for two selected times $t=t''_2$ and $t=t''_3$ satisfying the constraints $t(j;n+1)_{IODE}+\Delta t_{rev,msh} \leqq t''_2 < t''_3$, determining the time variation of each of l ephemeris parameters $e_i(t;j;n+1)$ (i=1, . . . , l; l≧1) that determine the ephemeris of satellite j during the time interval given by $t''_2 \leqq t < t''_3$, where $\Delta t_{rev,msh}$ is a third selected positive temporal length;

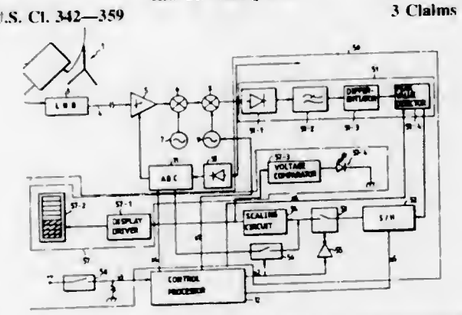
determining an approximation $\Delta\pi_i(t;j;n+1,n)$ for each of the l ephemeris parameter difference values $\Delta e_i(t;j;n+1,n)=e_i(t;j;n+1)-e_i(t;j,n)$ in a time interval that includes at least a portion of the time interval $t(j;n+1)_{IODE}+\Delta t_{rev,msh} \leqq t < t(j;n+1)_{IODE}+\Delta t_{ch}+\Delta t'_{rev,ref}$; and

estimating the values of each of the l ephemeris parameters $e_i(t;j;n)$ in at least a portion of the time interval $t(j;n+1)_{IODE}+\Delta t_{rev,msh} \leqq t < t(j;n+1)_{IODE}+\Delta t_{ch}+\Delta t_{rev,ref}$ by the approximation $e_i(t;j;n)_{est}=e_i(t;j;n+1)-\Delta\pi_i(t;j;n+1,n)$.

5,587,717
MANUAL ANTENNA ALIGNMENT APPARATUS AND METHOD FOR VERY SMALL APERTURE TERMINAL

Yong J. Jang, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Sep. 12, 1995, Ser. No. 526,890
Claims priority, application Rep. of Korea, Dec. 30, 1994, 94-39847
Int. Cl.[6] H01Q *3/00*
U.S. Cl. 342—359 **3 Claims**



1. An apparatus for manually aligning an antenna of a very small aperture terminal with a satellite, comprising manual antenna alignment means connected between a demodulator and a data processor in a receiver, for aligning said antenna with said satellite, said manual antenna alignment means including:

peak value detection means for filtering and differentiating an output signal from said demodulator to detect a peak value therefrom in response to a peak value detection control signal from a control processor, the detected peak value indicating a frequency position of a carrier transmitted from a center communication station;

a sample/holder for sampling and holding an output signal from said peak value detection means in response to a sample/hold control signal from said control processor;

an inverter for inverting a multiplexing control signal from said control processor;

a first analog switch for selectively transferring an output signal from said sample/holder in an antenna alignment mode in response to an output signal from said inverter;

a second analog switch for selectively transferring an output signal from an automatic gain control circuit in said receiver in a normal mode in response to the multiplexing control signal from said control processor;

a scaling circuit for scaling the output signal from said sample/holder transferred by said first analog switch or the output signal from said automatic gain control circuit transferred by said second switch at a desired ratio;

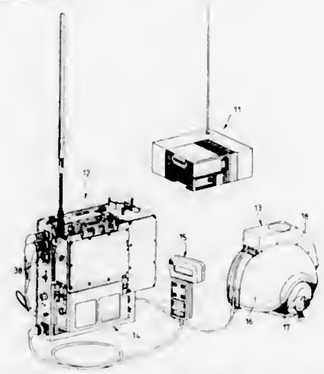
signal display means for displaying a level of an output signal from said scaling circuit so that it can be observed by the user with the naked eye; and

an antenna alignment mode switch for selecting the antenna alignment mode.

5,587,718
METHOD FOR DISCOVERING AND DESIGNATING AIR TARGETS

Carlo A. Iardella, Carrara, and Mauro Agrusa, La Spezia, both of Italy, assignors to GF-OTO Melara Breda Bresciana S.r.l., Rome, Italy

Filed Jun. 16, 1994, Ser. No. 260,817
Claims priority, application Italy, Jun. 16, 1993, MI93A1290
Int. Cl.[6] G01S *5/04;* **F41G** *5/12*
U.S. Cl. 342—443 **2 Claims**



1. A method for automatically discovering and designating targets for an operator of a weapons system, comprising:

(a) automatically scanning for existence and location of a target and thereby acquiring signals indicative of existence and location of the target;

(b) transmitting signals indicative of existence and location of a target, to a portable receiver that is collocated with a weapons system operator who is wearing a headset unit which includes stereophonic headphones operatively connected with the receiver, so that the operator receives audio signals, including digitized voice signals, which vary depending on the existence and location of the target as well as on spatial orientation of the headset unit;

(c) the operator orienting his or her head towards a direction in which the weapons system is to be fired at said target by moving so as to achieve a predetermined modification of said audio signals, including digitized voice signals;

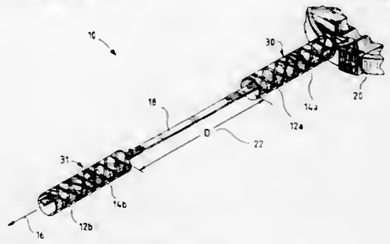
(d) while conducting steps (a) and (b), acquiring signals indicative of existence and location of a higher priority target and transmitting signals indicative of existence and location of said higher priority target to said receiver; and

(e) the operator interrupting step (c) by rapid large-scale head rotation in response to audio signals received in step (d), and then conducting step (c) in regard to the audio signals received in step (d), for orienting their head towards the direction in which the weapons system is to be fired at said higher priority target.

5,587,719
AXIALLY ARRAYED HELICAL ANTENNA

David A. Steffy, Herndon, Va., assignor to Orbital Sciences Corporation, Dulles, Va.

Filed Feb. 4, 1994, Ser. No. 191,247
Int. Cl.[6] H01Q *1/36;11/08*
U.S. Cl. 343—895 **10 Claims**



3. An antenna system comprising:

a plurality of antenna structures which include at least one antenna element having at least one conductive element helically wound in a first direction around a common axis, said antenna structures being arrayed axially spaced from one another along said common axis;

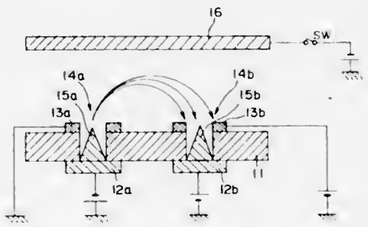
feeding means for feeding a common signal to each of said antenna elements, said feeding means comprising phase shifting means for shifting the phase of said common signal with respect to each of said antenna elements; and

wherein said antenna elements are quadrifilar helical antennas having four orthogonal conductive elements helically wound around said common axis.

5,587,720
FIELD EMITTER ARRAY AND CLEANING METHOD OF THE SAME

Shinya Fukuta, and Keiichi Betsui, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 971,618, Nov. 6, 1992, abandoned. This application Jul. 19, 1994, Ser. No. 277,351
Claims priority, application Japan, Nov. 8, 1991, 3-293343
Int. Cl.[6] G09G *3/10*
U.S. Cl. 345—75 **15 Claims**



1. A method for cleaning a field emitter array that includes an electron-beam source array formed by arranging a plurality of electron-beam source elements, each of said electron-beam source elements including a cathode for emitting electrons and a gate provided in the vicinity of said cathode, a predetermined cathode voltage being applied to said cathode and a predetermined gate voltage being applied to said gate, to emit electrons from said cathode by field emission effect in a first mode of operation of the field emitter array, and an anode arranged facing said electron-beam source elements in proximity to said cathode of each of said electron-beam source elements, applied with a predetermined positive voltage for capturing said electrons emitted from at least one

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cathode of said electron-beam source elements in the first mode of operation of the field emitter array, said method comprising the steps of:

(a) forming an electron beam in a second mode of operation such that the electron beam exists between a cathode pair in a pair of said electron-beam source elements in said electron-beam source array by applying a predetermined excitation voltage between said cathode pair; and

(b) applying a predetermined negative voltage to said anode in place of said predetermined positive voltage in the second mode of operation of the field emitter array, substantially concurrently with said forming in step (a).

5,587,721

LIQUID CRYSTAL DRIVING APPARATUS

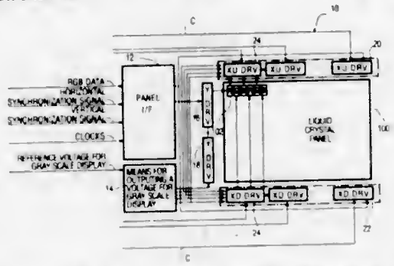
Atsushi Koiwa, Kawasaki, Japan, assignor to International Business Machines Corporation

Filed Dec. 27, 1994, Ser. No. 364,167

Claims priority, application Japan, Dec. 28, 1993, 5-337281

Int. Cl.[6] G09G *5/10*

U.S. Cl. 345—89 **1 Claim**



1. Apparatus for driving a gray scale liquid crystal display panel from gray scale display data representing the gray scale level to be displayed by each liquid crystal cell of the liquid crystal display panel, irrespective of whether said gray scale liquid crystal display panel requires gray scale input in the form of a variable voltage amplitude signal or in the form of a variable pulse width signal, said apparatus comprising:

means for generating a gray scale display voltage corresponding to said each liquid crystal cell, said gray scale display voltage having an amplitude corresponding to the gray scale display data for said each liquid crystal cell;

a signal conversion means for converting said gray scale display voltage to a gray scale display pulse corresponding to said each liquid crystal cell, said gray scale display pulse having a pulse width corresponding to the amplitude of the gray scale display voltage for said each liquid crystal cell; and

a switching means for selecting and applying to said each liquid crystal cell either said gray scale display voltage or said gray scale display pulse depending upon whether said gray scale liquid crystal panel requires gray scale input in the form of a variable voltage amplitude signal or in the form of a variable pulse width signal respectively.

5,587,722

ACTIVE MATRIX DISPLAY DEVICE

Yoshio Suzuki, and Yoshiharu Nakajima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

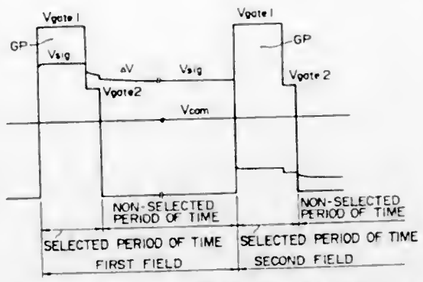
Filed Jun. 16, 1993, Ser. No. 77,041

Claims priority, application Japan, Jun. 18, 1992, 4-184408

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—94 **2 Claims**

1. An active matrix display device comprising:



a plurality of display elements arranged in a matrix, each of which display elements comprising a pixel which comprises opposed electrodes with electro-optical material therebetween, and a transistor for driving the pixel and having a gate electrode;

means for providing gate pulses sequentially to the gate electrode during a selected period of time to apply video signals to each pixel; and means for shaping the fall of the gate pulses into a step-wise shape.

5,587,723

DISPLAY RANGE CONTROL APPARATUS AND EXTERNAL STORAGE UNIT FOR USE THEREWITH

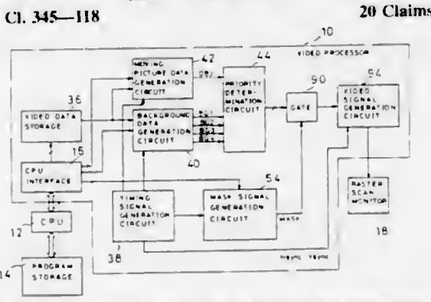
Masahiro Otake, Kyoto; Toyofumi Takahashi, Tokyo; Satoshi Nishiumi, Kyoto, and Takashi Otsuki, Tokyo, all of Japan, assignors to Nintendo Co., Ltd., Kyoto, and Ricoh Co., Ltd., Tokyo, both of Japan

Continuation of Ser. No. 792,196, Nov. 13, 1991, abandoned. This application Apr. 13, 1994, Ser. No. 226,891

Claims priority, application Japan, Nov. 17, 1990, 2-312410

Int. Cl.[6] G09G *1/16*

U.S. Cl. 345—118 **20 Claims**



1. A display control apparatus for displaying a picture on a screen of a raster scan monitor while masking a portion of said screen, said control apparatus comprising:

a position data output device for generating position data representing two points in a horizontal direction on said screen;

means for changing the position data of the two points between two or more horizontal lines on said screen;

a picture data generator for generating picture data including means for generating moving object picture data and means for generating background picture data;

a priority circuit for receiving the moving object and background picture data and selectively transmitting the picture data having a higher priority when the moving object and background picture data overlap;

a mask signal generator for generating a mask signal in accordance with said position data during horizontal scanning of said raster scan monitor;

a logic gate connected to said priority circuit and said mask signal generator for gating said picture data received from said priority circuit in accordance with said mask signal; and

a video signal generator for converting the picture data gated by said logic gate into a video signal compatible with said raster scan monitor,

wherein said means for changing changes the shape of the masked screen portion by changing the position data of the two points between two or more horizontal lines on said screen.

5,587,724

PORTABLE TERMINAL DEVICE

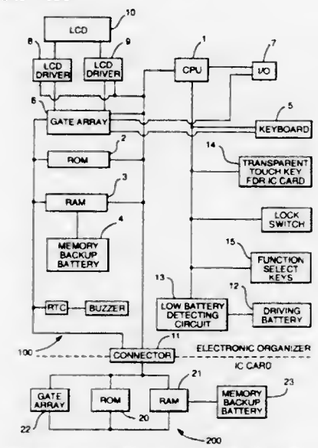
Eichika Matsuda, Yamatotakada, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1992, Ser. No. 892,316

Claims priority, application Japan, Jun. 6, 1991, 3-135134

Int. Cl.[6] G06F *15/00*

U.S. Cl. 345—156 **5 Claims**



1. A multiple memorandum information portable terminal device, comprising:

input means for receiving information items in a registration mode and for receiving data in a subsequent input mode, respectively input by an operator;

display means for displaying operator guidance prompts corresponding to said information items in a subsequent input mode;

memory means for registering in the registration mode a plurality of said information items relating to a plurality of different types of memorandum functions including at least calendar, schedule, telephone directory, clock, and calculation functions;

selecting means for selecting a memorandum function from said plurality of different kinds of memorandum functions registered in said memory means; and

control means for repeating alternately a display operation and a data receiving operation, said display operation displaying an operator guidance prompt corresponding to an information item of a selected memorandum function, said data receiving operation receiving data input by the operator through said input means in the input mode in response to the operator guidance prompt, said input data being stored in connection with said information item, based on an order in which said plurality of information items are registered by an operator in said memory means.

5,587,725

FONT DATA COMPRESSION METHOD IN A CHARACTER GENERATOR

Ei Sakanishi, Hachioji, and Kiyoshi Kitahara, Naritahigashi, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 699,615, May 15, 1991, abandoned. This application Sep. 13, 1994, Ser. No. 304,972

Claims priority, application Japan, May 18, 1990, 2-126779

Int. Cl.[6] G09G *5/24*

U.S. Cl. 345—195 **7 Claims**

THE RELATION BETWEEN THE COMPRESSION INFORMATION AND COMPRESSION PROCESSING

VALUES OF COMPRESSION INFORMATION 1 7 6 5 4 3 2 1 0 B1	CONTENTS OF COMPRESSION INFORMATION	COMPRESSION INFORMATION 2
(0 0 0 0 * * * *)	(WHOLE WIDTH DATA WITHOUT COMPRESSION)	NON-EXISTENCE
0 0 0 1 * * * *	REPETITIVE COMPRESSION	NON-EXISTENCE
0 0 1 0 * * * *	MIRROR COMPRESSION	NON-EXISTENCE
1 0 0 0 * * * *	RIGHT-AND-LEFT COMPRESSION	EXISTENCE
1 0 0 1 * * * *	INTER RIGHT-AND-LEFT COMPRESSION	EXISTENCE
1 0 1 0 * * * *	INTER RIGHT-AND-LEFT COMPRESSION MIRROR	EXISTENCE
1 1 0 0 * * * *	RIGHT-AND-LEFT LINKAGE COMPRESSION	EXISTENCE
1 1 0 1 * * * *	INTER RIGHT-AND-LEFT LINKAGE COMPRESSION REPETITION	EXISTENCE
1 1 1 0 * * * *	INTER RIGHT-AND-LEFT LINKAGE COMPRESSION MIRROR	EXISTENCE
1 1 1 1 * * * *	NO DATA	NON-EXISTENCE

1. A font data compressing method in a character generator, comprising the steps of:

(a) defining a plurality of regeneration rules for a plurality of font patterns;

(b) selecting a specific regeneration rule to be applied to a font pattern to be compressed from said regeneration rules defined in step (a) and storing said specific regeneration rule in said character generator, said specific regeneration rule being in one-to-one relation to the font pattern to be compressed;

(c) storing a bit formation for forming a part of dot matrix data representing a whole configuration of said font pattern in accordance with said specific regeneration rule selected in step (b), said bit formation representing at least one column of said dot matrix data; and

(d) automatically regenerating said dot matrix data representing the whole configuration of said font pattern based on said bit formation stored in step (c) and said specific regeneration rule selected and stored in said character generator in step (b), wherein

said bit formation comprises specific bit patterns adjacent to each other in said dot matrix, said font pattern to be compressed is formed by said bit formation and a mirror image of said bit formation, and said dot matrix data is regenerated in said step (d) by outputting first said specific bit patterns of said bit formation and then bit patterns corresponding to the mirror image of said bit formation obtained with the last bit pattern of said bit formation serving as an axis of symmetry.

5,587,726

METHOD AND APPARATUS FOR INCREASING THE SPEED OF OPERATION OF A DOUBLE BUFFERED DISPLAY SYSTEM

Guy Moffat, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 914,991, Jul. 16, 1992, abandoned, which is a continuation of Ser. No. 632,016, Dec. 21, 1990, abandoned. This application Oct. 6, 1994, Ser. No. 319,474

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—201 **10 Claims**

1. A double-buffered frame buffer system for writing to an output display comprising:

a first bank of two-ported video random access memory for furnishing portions of a first frame of information to the output display through its first port and for concurrently receiving information through its second port to update lines in a second frame of information not being currently furnished to the output display, wherein each frame includes all lines of a complete display image, such that said first and

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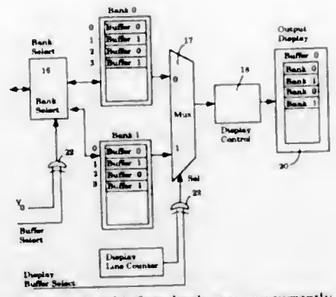


second ports of said first bank are concurrently used for receiving and outputting information;

a second bank of two-ported video random access memory for furnishing all remaining portions of said first frame of information to the output display through its first port and for concurrently receiving information through its second port to update lines in said second frame of information not being currently furnished to the output display such that said first and second ports of said second bank are concurrently used for receiving and outputting information;

said first and second banks simultaneously storing all information corresponding to said first frame and portions of said second frame;

means for alternatively addressing said first and second banks of memory as each line in said first frame is written to the output display, said first frame having its lines interleaved between said first and second banks of said memory;

means for addressing said first and second banks of memory to write information to update lines in said second frame not being currently furnished to the output display, said second frame having its lines interleaved between said first and second banks of said memory; and

means for controlling the writing of lines in said first frame of information to the output display by selecting alternate lines constituting said first frame from said first bank and said second bank.

5,587,727

INK JET APPARATUS USING PRESSURE WAVE INTERSECTION TO EJECT INK DROPLETS

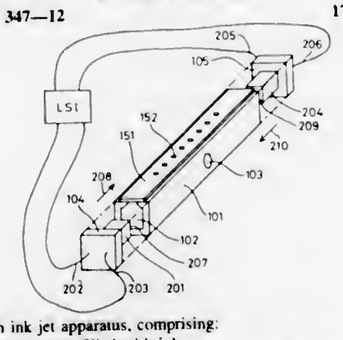
Hiroto Sugahara, Ama-gun, and Yoshikazu Takahashi, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 4, 1994, Ser. No. 222,594

Claims priority, application Japan, Apr. 23, 1993, 5-097468; Jun. 1, 1993, 5-130282

Int. Cl.[6] B41J *29/38*

U.S. Cl. 347—12 **17 Claims**



1. An ink jet apparatus, comprising:

an ink chamber filled with ink;

a plurality of jet nozzles communicating with said ink chamber;

energy generating means for generating pressure waves in the ink contained in said ink chamber to jet the ink from said jet nozzles;

energy control means for controlling said energy generating means to generate the pressure waves so that one of the pressure waves generated by said energy generating means is synthesized with another one of the pressure waves generated by said energy generating means to thereby jet the ink from subject jet nozzle of said plurality of jet nozzles.

5,587,728

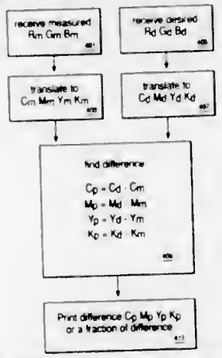
OPTICAL FEEDBACK PRINTER

Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1994, Ser. No. 235,847

Int. Cl.[6] B41J *29/393;2/21*

U.S. Cl. 347—19 **23 Claims**



1. A method for printing an image on a substrate comprising the steps of:

scanning an image on a substrate, wherein a set of pixels of the scanned image has an intensity less than a desired image intensity for a corresponding set of pixels in a desired image; and

printing a set of correction pixels on the substrate, wherein each correction pixel is printed according to a difference between image intensities of corresponding scanned and desired image pixels.

5,587,729

ROTATABLE SERVICE STATION FOR INK-JET PRINTER

Ghai K. Lee, Singapore, Singapore, and Masao Gomi, Suwa, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 11, 1993, Ser. No. 59,402

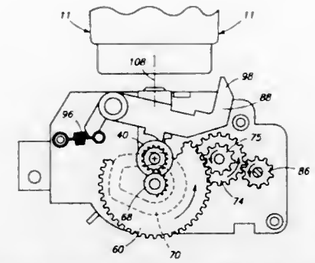
Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—32 **10 Claims**

1. An apparatus for servicing a pen that is installed in a printer for movement between a printing position and a service position, the apparatus comprising:

a service station located at the service position, the service station having a rotatable carrier with a capping member and a wiper mounted thereon; and

a carrier drive subsystem having a driven gear mounted on a displaceable carrier axle that is connected to the carrier, a drive gear, and a cam surface formed on the drive gear, the carrier axle being engaged with and displaceable by the cam surface, the cam surface having a first cam track portion to position the carrier axle in an engaged proximity where the driven gear mounted on the carrier axle engages the drive gear to rotate the rotatable carrier of the service station to position



the capping member and the wiper adjacent to the pen and a second cam track portion to displace the carrier axle to a disengaged proximity where the driven gear is disengaged from the drive gear and the service station is moved along a linear path to selectively cover and uncover the pen with the capping member.

5,587,730

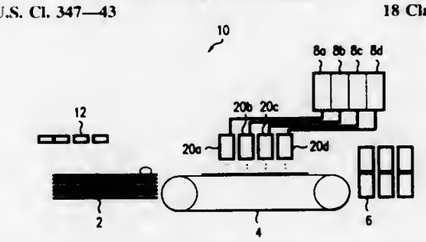
REDUNDANT FULL WIDTH ARRAY THERMAL INK JET PRINTING FOR IMPROVED RELIABILITY

Robert S. Karz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1994, Ser. No. 316,142

Int. Cl.[6] B41J *2/21;29/38*

U.S. Cl. 347—43 **18 Claims**



1. A thermal ink jet printer operates in a first mode or a second mode comprising:

primary printing means for printing ink drops of a first color; and

secondary printing means for printing ink drops of at least said first color, said secondary printing means selectively printing according to said first mode or said second mode, wherein said secondary printing means in said first mode operates simultaneously with said primary printing means to supplement said primary printing means, and wherein if said primary printing means fails, said secondary printing means in said second mode prints ink drops of said first color in place of said primary printing means.

5,587,731

INK RETAINER

Kuniaki Yasunaga, and Shigeru Ueno, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

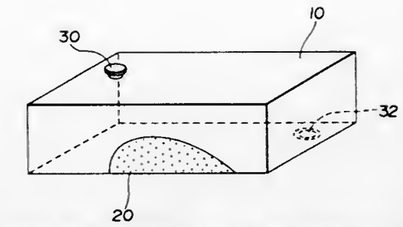
Filed Feb. 22, 1994, Ser. No. 199,653

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—86 **4 Claims**

1. An ink retainer comprising a flexible polyurethane foam which is prepared by reacting a polyether polyol with a polyisocyanate,

wherein said polyether polyol comprises a polymeric polyol, wherein at least one of styrene and acrylonitrile is grafted to said polymeric polyol, wherein said polymeric polyol is present in an amount of at least 20% by weight based on the total weight of said polyether polyol,



wherein said polyurethane foam is a three-dimensional reticulated foam which contains at least 20 cells/inch and which has no cell membranes, and

wherein said polyurethane foam absorbs and retains ink.

5,587,732

COLOR THERMAL PRINTING METHOD AND APPARATUS

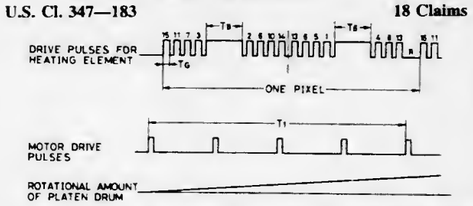
Hideyuki Kokubo, Saitama, Japan, assignor to Fuji Photo Film Col., Ltd., Kanagawa, Japan

Filed Nov. 3, 1993, Ser. No. 145,107

Claims priority, application Japan, Nov. 4, 1992, 4-295444

Int. Cl.[6] B41J *2/355*

U.S. Cl. 347—183 **18 Claims**



1. A color thermal recording method for recording full-color images on thermosensitive color recording material by use of a thermal head, said recording material comprising a support and at least first to third thermosensitive color layers formed thereon in order, said first coloring layer having lower heat sensitivity than said second coloring layer, said second coloring layer having lower heat sensitivity than said third coloring layer, said thermal head having a plurality of heating elements, each of which is driven by a pulse train in combination of a bias pulse for raising temperature substantially up to coloring temperature in order to record one pixel in a selected one of said color layers, and gradation pulses, a number of which represents density of recording on said pixel, said recording method comprising steps of:

dividing said pulse train into N pulse sub-trains, each of which comprises one of N subsidiary bias pulses into which said bias pulse is divided at an equal width, and one of N gradation pulse groups into which said gradation pulses are divided substantially equally, each of said pulse sub-trains resulting in a recording density lower than a desired final density of said pixel;

supplying said thermal head with said N pulse sub-trains said recording material is moved relative to said thermal head by an amount of said one pixel, in order to record said one pixel in said selected one of said coloring layers; and

wherein, in a beginning of each of said pulse sub-trains, a first half of said gradation pulse group, then generating said subsidiary bias pulse, and, finally, generating a second half of said gradation pulse group is generated.

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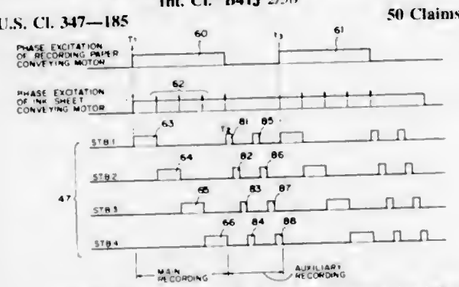
5,587,733
RECORDING APPARATUS WHICH AVOIDS INK SHEET STICKING AND IMAGE STREAKING

Takeshi Ono, Yokohama; Takehiro Yoshida, Tokyo; Makoto Kobayashi, Tama; Satoshi Wada, Kawasaki; Hisao Terajima, Yokohama; Minoru Yokoyama, Yokohama; Takashi Awai, Yokohama; Akihiro Tomoda, Yokohama, and Yasushi Ishida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 89,639, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 431,840, Nov. 6, 1989, abandoned. This application Oct. 26, 1994, Ser. No. 329,621
Claims priority, application Japan, Nov. 9, 1988, 63-281372
Int. Cl.[6] B41J *2/38*
U.S. Cl. 347—185 **50 Claims**



1. A thermal transfer recording apparatus for transferring ink of an ink sheet onto a recording medium by utilizing thermal energy generated by a thermal head to record an image on the recording medium based on image data, said apparatus comprising:

a recording medium conveying mechanism for conveying the recording medium, said recording medium conveying mechanism having a driving section for generating a driving force for conveying the recording medium;

an ink sheet conveying mechanism for conveying the ink sheet; and

a control section for controlling image recording by the thermal head, conveyance of the recording medium by said recording medium conveying mechanism and conveyance of the ink sheet by said ink sheet conveying mechanism,

wherein after the image recording by the thermal head and between generation of the driving force by said driving section and next generation of the driving force, said control section controls said ink sheet conveying mechanism to convey the ink sheet to record an image of image data identical to that used in the image recording.

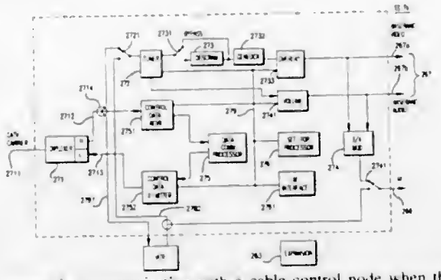
5,587,734
USER INTERFACE FOR SELECTING TELEVISION INFORMATION SERVICES THROUGH PSEUDO-CHANNEL ACCESS

Gary M. Lauder, Atherton; W. Leo Hoarty, Santa Clara, and Joshua W. Soske, Sunnyvale, all of Calif., assignors to ICTV, Inc., Los Gatos, Calif.

Continuation-in-part of Ser. No. 56,958, May 3, 1993, Pat. No. 5,526,034, which is a continuation-in-part of Ser. No. 877,325, May 1, 1992, Pat. No. 5,412,720, which is a continuation-in-part of Ser. No. 754,932, Sep. 10, 1991, Pat. No. 5,220,420, which is a continuation of Ser. No. 589,205, Sep. 27, 1990, Pat. No. 5,093,718. This application Nov. 3, 1994, Ser. No. 333,957
Int. Cl.[6] H04N *7/173*
U.S. Cl. 348—10 **6 Claims**

1. A television interface controller connected to a cable carrying a plurality of non-interactive channels on a first group of carrier frequencies and a plurality of pseudo-channels, each assigned to an information service from a plurality of information services, on a second group of carrier frequencies, said interface controller comprising:

means for receiving a channel selection;



means for communicating with a cable control node when the channel selection is one of said pseudo-channels;

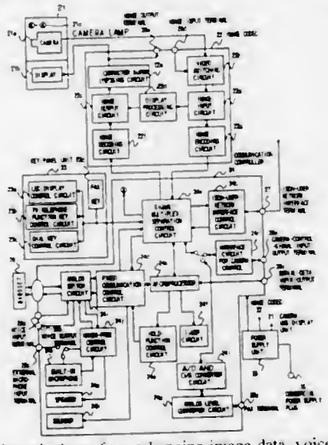
a tuner having an input connected to said cable and an output; and

processor means, in communication with said channel selection receiving means and said communicating means, for controlling said tuner to tune to the carrier frequency of the channel selection if the channel selection is a non-interactive channel and to tune to one of said second group of carrier frequencies in accordance with said communicating means if the channel selection is one of said pseudo-channels.

5,587,735
VIDEO TELEPHONE

Kiyoshi Ishida, and Hiroshi Goto, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 918,054, Jul. 21, 1992, Pat. No. 5,400,068, and a continuation-in-part of Ser. No. 838,348, Feb. 20, 1992, Pat. No. 5,396,269. This application Dec. 22, 1994, Ser. No. 361,957
Claims priority, application Japan, Jul. 24, 1991, 3-184669
The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.
Int. Cl.[6] H04N *7/14;* **H04M** *11/00*
U.S. Cl. 348—14 **13 Claims**



1. A video telephone for exchanging image data, voice data and user data through a digital communication channel in real time, comprising:

(a) a communication controller for controlling communication of image data, voice data and user data, which are multiplexed, through the digital communication channel;

(b) a multiplexor-separator for separating multiplexed image data and voice data received by said communication controller, and for multiplexing image data and voice data into multiplexed data which are to be transmitted,

(c) an image CODEC for decoding image data, which are separated by said multiplexor-separator, into an image signal and for coding an input image signal into image data and transmitting image data to said multiplexor-separator;

(d) a camera for outputting an image signal, which is taken by said camera, to said image CODEC as an image signal to be coded;

(e) a display for displaying an image represented by an image signal which is decoded by said image CODEC;

(f) a voice communication controller for decoding voice data, which are separated by said multiplexor-separator into voice signal and for coding an input voice signal into voice data and transmitting voice data to said multiplexor-separator;

(g) a speaker for outputting a voice represented by a voice signal which is decoded by said voice communication controller;

(h) a microphone for transmitting the voice signal, which is produced by said microphone, to said voice communication controller as the voice signal to be coded;

(i) a power supply unit for receiving a supply of power from an external source and distributing the power to each electrical part of the video telephone;

(j) a key input unit having a plurality of keys;

(k) an image input terminal;

(l) an image output terminal for outputting the image signal decoded by said image CODEC;

(m) a video switch for outputting the image signal from said camera or the input image signal from said image input terminal to said image CODEC as the image signal to be coded;

(n) a voice input terminal;

(o) a voice output terminal;

(p) an audio switch for outputting an input signal from said voice input terminal or the voice signal taken by the microphone to said voice communication controller as the voice signal to be coded, and for outputting the voice signal, which is decoded by said voice communication controller, to said speaker or said voice output terminal;

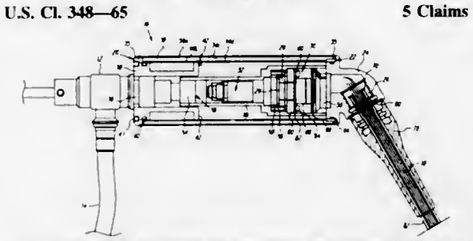
(q) a data terminal; and

(r) a control unit, responsive to the key input from said key input unit, for controlling said video switch and said audio switch and controlling inputting and outputting of user data between said multiplexor-separator and said data terminal.

5,587,736
STERILIZABLE CCD VIDEO CAMERA

Robert R. Walls, Santa Barbara, Calif., assignor to Envision Medical Corporation, Goleta, Calif.

Filed Feb. 16, 1993, Ser. No. 18,053
Int. Cl.[6] A61B *1/04*
U.S. Cl. 348—65 **5 Claims**



1. A sterilizable apparatus for protecting at least one CCD and a portion of an endoscope, comprising:

a housing having a forward end and rear end, the housing including inner and outer walls separated by a vacuum, an exterior of the housing capable of withstanding temperatures of about 130 degrees Centigrade, the housing capable of preventing electromagnetic interference and gaseous and liquid contaminants from reaching an interior of the housing;

an end bushing mounted in the interior of the housing in proximity to the forward end and coupled to the endoscope, the end bushing providing rotation of the endoscope relative to the housing, and comprising a material capable of withstanding temperatures of about 130 degrees Centigrade;

a backing for receiving a cable, the backing comprising a low heat-conducting material and mounted to the housing in proximity to the rear end;

a support member for positioning the at least one CCD within the inner walls so that the at least one CCD is not heated above approximately 80 degrees Centigrade, the support member being made of a low heat-conducting material and having a long, thin configuration for reducing thermal conduction to the at least one CCD, the support member being attached to the backing and extending toward the forward end for engagement with the endoscope;

coupling optics mounted on the support member and coupled to the endoscope and the at least one CCD;

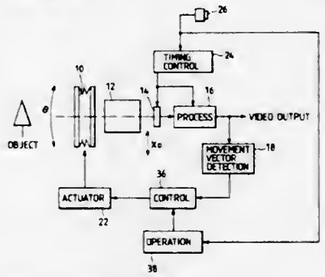
a heatsink coupled to the at least one CCD and mounted to the support member; and

electronics mounted on the support member and coupled to the at least one CCD and the cable.

5,587,737
SHAKEPROOF CAMERA WHEREIN SHAKE CORRECTION PARAMETERS MAY BE CHANGED

Masayoshi Sekine, Tokyo; Toshiaki Kondo, Fujisawa, and Yoshiki Kino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 6,974, Jan. 21, 1993, abandoned. This application May 25, 1995, Ser. No. 449,917
Claims priority, application Japan, Jan. 23, 1992, 4-010184
Int. Cl.[6] H04N *5/228*
U.S. Cl. 348—208 **22 Claims**



1. A shakeproof camera comprising:

(A) image pickup means;

(B) shake detecting means for detecting an image shake from an image pickup signal output from said image pickup means;

(C) shake correcting means for correcting the image shake in accordance with an output from said shake detecting means;

(D) control structure for changing an accumulation time of said image pickup means; and

(E) control means for changing correction parameters of said shake correcting means in accordance with a variation of the accumulation time of said image pickup means controlled by said control structure.

5,587,738
SOLID-STATE IMAGE PICKUP DEVICE HAVING PLURAL SWITCHES FOR SUBTRACTING A STORED SIGNAL FROM A PIXEL OUTPUT

Mahito Shinohara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1994, Ser. No. 342,042
Claims priority, application Japan, Nov. 17, 1993, 5-287854; Nov. 17, 1993, 5-287855
Int. Cl.[6] H04N *5/335*
U.S. Cl. 348—302 **3 Claims**

1. A solid-state image pickup device, wherein plural photoelectric conversion pixels, each of which accumulates electric charges

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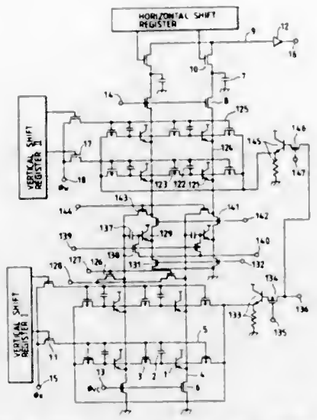


created due to energy of received light and produces amplified electric charges, are arranged in a matrix form, comprising:

a respective capacitor having an input terminal connected to each of said plural photoelectric conversion pixels, each capacitor further having an output terminal;

a respective transistor having a control electrode connected to said output terminal of each said capacitor;

a respective first switch for switching each said control electrode to a first predetermined potential or an electrically-floated state;

a respective second switch for selectively switching said input terminal of each said capacitor to a second predetermined potential or an electrically-floated state;

a respective third switch for selectively inputting a predetermined stored signal to said input terminal of each said capacitor;

a respective signal accumulating pixel which accumulates an output signal from each said transistor; and

a respective fourth switch for connecting an output line for each said photoeletric conversion pixel to an output line for said respective signal accumulation pixel.

5,587,739

VARIABLE MAGNIFICATION IMAGE TAKING DEVICE

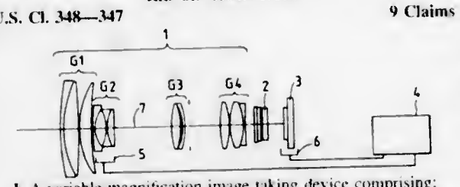
Takeshi Suzuki, Ebina, and Atushi Sekine, Kasukabe, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 217,842, Mar. 25, 1994, abandoned. This application May 17, 1995, Ser. No. 443,897

Claims priority, application Japan, Mar. 26, 1993, 5-090533; May 31, 1993, 5-149728; Dec. 22, 1993, 5-345620

Int. Cl.[6] H04N *5/232*

U.S. Cl. 348—347 **9 Claims**



1. A variable-magnification image taking device comprising:

a phototaking lens in which magnification is varied by zooming;

a solid-state image taking device which receives an object image formed by said phototaking lens and stores image information thereof;

a moving device which moves said solid-state image taking device along an optical axis; and

a control unit which receives information as to magnification variation of said phototaking lens and which controls said moving device according to the magnification variation of said phototaking lens, so as to compensate displacement of an image point of the object image which moves with zooming of said phototaking lens.

5,587,740

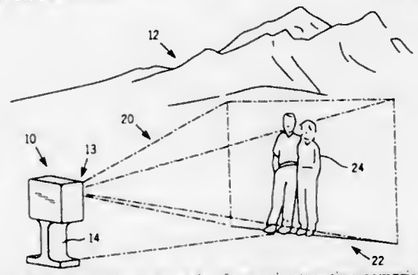
DIGITAL PHOTO KIOSK

James M. Brennan, 3054 N. Downer Ave., Milwaukee, Wis. 53211

Filed Aug. 17, 1995, Ser. No. 516,273

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—373 **4 Claims**



1. A kiosk providing postcards of a scenic attraction comprising:

an enclosed housing having a front panel with an aperture;

an anchor affixing the housing to the ground with the front panel facing the scenic attraction;

a payment receiver affixed to the housing to provide a payment signal indicating a payment by a user;

an electronic camera affixed within the housing to receive an image of the scenic attraction through the aperture to produce electronic image signals;

an electronic printer receiving electronic image signals and producing a printed postcard depicting the image;

an electronic computer including computer memory receiving the electronic image signals from the electronic camera and storing them in computer memory and after receiving the payment signal, operating according to a stored program to control the electronic printer to print the postcard depicting the scenic attraction;

a clear motorized cover positioned over the aperture and connected to the electronic computer wherein the electronic computer operates to open the motorized cover only after the payment signal has been received;

and

an acceleration sensitive switch producing a tamper signal and wherein the electronic computer operates according to the stored program to store images taken through the cover if the tamper signal is received.

5,587,741

APPARATUS AND METHOD FOR DETECTING MOTION VECTORS TO HALF-PIXEL ACCURACY

Sang-Ho Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

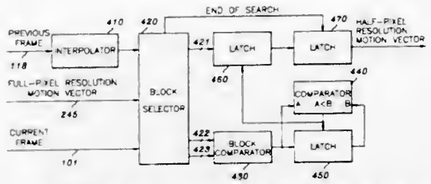
Filed Jul. 21, 1994, Ser. No. 278,663

Claims priority, application Rep. of Korea, Jul. 21, 1993, 3-13836

Int. Cl.[6] H04N *7/36*

U.S. Cl. 348—416 **2 Claims**

1. A method for determining motion vectors between a current frame and a preceding frame of video signals to a half-pixel accuracy, wherein the current frame is divided into a multiplicity of search blocks of an identical size and the preceding frame is made to include a corresponding number of search regions, each of the search regions having M candidate blocks of said identical size, M being an integer greater than 1, which comprises the steps of:



(a) calculating M first error functions, each of the M first error functions representing the difference between a search block in the current frame and each full-pixel resolution candidate block, included in the corresponding search region of the preceding frame;

(b) selecting K full-pixel resolution motion vectors for the search block which yield smallest first error functions among said M first error functions, K being an integer greater than 1 and smaller than M;

(c) obtaining M half-pixel resolution candidate blocks, in a half-pixel resolution search region corresponding to one of the K full-pixel resolution motion vectors;

(d) calculating M second error functions, each of the M second error functions representing the difference between the search block in the current frame and each of said M half-pixel resolution candidate blocks;

(e) repeating steps (c) to (d) for the remaining (K−1) full-pixel resolution motion vectors obtained in step (b), providing K×M second error functions;

(f) selecting a half-pixel resolution motion vector for the search block, said half-pixel resolution motion vector yielding a second error function which is smallest among the K×M second error functions; and

(g) repeating steps (a) to (f) until all the search blocks in the current frame are processed.

5,587,742

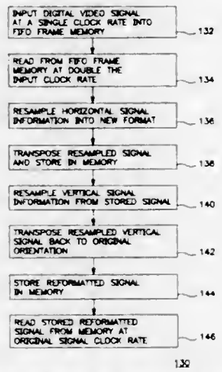
FLEXIBLE PARALLEL PROCESSING ARCHITECTURE FOR VIDEO RESIZING

Clarence J.-Y. Hau, Mt. Laurel; Kevin J. Stec, Medford, and Kenneth E. Vavreck, Maple Shade, all of N.J., assignors to Panasonic Technologies, Inc., Princeton, N.J.

Filed Aug. 25, 1995, Ser. No. 519,437

Int. Cl.[6] H04N *7/01*

U.S. Cl. 348—441 **14 Claims**



1. A video format converter for converting a digital input signal having a first vertical sample size per unit length and a first horizontal sample size per unit length to a digital output signal having a second vertical sample size per unit length and a second horizontal sample size per unit length comprising:

a) a first memory means for storing said digital input signal;

b) a plurality of processing cells, each having:

i) horizontal resampling means for converting said first horizontal sample size per unit length of said digital input signal into said second horizontal sample size per unit length during a first time period, the horizontal resampling means comprising a sampling filter,

ii) second memory means for storing said digital input signal having said second horizontal sample size following said conversion in said horizontal resampling means,

iii) vertical resampling means for converting said first vertical sample size per unit length of said digital input signal having said second horizontal sample size into said second vertical sample size per unit length during a second time period, and

iii) third memory means for storing said digital input signal having said second vertical sample size following conversion in said vertical resampling means; and

c) fourth memory means for storing said digital input signal having said second vertical sample size from each of said plurality of processing cells, said stored signal constituting said digital output signal.

5,587,743

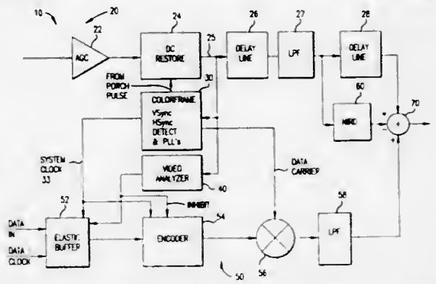
SIGNAL PROCESSORS FOR TRANSPARENT AND SIMULTANEOUS TRANSMISSION AND RECEPTION OF A DATA SIGNAL IN A VIDEO SIGNAL

Gerald D. Montgomery, and Jay B. Norrish, both of Mesa, Ariz., assignors to WavePhore, Inc., Tempe, Ariz.

Division of Ser. No. 947,134, Sep. 18, 1992, Pat. No. 5,387,941, which is a continuation-in-part of Ser. No. 715,920, Jun. 14, 1991, Pat. No. 5,327,237. This application Apr. 8, 1994, Ser. No. 224,734

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—473 **45 Claims**



1. A method of transmitting information, the method comprising:

receiving the information from a source;

generating a carrier at an odd quarter, non-integral multiple of the frequency of a raster rate of a rasterized video signal, the rasterized video signal having a bandwidth having spectral energy having chrominance and luminance components;

modulating the carrier based upon the received information so that the spectral energy of the modulated carrier is frequency interleaved with the chrominance and luminance components to provide a modulated signal;

injecting the modulated signal into the video signal bandwidth; and

transmitting the injected signal in a channel containing a signal format of said rasterized video signal.

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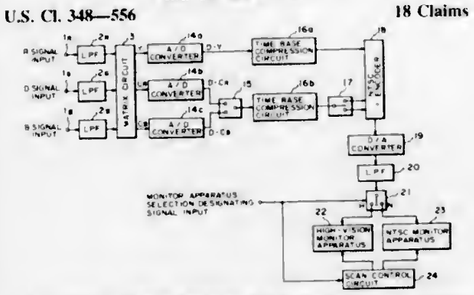
5,587,744

IMAGE DISPLAY APPARATUS

Yasuyuki Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 176,306, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 672,837, Mar. 21, 1991, abandoned. This application May 23, 1995, Ser. No. 447,838
Claims priority, application Japan, Mar. 26, 1990, 2-77493
Int. Cl.[6] H04N *5/46*

U.S. Cl. 348—556 **18 Claims**



1. An image display apparatus for displaying an image corresponding to an image signal, comprising:

(A) a first image display unit having a display screen of a first aspect ratio, for displaying the image corresponding to the image signal;

(B) a second image display unit having a display screen of a second aspect ratio different from said first aspect ratio, for displaying the image corresponding to the image signal;

(C) display selection designation means for selectively designating on which of said first image display unit and said second image display unit an image corresponding to a first image signal representative of an image having said first aspect ratio is to be displayed;

(D) image converting means for receiving the first image signal, converting said image having the first aspect ratio into an image having the second aspect ratio by changing a time base of the received first image signal so as to provide a horizontal scanning period of a second image signal corresponding to the image having said second aspect ratio, and outputting the image signal corresponding to the converted image having said second aspect ratio to the image display unit designated by said display selection designation means; and

(E) scanning control means for controlling a scanning range to the display screen of the image display unit designated by said display selection designation means, according to the aspect ratio of the display screen of the image display unit designated by said display selection designation means.

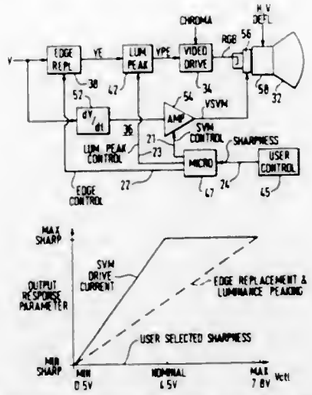
5,587,745

ADJUSTMENT OF SCAN VELOCITY MODULATION CONCURRENT WITH THE AMOUNT OF TRANSITION RISE TIME, PRE-SHOOT, AND OVERSHOOT OF A VIDEO SIGNAL

Dal F. Griepentrog, and Gene K. Sendelweck, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Jul. 5, 1994, Ser. No. 269,583
Int. Cl.[6] H04N *5/208*

U.S. Cl. 348—626 **13 Claims**



1. A scan velocity modulation circuit comprising:

a picture tube;

a source of a video signal;

a video processing stage coupled to said source for modulating an intensity of an electron beam in said picture tube responsive to said video signal;

edge replacement means for modulating the transition rise time of said video signal;

peaking means for modulating pre-shoots and overshoots of said video signal;

scan modulating means responsive to said video signal for modulating scanning of said electron beam in accordance with video content of said video signal;

a source of a control signal; and

control means having an input coupled to said control signal, an output coupled to said edge replacement means, to said peaking means and to said scan modulating means, for concurrently varying an amount of transition rise time of said video signal, an amount of pre-shoot and overshoot of said video signal, and an amount of electron beam scanning modulation produced by said scan modulating means, in accordance with said control signal.

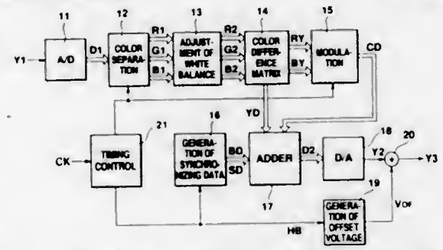
5,587,746

IMAGE SIGNAL PROCESSOR FOR OBTAINING DIGITAL IMAGE SIGNALS

Toshio Nakakuki, Gifu-ken, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 22, 1995, Ser. No. 493,448
Claims priority, application Japan, Jun. 24, 1994, 6-143342
Int. Cl.[6] H04N *5/04;5/14*

U.S. Cl. 348—708 **9 Claims**



1. An image signal processor for obtaining an image signal having a given format from digital image data which comprises a given number of horizontal scanning lines defining one scene, each of the horizontal scanning lines being formed by digital data for every pixel, said processor comprising an addition circuit actuated in synchronism with a horizontal scan cycle for adding synchronizing data taking the same range as can be taken by said digital image data to said digital image data; a D/A conversion circuit for converting said digital image data with the synchronizing data added thereto into an analog value to form an offset image signal having an offset value in a horizontal blanking term; and an offset circuit for changing the offset value of the horizontal blanking term of said offset image signal.

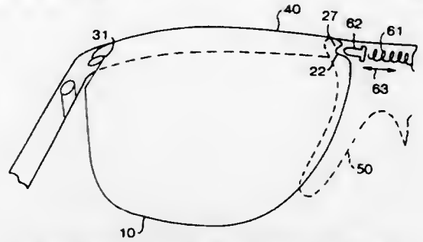
5,587,747

INTERCHANGEABLE EYEGLASS LENS SYSTEM

Charles A. Bernheiser, Kent, Wash., assignor to Gargoyles, Inc., Kent, Wash.

Continuation-in-part of Ser. No. 216,528, Mar. 22, 1994, Pat. No. 5,515,116. This application Jun. 7, 1995, Ser. No. 482,291
Int. Cl.[6] G02C *1/04;5/00*

U.S. Cl. 351—105 **2 Claims**



1. An interchangeable eyeglass lens system comprising:

a) at least one interchangeable lens;

b) a frame comprising a brow bar and a nosebridge, said brow bar having at least one stud disposed near a hinge end of said brow bar, said nosebridge having mounted therein a spring loaded detent mechanism for releasably interengaging a notch in an upper inner corner of one of said lenses;

c) said lens having at an upper outer corner a downwardly sloping nook for pivotally and releasably interengaging said stud.

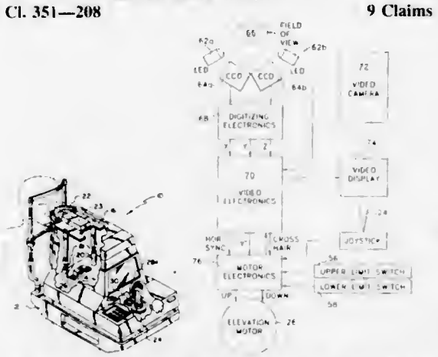
5,587,748

JOYSTICK OVERRIDE CONTROL FOR AN OPHTHALMIC INSTRUMENT

David A. Luce, Clarence Center, and Donald E. Miller, West Seneca, both of N.Y., assignors to Leica Inc., Depew, N.Y.

Filed Oct. 28, 1994, Ser. No. 331,137
Int. Cl.[6] A61B *3/14;3/10*

U.S. Cl. 351—208 **9 Claims**



1. An ophthalmic instrument alignment override comprising: a test axis passing through said instrument, motor drive means for moving said axis vertically, a first switch to activate said drive means in one direction, a second switch to activate said drive means in the other direction, manual means for selectively engaging said first or second switches to provide manual control of said drive means, optical means having a field of view and means for detecting the position of an eye, said optical means including signal means to generate a signal having a value representing a vertical location of the eye relative to said axis when the eye is within said field of view, and comparator means to determine when said signal means generates said signal and shift control of said drive means from said first and second switches to said signal, whereby said optical means is in exclusive control of said drive means if the eye is within said field of view.

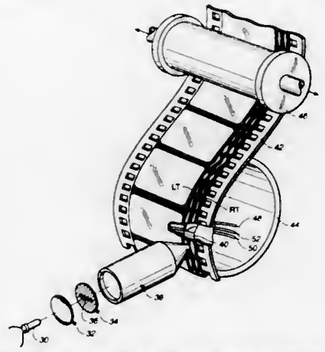
5,587,749

APPARATUS AND METHOD FOR READING MOTION PICTURE FILM PHOTOGRAPHIC DYE SOUNDTRACKS

Paul R. Goldberg, Palo Alto, and Martin J. Richards, Redwood City, both of Calif., assignors to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 322,830, Oct. 13, 1994. This application Nov. 9, 1994, Ser. No. 337,327
Int. Cl.[6] G03B *31/02*

U.S. Cl. 352—27 **2 Claims**



1. A combination reproducing audio signals, comprising

a three dye layer color motion picture film print, wherein the middle layer is a cyan layer, the print having a single-dye variable area analog soundtrack printed only in said cyan layer,

a light-emitting diode emitting substantially monochromatic narrow-bandwidth light in a range of wavelengths within the red portion of the spectrum, complementary to that of said cyan dye, said diode disposed to illuminate one side of the film, and

a signal-producing photocell or solar cell disposed on the other side of the film, opposite the diode, such that the cell senses light emitted from the diode and modulated by said single-dye soundtrack when the film is transported relative to the diode and the cell produces a signal representing the audio signals in said soundtrack.

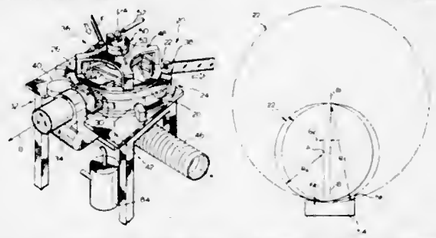
5,587,750

FILM TRANSPORT MECHANISM

Michael A. Gibbon; Ian Maxwell, both of Oakville, Canada, and Marian Toporkiewicz, Vorau, Austria, assignors to IMAX Corporation, Toronto, Canada

Filed May 8, 1996, Ser. No. 646,581
Int. Cl.[6] G03B *1/00*

U.S. Cl. 352—184 **11 Claims**



1. A mechanism for intermittently transporting film past a stationary film support element, the mechanism comprising:

a rotor rotatable about an axis and having a defined radius of curvature centered on said axis;

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stator means co-operating with the rotor to define a film passage and including said film support element, said element having a film support surface forming part of said film passage;

means upstream of said film support element for feeding film into said film passage at an input location; and,

means for receiving film from said film passage at an output location downstream of said film support element;

the rotor having gaps for receiving loops formed in film fed into said film passage and the rotor being rotatable about said axis to transport film through said film passage from said input location to said output location, so that successive portions of the film are laid onto and momentarily remain stationary on said film support surface of the film support element;

wherein the said film support surface has a radius of curvature centered on a defined axis, wherein said radius of curvature of the rotor is significantly smaller than the radius of curvature of the film support surface, and wherein the said rotational axis of the rotor is offset from said defined axis in a direction towards said film input location by an amount sufficient to provide a predetermined minimum gap between the rotor and the film support surface at a point upstream of said defined axis.

5,587,751

INFORMATION RECORDING DEVICE AND METHOD WITH FEEDING SPEED CONTROL

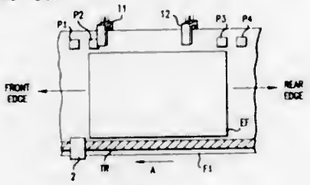
Hideo Hibino; Norikazu Yokonuma, both of Kanagawa-ken; Kazuyuki Kazami, Tokyo-to, and Youichi Yamazaki, Kanagawa-ken, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

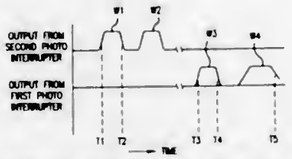
Filed Sep. 19, 1995, Ser. No. 529,993

Claims priority, application Japan, Dec. 5, 1994, 6-300970

Int. Cl.[6] G03B *17/24*

U.S. Cl. 396—319 **40 Claims**





1. An information recording device for use in a camera for recording photographic information on a film having an information recording area, the information recording device comprising:

a film feeding assembly that feeds the film within the camera at a film feeding speed during a film feeding operation;

an information recording assembly that records information on the information recording area during the film feeding operation;

a controller that determines whether information recording by said information recording assembly is complete before a first timing;

a film feeding speed controller connected to said film feeding assembly that controls said film feeding assembly to reduce the film feeding speed at the first timing when said controller determines that information recording is complete, said film feeding speed controller further controls said film feeding assembly to reduce the film feeding speed at a second timing after the first timing when said controller determines that information recording is not complete at the first timing, and wherein said film feeding speed controller further controls said film feeding assembly to stop film feeding at a third timing after the film feeding speed has been reduced; and

a recording controller connected to said information recording assembly that controls said information recording assembly.

5,587,752

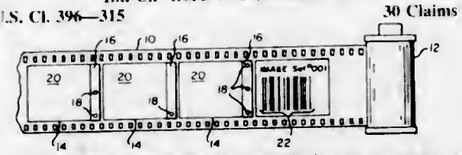
CAMERA, SYSTEM AND METHOD FOR PRODUCING COMPOSITE PHOTOGRAPHIC IMAGE

Dwight J. Petruchik, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1995, Ser. No. 462,330

Int. Cl.[6] G03B *17/24;29/00;27/52*

U.S. Cl. 396—315 **30 Claims**



1. A system for producing a composite image comprising a photographic image and a selected prerecorded image, said selected prerecorded image being from a set containing a plurality of prerecorded images, said system comprising:

a camera for capturing said photographic image on film, said camera including a select mechanism to select and record an identifier on said film in association with said photographic image, said identifier identifying the selected prerecorded image from the set containing the plurality of prerecorded images; and

an integrating system including

a scanner to scan said film with said photographic image and said identifier recorded thereon,

a retrieval mechanism responsive to said identifier scanned by said scanner to retrieve the selected prerecorded image from the set containing the plurality of prerecorded images, and

a computer for composing said composite image from said photographic image scanned by said scanner and the selected prerecorded image retrieved by said retrieval mechanism.

5,587,753

FILM FEEDING CONTROL DEVICE FOR ACCURATE ALIGNMENT OF FILM FRAMES AND CAMERA APERTURE

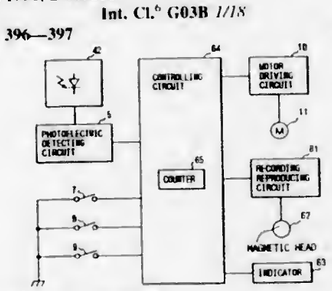
Kazuyuki Kazami, Tokyo, and Tsutomu Wakabayashi, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 222,360, Apr. 4, 1994, which is a continuation of Ser. No. 801,905, Dec. 3, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 472,730

Claims priority, application Japan, Dec. 6, 1990, 2-406296; Dec. 10, 1990, 2-409808

Int. Cl.[6] G03B *1/18*

U.S. Cl. 396—397 **4 Claims**



1. An apparatus, comprising:

a film feeding device which feeds a film in which each frame has only two perforations, said two perforations being spaced in a longitudinal direction of the frame and being positioned adjacent to respective ends of the frame;

a perforation detection device which detects a predetermined perforation of said film;

a reproduction device which reproduces clock data recorded on a magnetic recording medium coated on the film;

a counting device which is electrically connected to said reproduction device to count the clock data reproduced by said reproduction device;

a control circuit which is electrically connected to said perforation detection device to stop film feeding of said film feeding device and start counting the clock data by said counting device at substantially the same time when the film feeding is stopped when said perforation detection device detects said predetermined perforation; and

a conversion device which is electrically connected to said counting device to convert the counted clock data into a film feed overrun amount and output the film feed overrun amount.

5,587,754

CAMERA WITH GUIDING OF RECTILINEAR LENS MOVEMENT

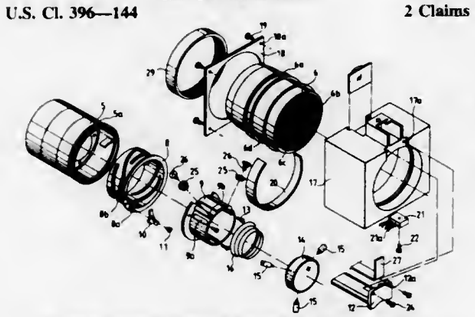
Akira Katayama, Koganei, and Hiroshi Terunuma, Ichikawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 418,899, Apr. 7, 1995, abandoned, which is a continuation of Ser. No. 270,319, Jul. 5, 1994, abandoned, which is a continuation of Ser. No. 138,385, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 717,346, Jun. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 607,710, Nov. 1, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 474,667

Claims priority, application Japan, Nov. 6, 1989, 1-287603; Nov. 14, 1989, 1-131661; Nov. 20, 1989, 1-133980; Nov. 20, 1989, 1-299568; Jun. 22, 1990, 2-065494

Int. Cl.[6] G02B *15/00*

U.S. Cl. 396—144 **2 Claims**



1. A camera having a camera housing and comprising:

a holding member that holds an imaging lens and that has a first helicoid formed around an optical axis of said lens;

a rotary member having a second helicoid which engages said first helicoid and which is rotatable about said optical axis relative to said camera housing;

a first guide member which has two guide surfaces extending parallel to said optical axis; and

a second guide member which has at least one pair of rotary elements disposed at positions spaced circumferentially with respect to said optical axis, said rotary elements of said one pair contacting said guide surfaces, respectively, of said first guide member;

one of said first and second guide members being fixed to said holding member and the other of said first and second guide members being fixed to said camera housing, so that contact of said guide surfaces and said rotary elements prevents rotation of said holding member about said optical axis and allows said holding member to move rectilinearly along said optical axis in accordance with rotation of said rotary member.

5,587,755

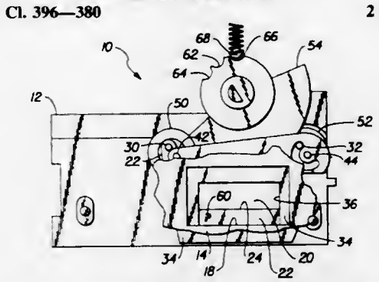
VARIABLE FORMAT VIEWFINDER FOR CAMERA

Matthew Wilson, Rochester, and Frank P. Lauricella, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1995, Ser. No. 371,340

Int. Cl.[6] G03B *13/10*

U.S. Cl. 396—380 **2 Claims**



1. A variable format viewfinder for a camera comprising masking blades movable to change the format of the view through said viewfinder to match the format of a picture to be taken, is characterized in that:

said masking blades have respective different aspect ratio indicators which are individually uncovered by one of the masking blades each time the one blade is moved to change the format of the view through said viewfinder, to permit an uncovered indicator to be seen to identify the particular aspect ratio of the picture to be taken.

5,587,756

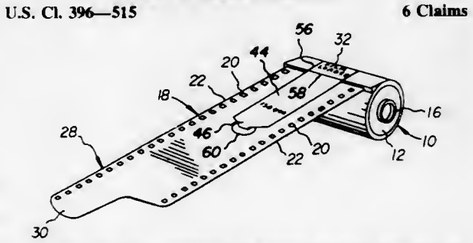
FILM CARTRIDGE WITH VISUAL INDICATOR FOR VERIFYING FILM LOADING IN CAMERA

Madhav Mehra, and Joseph A. Manico, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1996, Ser. No. 586,520

Int. Cl.[6] G03B *17/26;23/02*

U.S. Cl. 396—515 **6 Claims**



1. A film cartridge comprising a housing having a film exit slit, and a film roll support rotatable inside said housing to unwind a filmstrip from said film roll support to permit said filmstrip to be moved outwardly through said slit, is characterized by:

an indicator for providing a visible indication that said filmstrip has been moved outwardly through said slit;

a cover strip covering said indicator to prevent the indicator from being seen;

a tether having forward means located at said slit for releasably engaging said filmstrip and rearward means releaseably engaging said cover strip;

engageable means located on said filmstrip for engagement with said forward means as the filmstrip is moved outwardly

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through said slit, to make said tether move with the filmstrip to draw said cover strip off said indicator; and

return spring means for urging said tether to disengage said forward means from said engageable means and said rearward means from said cover strip after the cover strip is drawn off said indicator.

5,587,757

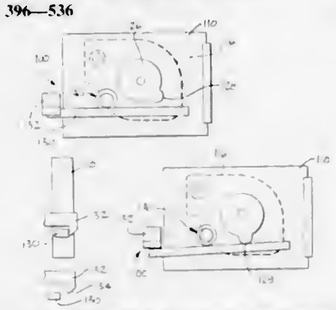
CAMERA ACCESS DOOR INTERLOCK MECHANISM

Tom Seamans, Corfu, and Stanley W. Stephenson, III, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 15, 1995, Ser. No. 388,785

Int. Cl.[6] G03B *17/02*

U.S. Cl. 396—536 **7 Claims**



1. A camera comprising a body having a chamber sized for containing a film cartridge, said film cartridge having a rotatable film spool for retaining a filmstrip and indicator means for indicating the exposure status of the retained filmstrip based on the rotational position of said film spool, and an access door for opening and closing said chamber, is characterized by:

an interlock mechanism connected to said access door and engageable with said spool of a loaded film cartridge for preventing said access door from opening until said spool is in a fixed rotational position to indicate the filmstrip is exposed wherein said interlock mechanism includes:

a spool engagement element engageable with the drive socket of said spool for sensing spool rotation;

a cam element cooperable with said spool engagement element, said cam element having a cam with a riser corresponding to the exposed position of said spool in said cartridge;

a lever engageable by said cam riser; said lever being selectively movable between a plurality of positions dependent on the rotational position of said cam element; and

a latching assembly defined in part by said lever for selectively securing said access door and releasing said access door in response to the rotational position of said cam element.

5,587,758

PHOTO-DEVELOPING APPARATUS

Kazunobu Shima, and Yuji Yamamoto, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama-ken, Japan

Filed Oct. 18, 1995, Ser. No. 544,533

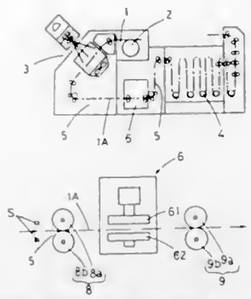
Claims priority, application Japan, Oct. 19, 1994, 6-253659; Jan. 10, 1995, 7-002175; Sep. 6, 1995, 7-229244

Int. Cl.[6] G03D *3/08;13/00*

U.S. Cl. 396—613 **28 Claims**

1. A photo-developing apparatus cutting a rolled-paper pulled out from a magazine into a desired length of sheet paper, printing the sheet paper in a printing unit and developing the sheet paper in a developing unit, comprising:

direction switching means in a transfer passage shifting the sheet paper to the developing unit from the printing unit, the direction switching means being disposed for rotating the sheet paper sent from the printing unit to change its direction within the range from 70 degree to 110 degree or from 250 degree to 290 degree.



5,587,759

AUTOMATIC DEVELOPING APPARATUS FOR SILVER HALIDE PHOTOSENSITIVE MATERIALS

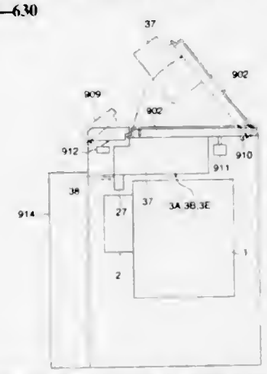
Noriaki Kurata, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Apr. 17, 1995, Ser. No. 423,297

Claims priority, application Japan, Apr. 30, 1994, 6-114285

Int. Cl.[6] G03D *3/02*

U.S. Cl. 396—630 **16 Claims**



1. An apparatus for processing a silver halide photographic material with a processing solution, comprising:

a processing tank in which the processing solution is stored;

a dissolving section for dissolving a solid processing agent, the dissolving section communicated with the processing tank so that the processing solution is circulated between the processing tank and the dissolving section;

an accommodation member in which the solid processing agent is stored;

a supply member having an inlet opening with which the accommodation member is detachably connected and an outlet opening so that the supply member receives the solid processing agent through the inlet opening and discharges the solid processing agent through the outlet opening; and

a processing agent supply section in which the accommodation member and the supply member are constructed in a single body, the processing agent supply section movable together with the accommodation member and the supply member between a first position and a second position, wherein the supply member is connected with the dissolving section in the first position so that the solid processing agent is supplied from the outlet opening of the supply member into the dissolving section, and the supply member is disconnected from the dissolving section in the second position so that the outlet opening of the supply member is isolated from the dissolving section.

5,587,760

AUTOMATIC DEVELOPING APPARATUS USED FOR SILVER HALIDE PHOTOSENSITIVE MATERIAL

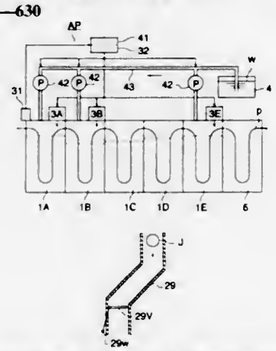
Noriaki Kurata, and Kenji Kuwae, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 1, 1995, Ser. No. 432,510

Claims priority, application Japan, May 12, 1994, 6-098848

Int. Cl.[6] G03D *3/02*

U.S. Cl. 396—630 **24 Claims**



1. An apparatus for processing a silver halide photographic material with a processing solution, comprising:

a tank in which the processing solution is stored;

replenishing means for replenishing a solid processing agent into the processing solution in the tank in which the solid processing agent is dissolved in the processing solution, the replenishing means positioned above the level of the processing solution so that the solid processing agent is dropped from the replenishing means to the processing solution; and

a guide passage constructing member comprising an inner wall surface forming and enclosing a guide passage, said guide passage constructing member being provided between the replenishing means and the processing solution and guiding the dropped solid processing agent along the enclosed guide passage and discharging the dropped solid processing agent through an exit opening of the enclosed guide passage into the processing solution, the guide passage constructing member so arranged that a part of the enclosed guide passage is inclined to a horizontal plane and having a ventilating opening to communicate between an enclosed space in the enclosed guide passage and an outer space of the enclosed guide passage separately from the exit opening.

5,587,761

AUTOMATIC FOCUSING APPARATUS

Yosuke Kusaka; Masaru Muramatsu; Ken Utagawa, all of Yokohama, and Shozo Yamano, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

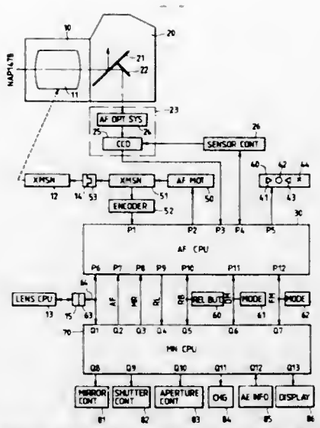
Continuation of Ser. No. 825,810, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 727,382, Jul. 5, 1991, abandoned, which is a continuation of Ser. No. 453,203, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 350,463, May 11, 1989, abandoned. This application May 17, 1995, Ser. No. 443,393

Claims priority, application Japan, May 13, 1988, 63-116171; Jul. 20, 1988, 63-179112; Oct. 3, 1988, 63-250600

Int. Cl.[6] G03B *13/00*

U.S. Cl. 396—95 **12 Claims**

1. A camera having an autofocusing mechanism, comprising:



focus detecting means for repeatedly detecting a focusing state of an objective lens with respect to a photographic object and outputting a focus adjustment signal;

object detecting means for detecting movement of the object to be photographed in accordance with a plurality of said focus adjustment signals and outputting a movement signal;

lens drive amount determining means for determining an amount of lens drive in accordance with said movement signal;

signal generating means for generating a signal indicative of a characteristic value of said objective lens;

compensating means for producing an amount of compensation in accordance with said characteristic value, and compensating the amount of lens drive based on said amount of compensation; and

lens drive means for driving said objective lens based on the amount of lens drive as compensated.

5,587,762

AUTOMATIC FOCUSING DEVICE

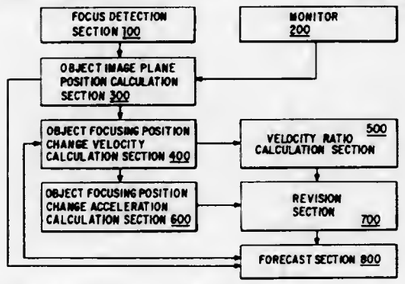
Toshimi Watanabe, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 9, 1995, Ser. No. 512,981

Claims priority, application Japan, Sep. 7, 1994, 6-213400

Int. Cl.[6] G03B *13/36*

U.S. Cl. 396—95 **23 Claims**



1. An auto-focus adjustment device comprising:

a focus detecting section that repeatedly detects a focus state of a photo lens;

a moving velocity determining section that determines at least a first velocity and a second velocity related to the movement of an object based on the focus states detected by said focus detecting section;

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an acceleration determining section that determines an acceleration of the object based on the first velocity and second velocity determined by said moving velocity determining section;

a velocity ratio determining device that determines a velocity ratio for the object based on the determined velocities from said moving velocity determining section; and

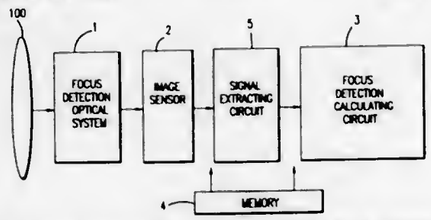
a forecast section that forecasts a position of the object based on the determined velocities, the velocity ratio, and the acceleration.

5,587,763

FOCUS DETECTION DEVICE AND METHOD

Shigeyuki Uchiyama, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,153
Claims priority, application Japan, Sep. 6, 1994, 6-212491
Int. Cl.[6] G03B *3/00*
U.S. Cl. 396—114 20 Claims



1. A focus detection device that determines a focus adjustment amount of a photo-optical system having at least an object lens, the focus detection device comprising:

a pair of photoelectric line image sensor arrays having a plurality of photoelectric conversion elements, the pair of photoelectric line image sensor arrays being capable of outputting a pair of signal strings corresponding to light intensity distributions from a pair of subject images;

a focus detection optical system that guides at least a pair of light rays from a subject through the object lens and to the pair of photoelectric line image sensor arrays to form the pair of subject images;

a controller having a focus detection algorithm section that determines focus adjustment condition of the object lens based on the pair of signal strings;

a memory that stores an error or offset amount between the pair of signal strings when the system is in a focused condition; and

a signal extractor that selects a pair of effective signal strings from the pair of signal strings based on a value relating to the error amount stored in the memory, wherein the controller computes a focus adjustment amount based on the pair of effective signal strings selected by the signal extractor.

5,587,764

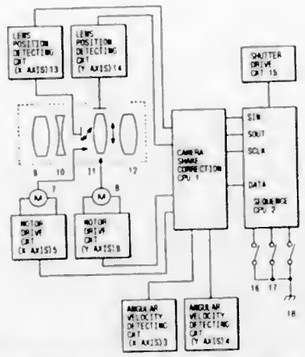
CAMERA-SHAKE CORRECTING CAMERA

Toshiyuki Nakamura, Tokyo, and Yoshikazu Iida, Chigasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 135,615, Oct. 14, 1993, abandoned.
This application Nov. 21, 1995, Ser. No. 561,157
Claims priority, application Japan, Oct. 30, 1992, 4-292335
Int. Cl.[6] G03B *3/00;17/00*
U.S. Cl. 396—55 3 Claims

1. A camera-shake correcting camera which corrects a camera shake by moving a camera-shake correcting system forming a part of a phototaking optical system, comprising:

a first controller to control movement of said camera-shake correcting system;



a second controller to execute a sequence control of said camera-shake correcting camera;

a first data transfer device to transfer data serially between said first controller and said second controller; and

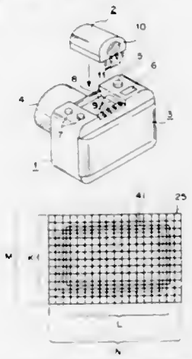
a second data transfer device, separate from said first data transfer device, to transfer a binary signal corresponding to a camera operation state between said first controller and said second controller, said second data transfer device performing the data transfer of the binary signal while said first controller is controlling said camera-shake correcting system.

5,587,765

CAMERA CAPABLE OF PERFORMING DIVISIONAL PHOTOMETRY

Tetsuro Goto, Funabashi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 145,503, Nov. 4, 1993, abandoned.
This application May 25, 1995, Ser. No. 450,223
Claims priority, application Japan, Nov. 5, 1992, 4-296028
Int. Cl.[6] G03B *7/08*
U.S. Cl. 396—234 19 Claims



1. A camera capable of performing divisional photometry, comprising:

a photometric sensor having a plurality of photoelectric conversion sub-elements arranged in close proximity to one another over a predetermined light receiving region in a two dimensional array, and which performs photometry on the photographic field divided into a plurality of regions;

an image projection optical system that projects an image of a photographic field upon light receiving surfaces of a proper subset of said plurality of photoelectric conversion sub-elements which occupies a region which is smaller than said light receiving region;

a mode setting device that sets either of a photographic mode and a field determination mode according to the actuation of an operating member;

a determination device that, when said field determination mode is set, based upon the photometric outputs from said plurality of photoelectric conversion sub-elements, determines for each of said plurality of photoelectric conversion sub-elements whether it is a valid sub-element which is included in said proper subset of said plurality of photoelectric conversion sub-elements upon which said image of said photographic field falls, or an invalid sub-element which is not included in said proper subset of said plurality of photoelectric conversion sub-elements upon which said image of said photographic field falls;

a storage device that stores the results of said determinations performed by said determination device;

a selection device that, based upon the information stored by said storage device, selects said valid sub-elements from said plurality of photoelectric conversion sub-elements; and

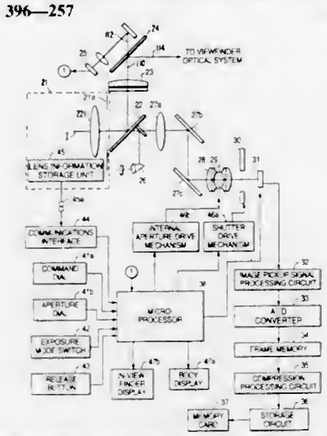
a calculation device that calculates an exposure value based upon the photometric outputs from said valid photoelectric conversion sub-elements selected by said selection device.

5,587,766

CAMERA WHICH SETS AN INTERNAL APERTURE VALUE IN ACCORDANCE WITH A CONVERTED PHOTOGRAPHIC LENS APERTURE VALUE

Koichiro Kawamura, Ichihara, and Ryo Uehara, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,140
Claims priority, application Japan, Feb. 13, 1995, 7-024254
Int. Cl.[6] G03B *7/095;7/097;7/20;17/18*
U.S. Cl. 396—257 10 Claims



1. A camera having a photographic lens installable thereon, the photographic lens including a photographic lens aperture having an open aperture value, the camera comprising:

a reduction optical system which reduces an optical image formed by the photographic lens when the photographic lens is installed on the camera, the optical image being reduced by a reduction ratio;

an internal aperture having a settable aperture value and which restricts light passing through the photographic lens and the reduction optical system when the photographic lens is installed on the camera; and

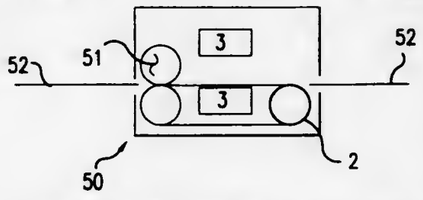
a control unit which receives the open aperture value of the photographic lens aperture when the photographic lens is installed on the camera, converts the open aperture value in accordance with the reduction ratio of the reduction optical system, and sets an aperture value of the internal aperture in a range having a lower limit of approximately the converted open aperture value.

5,587,767

DIGITAL FILM HEAT PROCESSOR AND METHOD OF DEVELOPING DIGITAL FILM

Abu S. Islam, Mt. Vernon; Robert J. Kleckner, Yorktown Hgts.; Leo Chin, Bronx, all of N.Y.; Hardy Sonnenberg, Puslinch, Canada, and Anthony A. Klein, Swampscott, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed May 4, 1995, Ser. No. 434,960
Int. Cl.[6] G03B *27/32;* G03D *13/00*
U.S. Cl. 355—27 21 Claims



1. A digital film processor, comprising:

a digital film support surface configured to support digital film thereon; and

heating means for developing the digital film supported on the digital film support surface by applying heat directly to the digital film without contacting the digital film;

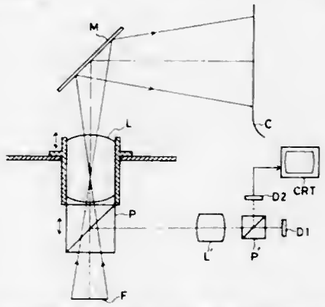
said digital film processor defining a heating region that is open to ambient atmosphere and being configured so that the digital film does not physically contact any member capable of distorting physical properties of the digital film.

5,587,768

PHOTOGRAPHIC PROJECTOR-PRINTER ASSEMBLY

Takashi Yamamoto; Yasunobu Sakaguchi, and Makoto Utsugi, all of Kaisei-machi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1992, Ser. No. 870,302
Claims priority, application Japan, Apr. 24, 1991, 3-094033
Int. Cl.[6] G03B *27/52*
U.S. Cl. 355—41 7 Claims



1. A photographic projector-printer assembly for projecting a negative film onto a photographic paper through a projecting lens for photographic printing, in which a part of the light from the negative film can be used for photometry and monitoring an image on the negative film, wherein said projecting lens is provided on its object side, as an integral piece, with an optical path-splitting prism for splitting the light for the photometric and monitoring purposes on the optical path, wherein said projecting lens is movably mounted on the assembly body so as to achieve focus

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regulation in the optical axis direction and said optical path-splitting prism is adjustable in the optical axis direction and around the optical axis in terms of its position with respect to said projecting lens.

5,587,769

IMAGE FORMING APPARATUS ALLOWING SIMPLE REPLACEMENT OF INTERMEDIATE TRANSFER MEMBER AND EASY MAINTENANCE AND HANDLING OF PAPER JAMS

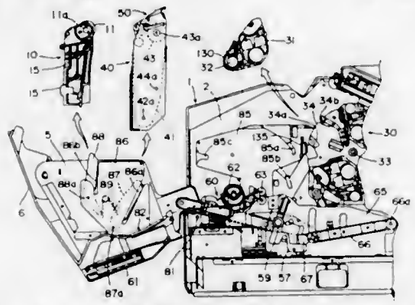
Kenji Sawada, Toyokawa; Masahiro Sato, Toyohashi; Hitoshi Sekino, and Masashi Sakamoto, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 7, 1995, Ser. No. 554,547

Claims priority, application Japan, Nov. 11, 1994, 6-277533

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—200 **8 Claims**



1. An image forming apparatus comprising:

an apparatus housing having a releasible and movable side frame, and stationary side frame,

a photosensitive unit having a photosensitive member and which is detachably mounted on said movable side frame, and

an intermediate transfer unit having an intermediate transfer member for temporarily receiving a transferred toner image formed on the surface of said photosensitive member in a primary transfer, and transferring said temporarily transfer toner image to a recording sheet in secondary transfer, said intermediate transfer unit being detachably mounted on said movable side frame.

5,587,770

DEVICE FOR DETECTING REMAINING LEVEL OF TONER

Hae-Seog Jo; Chang-Kyung Ko, and Dong-Ho Lee, all of Suwon, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 17, 1995, Ser. No. 389,942

Claims priority, application Rep. of Korea, Feb. 28, 1994, 3776/1994

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—208 **21 Claims**

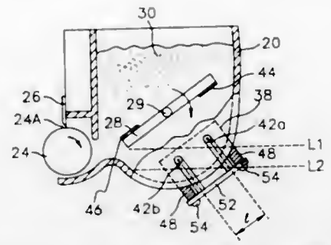
1. A developing device of an electrophotographic recording system developing an electrostatic latent image formed on a photosensitive drum into a visible image, said device comprising:

toner storing means for storing toner;

developing means for developing said electrostatic latent image formed on said photosensitive drum by said toner stored in said toner storing means;

a toner detecting device for detecting one of an existence and non-existence of said toner, said toner detecting device comprising:

first and second light-emitting means for emitting light from a first side of said toner storing means at first and second



predetermined heights from a bottom portion of said toner storing means, respectively; and

first and second light-receiving elements positioned on an interior of said toner storing means for respectively outputting first and second corresponding signals indicative of a remaining amount of said toner in response to an amount of light received from said first and second light-emitting means, respectively;

an agitator for conveying said toner stored in said toner storing means to said developing means while simultaneously cleaning a light-emitting side of said first and second light-emitting means and a light-receiving side of said first and second light-receiving elements in correspondence with a rotational period of said agitator; and

determining means for comparing a value obtained during a given time period by counting signals resulting from logically-adding said first and second corresponding signals with a predetermined value to determine a remaining level of said toner.

5,587,771

IMAGE SAMPLING AND COLOR SHIFT CORRECTION SYSTEM IN MULTIPLE IMAGE FORMING APPARATUS

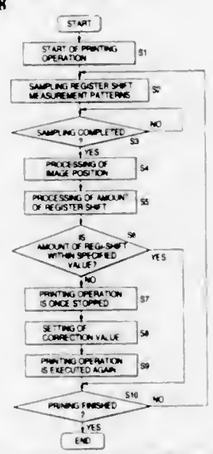
Hirotaka Mori, and Ryo Ando, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1995, Ser. No. 422,808

Claims prinrity, application Japan, Jun. 17, 1994, 6-135525

Int. Cl.[6] G03G *15/01*

U.S. Cl. 355—208 **20 Claims**



1. An image sampling and color shift correction system in a multiple image forming apparatus for forming a multiple image by providing a plurality of image output means along a transfer belt, said system comprising:

image control means which applies image data to respective said image output means for controlling image formation;

pattern generator means for repeatedly generating a register shift measurement pattern in a main scanning direction and a sub-scanning direction of said respective image output means, the register shift measurement pattern being formed outside the largest paper area;

sampling means for sampling an image formed by said respective image output means at both sides of a paper area on the transfer belt in the main scanning direction of the transfer belt;

processing means which takes data sampled by said sampling means for processing an amount of register shift; and

control means for controlling the image output means and the image sampling means to execute a correction operation in an area between a same one pair of the plurality of image output means.

5,587,772

IMAGE FORMING APPARATUS HAVING IMAGE SIGNAL DISCRIMINATION DEVICE

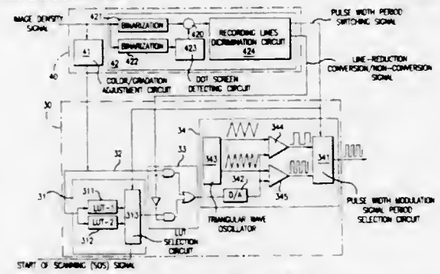
Kazuhiko Arai; Yasuhiro Oda; Masahiko Kubo; Masayo Higashimura; Kazuhiro Iwaoka, and Takayuki Yamashita, all of Nakai-machi, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1995, Ser. No. 543,911

Claims priority, application Japan, Dec. 12, 1994, 6-331437

Int. Cl.[6] G03G *15/04*

U.S. Cl. 355—208 **20 Claims**



1. An image forming apparatus comprising:

image signal discrimination means for discriminating whether an image density signal belongs to a line image portion or a natural image portion including a halftone image and outputting a discrimination signal;

first image density conversion means having a first conversion property for converting said image density signal to a conversion signal and outputting said conversion signal;

second image density conversion means having a second conversion property which is different from said first conversion property for converting a part of said image density signal corresponding to a low density portion to a conversion signal indicating a value within a range in which an image is not developed and outputting said conversion signal;

selection means for alternately selecting said first or second image density conversion means with a predetermined period;

pulse width modulation means for modulating pulse widths of said conversion signals output from said first and second image density signal conversion means and outputting a pulse width modulation signal;

pulse width modulation signal period changing means for changing a period of said pulse width modulation signal output from said pulse width modulation means and the period of selection by said selection means in accordance with said discrimination signal output from said image density signal discriminating means; and

image formation means for forming an image in accordance with said pulse width modulation signal output from said pulse width modulation means.

5,587,773

ELECTROPHOTOGRAPHIC APPARATUS FOR PERFORMING IMAGE EXPOSURE AND DEVELOPMENT SIMULTANEOUSLY

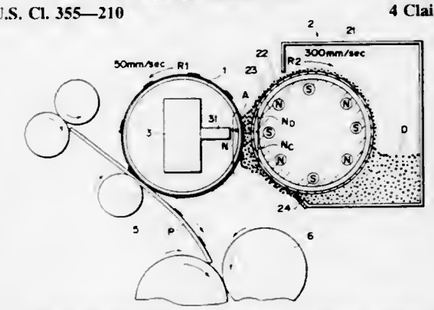
Hideyuki Yano; Junji Araya, both of Yokohama; Yukihiro Ozeki, Tokyo; Harumi Kugo, Kawasaki; Katsuhiro Sakaizawa, Tokyo; Tadashi Furuya, and Osamu Iwasaki, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 172,053, Dec. 23, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 366,431

Claims priority, application Japan, Dec. 26, 1992, 4-359310

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—210 **4 Claims**



1. An electrophotographic apparatus for forming an image on an endless electrophotographic photosensitive member by exposing one side of the electrophotographic photosensitive member to a light image and supplying a developer to the other side of the photosensitive member, said electrophotographic photosensitive member including a conductive layer disposed on a translucent substrate, a photosensitive layer made of an organic photoconductive material and disposed on the conductive layer, and an electric charge pour-in layer made of an insulative binder in which conductive powder is dispersed, said apparatus comprising:

optical means for exposing an interior side of the translucent substrate of said electrophotographic photosensitive member to a light image; and

developing means disposed at a position corresponding to an exposure position of said electrophotographic photosensitive member by said optical means, for forming a magnetic developer brush having a magnetic conductive carrier and an insulative toner to which a bias is applied, said brush being contactable with a surface of said electrophotographic photosensitive member, spanning an upstream side and a downstream side of the exposure position,

wherein said photosensitive member is charged by supplying electric charge into the electric charge pour-in layer upstream of the exposure position of said electrophotographic photosensitive member in a moving direction thereof by the magnetic brush, and wherein the insulative binder and the conductive powder are colored.

5,587,774

CLEANERLESS ELECTROGRAPHIC IMAGING DEVICE

Akira Nagahara; Sachio Sasaki; Mitsuhito Furukawa; Tsuneo Watanuki; Norio Sawatari, all of Kawasaki; Mikio Amaya, Atsugi, and Toshiaki Narusawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 4, 1995, Ser. No. 434,991

Claims priority, application Japan, Aug. 11, 1994, 6-189680

Int. Cl.[6] G03G *15/02;15/08*

U.S. Cl. 355—219 **64 Claims**

1. An imaging device, for use in an electrographic imaging process, which comprises:

an image-carrying element;

image exposure means for forming a charged latent image on a surface of the image-carrying element;

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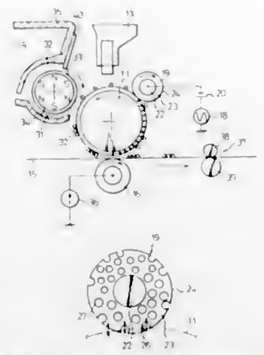


developing means for forming a visible image on the surface of the image-carrying element as a function of developing said latent image with a developer and, at substantially the same time, recovering residual developer, not transferred to an image-receiving element in the preceding image transfer process, from the image-carrying dement carrying said residual developer;

image transfer means for transferring the visible image from the image-carrying element to an image-receiving element; and

distribution roller means, made of an elastic and electrically conductive material, having depressions on its exterior surface for uniformly scattering and distributing the residual developer, which was not transferred to the image-receiving element in the above image transfer process, over the surface of the image-carrying element and, at substantially the same time, dedectrifying the charged surface of the image-carrying element with an AC electric field and, in combination therewith, freshly charging the deelectrified surface of the image-carrying element with a DC voltage.

5,587,775

IMAGE FORMING APPARATUS WITH ROTATING BRUSH FOR CHARGING

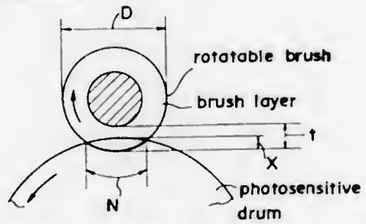
Kazuko Taniguchi, Takatsuki; Akihito Ikegawa, Sakai; Koji Uno, Toyokawa, and Hitoshi Saito, Mie-ken, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 9, 1995, Ser. No. 555,780

Claims priority, application Japan, Nov. 10, 1994, 6-276500

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 **4 Claims**



1. An image forming apparatus comprising:

an image bearing member;

a charging device including a rotatable brush for charging the image bearing member to form a latent image on the image bearing member by image exposure; and

developing device for developing the latent image, and collecting residual toner remaining on the image bearing member after transferring the developed image, wherein said rotatable brush rotates in such a direction that a contacting portion of the brush with the image bearing member moves in the same direction as a moving direction of a surface of the image bearing member, and is provided to satisfy the following condition:

$$20 \leq (N)^2/t \leq 35,$$

wherein N is a contact nip width between the charging brush and the image bearing member and t is a thickness of the charging brush.

5,587,776

MEMBER COMPRISING A POLYURETHANE RUBBER COMPOSITION CONTAINING AN AMINO CATALYST FOR REGULATING QUANTITY OF DEVELOPER AND DEVELOPING UNIT USING THE SAME

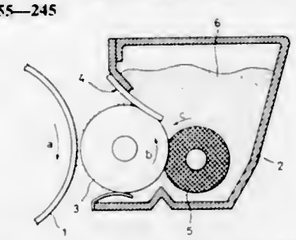
Masahiro Watabe; Noriyuki Yanai, both of Yokohama; Kentaro Niwano, and Arihiro Yamamoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 358,092

Claims priority, application Japan, Dec. 22, 1993, 5-324576

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—245 **10 Claims**



1. A member for regulating the quantity of a developer comprising a polyurethane rubber composition containing an amine catalyst.

5,587,777

DEVELOPING UNIT HAVING INTERLOCKING MECHANISM

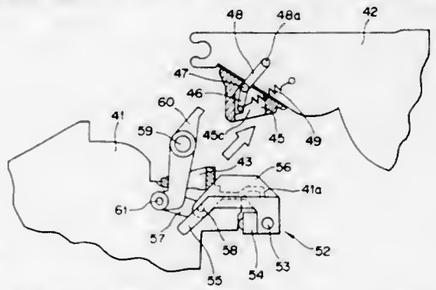
Takashi Miyaji; Yoshikazu Nishikawa; Yukinori Andou, all of Nara; Toshio Yamanaka, Yao, and Hideaki Kadowaki, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1995, Ser. No. 561,001

Claims priority, application Japan, Nov. 30, 1994, 6-297057

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—245 **7 Claims**



1. A developing unit, comprising:

a developing tank disposed to oppose a recording medium which is rotatably mounted on an image forming apparatus utilizing electrophotography and having a developing member which conveys a developer and attaches toner to an electrostatic latent image formed on said recording medium to develop the electrostatic latent image; and

a toner hopper having a toner supply port for supplying the toner to said developing tank through a toner replenishing port formed in said developing tank,

wherein said developing tank is detachable in a direction of a rotating shaft of said recording medium and is movable in a direction perpendicular to the direction of said rotating shaft of said recording medium so as to separate from or oppose said recording medium, said toner hopper having a shutter for opening/closing an opening of said toner supply port, and said image forming apparatus being provided with an interlocking mechanism which disconnects or connects said toner replenishing port and said toner supply port in an interlocking manner upon moving said developing tank to be separate from or to oppose said recording medium and which simultaneously operates said shutter to close or open the opening of said toner supply port.

5,587,778

OVERLAID IMAGE FORMING APPARATUS

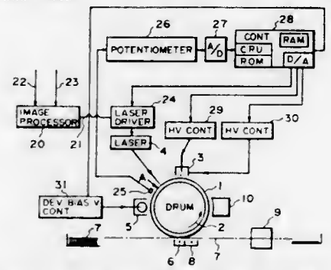
Hisashi Fukushima; Tatsuo Takeuchi; Harumi Sakoh, all of Kawasaki, and Nobuatsu Sasanuma, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 8,551, Jan. 22, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 353,343

Claims priority, application Japan, Jan. 23, 1992, 4-009821

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—246 **16 Claims**



1. An image forming method, comprising the steps of:

charging an image bearing member by a charger;

first detecting a surface potential of the charged image bearing member;

secondly detecting a surface potential of the image bearing member after the first detection; and

controlling an image forming condition on the basis of the difference between the potentials detected in the first and second detecting steps.

5,587,779

APPARATUS FOR TRANSFERRING TONER IMAGES

Theodorus A. G. Heeren, and Edwin J. Buis, both of Venlo, Netherlands, assignors to Oce-Nederland, B.V., MA Venlo, Netherlands

Filed Jul. 11, 1995, Ser. No. 501,183

Claims priority, application Netherlands, Aug. 22, 1994, 9401352

Int. Cl.[6] G03G *15/16*

U.S. Cl. 355—271 **14 Claims**

1. An imaging system comprising

at least one image forming medium for transferring toner images,

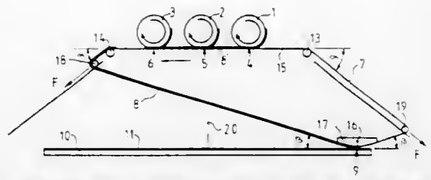
an endless intermediate medium adapted to be advanced in one direction, to which said toner images are to be transferred,

at least one image-forming station corresponding to each of said at least one image-forming medium provided where said at least one image-forming medium contacts said endless intermediate medium, said endless intermediate medium being continuously movable at said at least one image-forming station,

stationary image receiving material,

an image-transfer station at which said toner images on said endless intermediate medium are transferred to said stationary image receiving material, and

a first loop-forming means provided between said at least one image-forming station and said image-transfer station and a second loop forming means provided between said image-transfer station and said at least one image-forming station, as considered in the direction of advance of said endless intermediate medium, for periodically enabling stoppage of the advancement of said endless intermediate medium at said image-transfer station.



5,587,780

IMAGE FORMING APPARATUS WITH DIFFERENT POTENTIALS IN DIFFERENT DEVELOPING ZONES

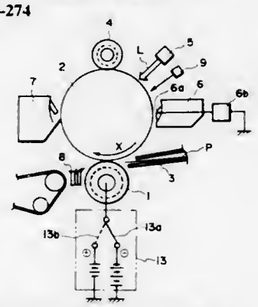
Osamu Sugino, and Takeo Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1995, Ser. No. 401,703

Claims priority, application Japan, Mar. 11, 1994, 6-041112; Mar. 1, 1995, 7-041814

Int. Cl.[6] G03G *15/16*

U.S. Cl. 355—274 **16 Claims**



1. An image forming apparatus comprising:

an image bearing member;

developing means for developing said image bearing member to form a Loner image on said image bearing member in a developing zone; and

a transfer member for transferring at a transfer position the toner image from said image bearing member to a transfer material, said transfer member being contactable to a side of the transfer material fed between said image bearing member and said transferring member that is opposite to a side facing said image bearing member, wherein during a portion of a period in which the transfer material is not at the transfer position, an electric field is generated for transferring toner having the same polarity as the toner image from said transferring member to a first region of said image bearing member; and

discharging means for discharging a second region of said image bearing member, said second region being in a non image-formation area of said image bearing member,

wherein a potential of the first region in the developing zone is different from a potential of the second region in the developing zone, and a bias voltage applied to said developing means

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when the first region is in the developing zone before the generation of the electric field is different from that applied when the second region having been discharged by said discharging means is in the developing zone.

5,587,781

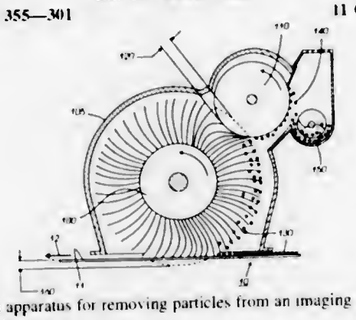
OPTIMIZING ELECTROSTATIC BRUSH INTERFERENCES FOR INCREASED DETONING EFFICIENCY

Ronald E. Auty, Rochester, and Dennis G. Gerhasi, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1995, Ser. No. 566,098

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—301 **11 Claims**



1. An apparatus for removing particles from an imaging surface, comprising:

means for cleaning particles from the imaging surface, said removing means and the surface having a first interference therebetween; and

means for removing particles from said cleaning means, said cleaning means and said removing means having a second interference therebetween, the second interference being greater than the first interference.

5,587,782

COPYING MACHINE FOR COPYING DOCUMENTS IN TWO-IN-ONE MODE

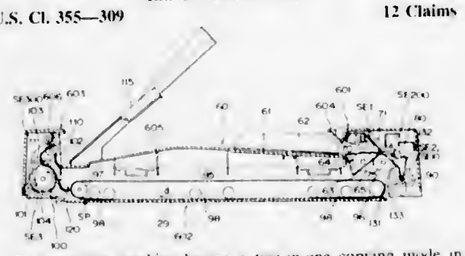
Akiyoshi Johdai, Toyokawa; Akira Ohhata, Toyohashi; Hiroki Yamashita, Okazaki; Hirokazu Matsuo, Toyohashi, and Yoshihito Hirano, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 27, 1995, Ser. No. 394,837

Claims priority, application Japan, Feb. 28, 1994, 6-055212

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—309 **12 Claims**



1. A copying machine having a two-in-one copying mode in which two document sheets are fed on a glass platen in series with respect to a document conveying direction and copied onto one copy sheet by one-time exposure scanning, the copying machine comprising:

a document feeder means for feeding document sheets toward the glass platen one by one to stop the document sheets at a first-out position which is situated on an upstream side of the document conveying direction;

a first conveying means for conveying the document sheets fed by the document feeder means onto the glass platen;

a second conveying means for conveying the document sheets conveyed by the first conveying means along the glass platen until the rear end of the document sheets reach a predetermined switch-back position, conveying the document sheets in the opposite direction to retreat a predetermined distance, conveying a first of the document sheets as well as a succeeding second document sheet stopped at the first-out position such that the front end of the first document sheet situated on a downstream side of the document conveying direction may be aligned with an exposure reference, and discharging the first and second document sheets to the downstream side of the document conveying direction after exposure; and

a third conveying means for conveying the document sheets discharged by the second conveying means from the glass platen to a discharge section;

whereby the document conveying length (d3) from the exposure reference to the third conveying means is longer than the sum (d4+Δdp) of the document conveying length (d4) from the first-out position to the switch-back position and the difference length (Δdp) of the document conveying direction between a document sheet having a longest length and a document sheet having a shortest length among document sheets to be handled in the two-in-one mode.

5,587,783

COLOR ELECTROPHOTOGRAPHIC APPARATUS HAVING AN INTERMEDIATE TRANSFER BELT VARIABLE IN SPEED

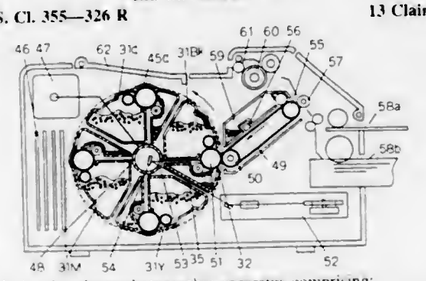
Masahiko Nakamura, Yao; Hajime Yamamoto, Ibaraki, and Hiroshi Terada, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 12, 1994, Ser. No. 304,767

Claims priority, application Japan, Sep. 16, 1993, 5-230070; Sep. 22, 1993, 5-236224; Nov. 1, 1993, 5-273434; Nov. 5, 1993, 5-276407; Jan. 28, 1994, 6-008257; Jan. 28, 1994, 6-008258

Int. Cl.[6] G03G *15/01*

U.S. Cl. 355—326 R **13 Claims**



1. A color electrophotographic apparatus comprising:

an image forming unit group containing a plurality of image forming units, each image forming unit comprising a photosensitive member, and developing means having a toner of different color than others and forming a toner image on the photosensitive member,

a movable transfer member on which the toner image on the photosensitive member is overlaid and transferred at a transfer position, and a color image is formed,

driving means for driving by selecting as a moving speed of the transfer member, a first running speed used when forming an image or a second running speed slower than the first running speed, said second running speed including a stopping state of the transfer member,

exposure means for exposing the image at an exposure position, said exposure position being a specific distance from the transfer position, and

moving means for moving the image forming unit group to sequentially position each image forming unit at an image forming position defining said exposure position and transfer position,

wherein the transfer member is driven at the second running speed while the image forming unit group is moving.

5,587,784

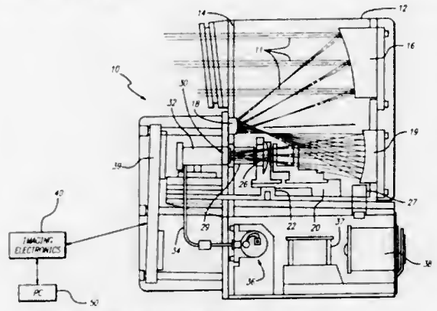
MULTISPECTRAL-STARING SENSOR

Michael Y. Pines, Los Angeles, and Donald F. King, Playa Del Rey, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Jun. 16, 1995, Ser. No. 491,133

Int. Cl.[6] G01C *3/08;* **G01J** *5/02*

U.S. Cl. 356—4.01 **19 Claims**



1. A multispectral imaging sensor comprising:

first means for sensing electromagnetic energy, the first means including a broadband detector capable of sensing energy in multiple bands of an electromagnetic spectrum;

second means in alignment with the first means for selectively filtering the electromagnetic energy for input to the first means, the second means including:

a first filter with a first passband,

a second filter with a second passband, and

means for selectively positioning either the first filter or the second filter in optical alignment with the first means; and

third means for directing electromagnetic energy from an input aperture to the second means.

5,587,785

LASER DOPPLER VELOCIMETER

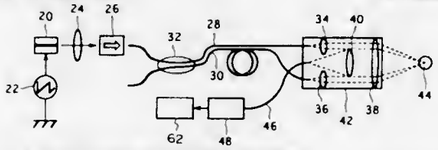
Satoru Kato; Hiroshi Ito; Tadashi Ichikawa, and Manabu Kagami, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Mar. 21, 1995, Ser. No. 407,671

Claims priority, application Japan, Mar. 22, 1994, 6-050690; Feb. 28, 1995, 7-040933

Int. Cl.[6] G01D *3/36*

U.S. Cl. 356—28.5 **10 Claims**



1. A laser Doppler velocimeter comprising:

a light source for emitting laser light whose frequency changes continuously for at least a fixed time duration;

a branching device for branching the laser light emitted from said light source into at least two beams;

at least one pair of optical fibers for transmitting each of the laser beams branched by said branching device, said optical fibers having an optical path difference therebetween;

at least one focusing device for focusing the laser beams transmitted by said optical fibers onto a region to be measured;

at least one incident device upon which is projected scattered light from the region to be measured where the laser beams are focused;

a light-receiving device for receiving the scattered light from said incident device; and

a calculating device for calculating at least one Doppler shift frequency in the region to be measured on the basis of a frequency of a signal of the scattered light received by said light-receiving device, said optical path difference, and a rate of change of the frequency of the laser light.

5,587,786

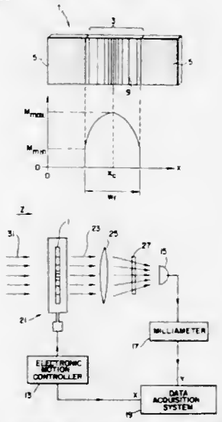
APPARATUS FOR MEASURING A BEAM WIDTH D_{OX} ALONG A TRANSVERSE DIRECTION OF A LASER BEAM AND METHOD THEREOF

Yves Champagne, Sainte-Foy; Claude Paré, Saint-Augustin-de-Desmaures, and Pierre-AndréBélanger, Sainte-Foy, all of Canada, assignors to Université Laval, Québec, Canada

Filed Feb. 23, 1995, Ser. No. 393,572

Int. Cl.[6] G01J *1/00*

U.S. Cl. 356—121 **19 Claims**



1. A method for measuring a beam width $D_{\sigma x}$ along a transverse direction of a laser beam having a full power P_0 and a given optical irradiance distribution, the method comprising the steps of:

(a) scanning a transverse direction X of a first optical filter with the laser beam to produce a first light signal modified by the filter during the scanning, the filter having a transmittance or reflectance profile M(x) varying along the transverse direction X and characterized by lines of constant transmittance or reflectance along a transverse direction Y which is perpendicular to the direction X, the profile M(x) varying along the direction X according to a one-dimensional inverted parabola with a central maximum M_{max} and two peripheral minima M_{min} separated by a distance W_F where a part of the laser beam falling outside the peripheral minima M_{min} of the inverted parabola is substantially blocked, the profile M(x) being defined by the following equation:

$$M(x) = M_{max} - \frac{4(M_{max} - M_{min})}{W_F^2}(x - x_c)^2$$

where M_{min}, M_{max} and W_F are predetermined constants and x_c is the value of x at a central position along the distance W_F,

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W_F being wide enough so that a part of the laser beam which spills past boundaries determined by minima M_{min} is negligible when the profile M(x) is centered on the optical irradiance distribution of the laser beam;

(b) detecting the light signal produced in step (a) to determine a maximum power value P_{max}; and

(c) calculating the beam width $D_{\sigma x}$ by means of the following equation:

$$D_{\sigma x} = \left\{ \frac{4W_F^2}{(M_{max} - M_{min})} \left(M_{max} - \frac{P_{max}}{P_0} \right) \right\}^{1/2}$$

5,587,787

PROCESS FOR MEASURING RELATIVE ANGLES

Heinz Jäger, Volketswil, Switzerland, assignor to J. Müller AG, Volketswil, Switzerland

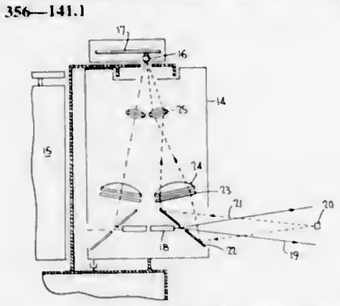
PCT No. PCT/CH93/00097, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO94/00778, PCT Pub. Date Jan. 6, 1994

PCT Filed Apr. 15, 1993, Ser. No. 199,167

Claims priority, application Switzerland, Jun. 22, 1992, 01965/92

Int. Cl.[6] G01B *11/26;* **G01C** *3/08;* **G02B** *26/08*

U.S. Cl. 356—141.1 **7 Claims**



1. A measuring apparatus for measuring relative angles between a reference direction of a measuring platform and remote points using light rays which emanate from the measuring platform, said measuring device including:

a housing which is mounted for rotation about a rotation axis, a first light transmitter mounted in said housing for emitting a first fan ray of light from said housing such that a light ray thereof which defines an axis of said first fan ray of light is perpendicular to said rotation axis, a first lens mounted on said housing to receive light reflected from said first fan ray of light by a remote point, a first fiber optic light guide located in said housing, said first fiber optic light guide extending along said housing axis and defining a first end for receiving light from said first lens and a second end for emitting light therefrom,

a light-sensitive sensor for receiving light passing out of said second end of said first fiber optic guide, and

evaluation means including a pulse counter connected to said light-sensitive sensor for counting time pulses from when said first fan ray of light passes through a reference direction at a start of an angular range of rotation to (a) when light reflected from said remote points is guided by said first optic light guide to said sensor and (b) when said first fan ray of light passes through an end of said angular range of rotation, and

a computer means for comparing said time pulse counts to determine relative angles between said reference direction and said remote points.

5,587,788

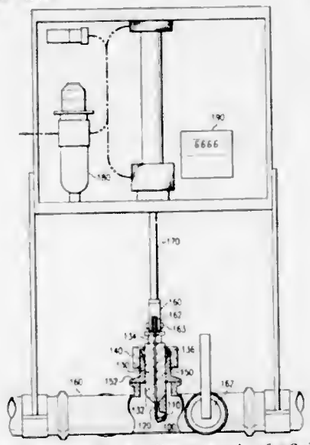
SAMPLING APPARATUS FOR INLINE SPECTROGRAPHIC ANALYSIS OF VISCOUS MATERIALS

John E. Slaughter, Richardson; George Olson, Plano, both of Tex., and William J. McShane, Arlington Heights, Ill., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 378,903, Jan. 26, 1995, abandoned, which is a continuation of Ser. No. 98,554, Jul. 28, 1993. This application Jan. 22, 1996, Ser. No. 589,812

Int. Cl.[6] G01N *21/01*

U.S. Cl. 356—246 **8 Claims**



1. A probe assembly for sampling a sample of a fluid, comprising:

and longitudinal member having a first aperture to receive and hold said sample of the fluid at a first position and a second aperture being a transparent window for normalization with a light transmission apparatus at a second position;

a sleeve having an aperture to slidably engage said longitudinal member, said sleeve having slots for positioning said light transmission apparatus and wherein said second aperture aligns with said slots for said normalization with said light transmission apparatus; and

means for sliding said longitudinal member between said first position where said first aperture receives said sample and said second position where said first aperture aligns with said slots.

5,587,789

APPARATUS AND METHOD FOR CONTROLLING RECORDING AND REPRODUCTION IN DIGITAL VIDEO CASSETTE TAPE RECORDER

Je H. Lee; Soo K. Kim; Sang J. Woo, and Tae S. Yang, all of Seoul, Rep. of Korea, assignors to Goldstar Co. Ltd., Seoul, Rep. of Korea

Filed Apr. 13, 1994, Ser. No. 227,281

Claims priority, application Rep. of Korea, Apr. 16, 1993, 6441/1993

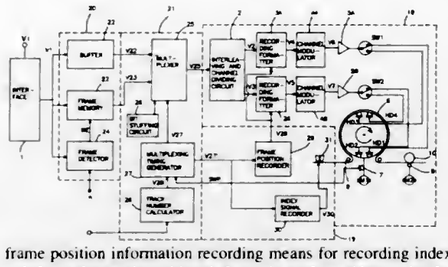
Int. Cl.[6] H04N *5/76;5/92*

U.S. Cl. 386—68 **22 Claims**

11. An apparatus for controlling recording in a video cassette tape recorder comprising:

frame extracting means for receiving compressed digital data input thereto and extracting specific data for a speed-varied reproduction from said compressed digital data;

frame recording position controlling means for generating a multiplexing timing signal and multiplexing said compressed digital data and said extracted specific data from said frame extracting means based on said multiplexing timing signal;



frame position information recording means for recording index information and position information of specific tracks for recording said specific data for the speed-varied reproduction on a magnetic tape based on said multiplexing timing signal; and

digital recording means for recording digital signals including said digital data and specific data from said frame recording position controlling means on the magnetic tape.

5,587,790

LIGHT SCATTERING TYPE SMOKE DETECTOR HAVING AN IMPROVED ZERO-POINT LEVEL

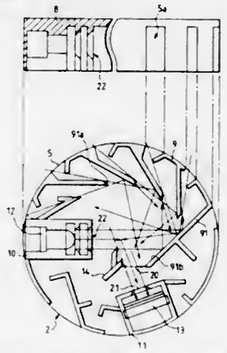
Tetsuya Nagashima, Tokyo, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 300,193

Claims priority, application Japan, Sep. 7, 1993, 5-221548; Sep. 7, 1993, 5-221549; Sep. 7, 1993, 5-221550; Sep. 7, 1993, 5-221551

Int. Cl.[6] G01N *21/00;21/49;* **G08B** *17/10*

U.S. Cl. 356—338 **28 Claims**



1. A light scattering type smoke sensor comprising:

a plurality of labyrinth members for facilitating an inflow of smoke entering from outside, and for cutting off light entering from the outside;

a smoke detecting chamber which is formed in a center portion by said labyrinth members;

light emitting means for radiating light toward said smoke detecting chamber; and

light receiving means for detecting light scattered by said smoke in said smoke detecting chamber, said light receiving means having an optical axis which intersects in said smoke detecting chamber an optical axis of said light emitting means at a scattering angle in a range of substantially 60° to 80°,

wherein one of said labyrinth members intersects said optical axis of said light emitting means, which has a reflecting face for reflecting light radiated from said light emitting means, said reflecting face reflecting said light in a direction opposite to said light receiving means,

wherein any points of an extension face of said labyrinth member which intersects said optical axis of said light emitting means are nearer to a center of said smoke detecting chamber than those of a light receiving window of said light receiving means, and

wherein said light receiving means includes said light receiving window, a light receiving device, and a holder which defines a position of said light receiving window and secures said light receiving device.

5,587,791

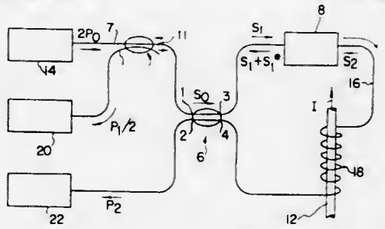
OPTICAL INTERFEROMETRIC CURRENT SENSOR AND METHOD USING A SINGLE MODE BIREFRINGENT WAVEGUIDE AND A PSEUDO-DEPOLARIZER FOR MEASURING ELECTRICAL CURRENT

Claude Belleville, Saint-Jean-Chrysostome; Richard Van Neste; Serge Caron, both of Québec; Alain C. Houle, Lachenaie, and Pierre Thibault, Boucherville, all of Canada, assignors to Citeq, Varennes, Canada

Filed Sep. 27, 1994, Ser. No. 313,690

Int. Cl.[6] G01B *9/02;* **G02B** *6/00*

U.S. Cl. 356—345 **19 Claims**



1. An interferometric current sensor for measuring a first electrical current, said sensor comprising:

a light source for generating a light beam;

a single mode birefringent waveguide having a linear birefringence and a circular birefringence, said circular and linear birefringences having respectively given orders of magnitude, the order of magnitude of said circular birefringence being equal or higher than the order of magnitude of said linear birefringence, said waveguide having a first loop portion for encircling said electrical current;

a beamsplitter having a first input port optically coupled to said light source, and second and third input/output ports optically coupled to ends of said waveguide for launching counter-propagating light beams into the respective ends of the waveguide and for receiving said counter-propagating light beams therefrom;

pseudo-depolarizer means for reducing sensitivity to at least one of mechanical vibrations and temperature variations, said pseudo-depolarizer means being optically coupled in series with said waveguide for converting each of said counter-propagating light beams into a predetermined ratio of useful counter-propagating light signals and useless counter-propagating light signals; and

an optical detector optically coupled to the ends of said waveguide via said beamsplitter for detecting a light intensity, said light intensity resulting from an interference of useful counter-propagating light signals and useless counter-propagating light signals, whereby said light intensity is representative of said current.

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5,587,792
APPARATUS AND METHOD FOR MEASURING THICKNESS OF THIN SEMICONDUCTOR MULTI-LAYER FILM

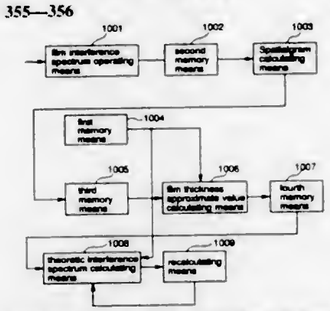
Seiji Nishizawa, 1919-8, Hane, Hamura-shi, Tokyo; Tokuji Takahashi, 1 Ban 5-1206, Toyosato 2-chome, Higashiyodogawa-ku Osaka-shi, Osaka, and Ryo Hattori, c/o Mitsubishi Denki Kabushiki Kaisha, Hikari Micro-ha Device Kenkyusho, 1 Mizuhara 4-chome, Itami-shi, Hyogo 664, all of Japan

Division of Ser. No. 262,840, Jun. 21, 1994. This application Oct. 11, 1995, Ser. No. 541,040

Claims priority, application Japan, Jun. 21, 1993, 5-148839

Int. Cl.[6] G01B *9/02*

U.S. Cl. 355—356 **6 Claims**



1. An apparatus for measuring thicknesses of layers in a thin semiconductor multi-layer film comprising:

a first memory for storing refractive index distribution and wavenumber dispersion data for respective layers of a multi-layer film;

a spectrometer for continuously measuring spectral distribution of light reflected from an underlying layer of the multi-layer film over a range from visible light to far infrared light;

film interference spectrum operating means for eliminating optical transmission characteristics of the spectrometer from the spectral distribution measured by the spectrometer and producing an interference spectrum including only multi-layer film interference components;

a second memory for storing the interference spectrum including only multi-layer film interference components produced by the film interference spectrum operating means;

Spatialgram calculating means for reverse Fourier transforming a wavenumber range of an interference spectrum excluding the optical transmission characteristics of the spectrometer and calculating a Spatialgram;

a third memory for storing the Spatialgram calculated by the Spatialgram calculating means;

layer thickness approximate value calculating means for reading out side burst peaks of the Spatialgram and the refractive index distribution of respective layers stored in the first memory and calculating approximate respective layer thicknesses;

a fourth memory for storing the approximate respective layer thicknesses calculated by the film thickness approximate value calculating means;

theoretical interference spectrum calculating means for obtaining a theoretical interference spectrum from a characteristic matrix calculation based on the approximate layer thicknesses, the refractive index distribution of respective films, and the wavenumber dispersion data stored in the first memory; and

recalculating means for comparing the measured interference spectrum with the theoretical interference spectrum, changing the layer thicknesses of the respective layers to lessen differences between the measured interference spectrum and the theoretical interference spectrum and recalculating the theoretical interference spectrum to obtain layer thicknesses of high precision.

5,587,793
BIREFRINGENCE DISTRIBUTION MEASURING METHOD

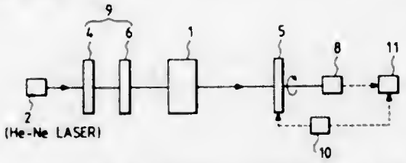
Sadao Nakai, 6-45, Kitakasugaoka 3-chome, Ibaragi-shi, Osaka; Yasukazu Izawa, Suita; Masanobu Yamanaka, Minoo; Masato Ohmi, Toyonaka; Masanori Akatsuka; Chiyoe Yamanaka, both of Osaka, and Yoshiyuki Yonezawa, Kawasaki, all of Japan, assignors to Sadao Nakai; Institute for Laser Technology, both of Osaka, and Fuji Electric Co., Ltd., Kanagawa, all of Japan

Continuation of Ser. No. 149,811, Nov. 10, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,157

Claims priority, application Japan, Nov. 12, 1992, 4-301443

Int. Cl.[6] G01N *21/23*

U.S. Cl. 356—367 **3 Claims**



1. A birefringence distribution measuring method of two-dimensionally measuring a birefringence distribution induced in a sample, comprising the steps of:

placing said sample between a circular polarizer and an analyzer in an optical path between a monochromatic light source and a two-dimensional optical receiver;

converting a plurality of parallel beams emitted from said monochromatic light source into circularly polarized light by said circular polarizer;

transmitting said circularly polarized light through said sample to said analyzer;

detecting image data by said two-dimensional optical receiver while rotating said analyzer about an axis of the plurality of beams, at a step of a fixed rotation angle;

sampling said detected image data and sending the sampled data to an image processing device; and

processing the sampled image data to obtain a relative phase difference due to birefringence of said sample, a two-dimensional birefringence distribution including the sign of said relative phase difference, and the direction of the principal axis.

5,587,794
SURFACE POSITION DETECTION APPARATUS

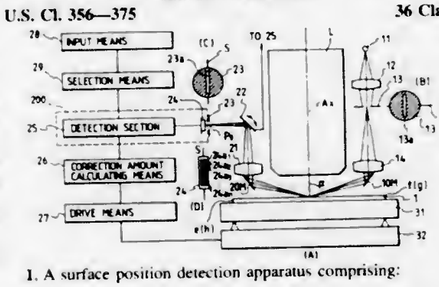
Hideo Mizutani; Naoyuki Kobayashi, both of Yokohama, and Nobutaka Magome, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 802,197, Dec. 4, 1991, abandoned. This application May 9, 1994, Ser. No. 239,847

Claims priority, application Japan, Dec. 13, 1990, 2-401880

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—375 **36 Claims**



1. A surface position detection apparatus comprising:

a projection optical system for projecting pattern light of a predetermined pattern onto a detection surface from an oblique direction relative to the detection surface;

an imaging optical system for forming an image of the pattern light reflected by the detection surface;

light-receiving-side light-shielding means arranged at a position substantially conjugate with the detection surface in said imaging optical system, and having an opening with a predetermined shape;

scanning means for scanning the image formed by said imaging optical system relative to said light-receiving-side light-shielding means;

means for designating a plurality of different parts of the pattern, in accordance with structure within an area on the detection surface that is disposed in a projection area of said projection optical system; and

means for dividing the pattern light into a plurality of portions corresponding to the different parts of the pattern, and for selectively detecting the portion or portions of the pattern light corresponding to the designated part or parts of the pattern and passing through said opening from said scanning means.

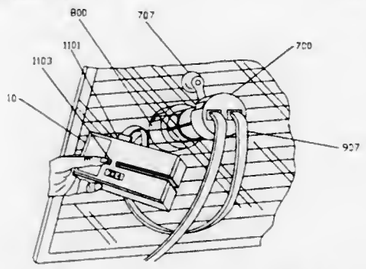
5,587,795
SELF ALIGNING SUBSTRATE TRANSMITTANCE METER

Robert D. Williams, 5374 S. Datura St., Littleton, Colo. 80120

Filed Jul. 13, 1995, Ser. No. 502,255

Int. Cl.[6] G01N *21/00*

U.S. Cl. 356—432 **19 Claims**



9. A self aligning window transmittance meter for measuring a light transmittance of a fixed window, comprising:

a remote transmitter having a first housing for holding a first magnet in a predetermined alignment with a light transmitter; and

a remote receiver having a second housing for holding a second magnet in a predetermined alignment with a light receiver, said remote receiver capable to output a transmittance signal, wherein said remote transmitter is placed against a surface of said fixed window such that said remote receiver is brought proximate to an opposing surface of said fixed window and within a magnetic flux of said first magnet such that said first and second magnets are releasably held against said surface and opposing surface, respectively, so as to cause said remote transmitter and remote receiver to self align for measuring a light transmitted through said fixed window by said light transmitter and received by said light receiver for providing a light transmittance measurement of said fixed window.

5,587,796
PHOTOELECTRIC MEASURING HEAD FOR THE CONTACTLESS SCANNING OF MEASURING FIELDS ON A PRINTING SHEET WITH AN AIR PERMEABLE ANNULAR DISK

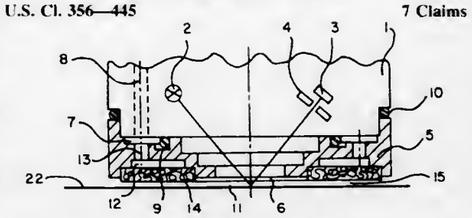
Peter Rakitsch, Moosburg, and Hans Zebentbauer, Germering, both of Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Dec. 22, 1994, Ser. No. 361,597

Claims priority, application Germany, Dec. 22, 1993, 43 43 810.5

Int. Cl.[6] G01N *21/55;* **G01J** *3/46*

U.S. Cl. 356—445 **7 Claims**



1. A photoelectric measuring head comprising:

an optical device for scanning measurement fields on a printing sheet, the optical device including a light generating means for directing light to the printing sheet and a photoelectric receiver for capturing light reflected from the printing sheet;

a cover including an orifice in which the optical device is disposed and a measuring diaphragm through which light from the light generating means and light reflected from the printing sheet travels;

at least one annular chamber extending in the cover concentrically relative to a central axis of the photoelectric measuring head such that the annular chamber does not block the measuring diaphragm, and wherein the at least one annular chamber holds and distributes compressed air; and

an air permeable annular disc mounted to the cover below the at least one annular chamber and wherein the at least one annular chamber provides the compressed air therein through the air permeabe annular disc providing an evenly distributed air flow at a predetermined flow rate that generates an air cushion between an underside of the cover and the printing sheet, the air permeable annular disc extends from the cover concentrically relative to a central axis of the photoelectric measuring head such that the air permeable annular disc does not block the measuring diaphragm.

5,587,797
PROCESS FOR ENCODING AND TRANSMITTING INFORMATION

Josef Dirr, Neufahrner Str. 5, D81679 Munich, Germany

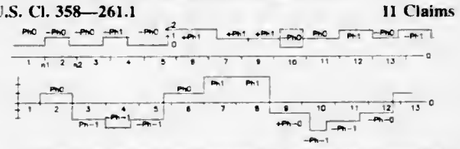
PCT No. PCT/EP93/03088, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO94/00973, PCT Pub. Date Jan. 20, 1994

PCT Filed Nov. 5, 1993, Ser. No. 50,402

Claims priority, application Germany, Nov. 6, 1992, 42 37 547.9; Dec. 23, 1992, 42 43 899.3; Aug. 11, 1993, 43 26 997.4

Int. Cl.[6] H04N *1/419;* **G08C** *19/12*

U.S. Cl. 358—261.1 **11 Claims**



1. Method for coding and transmitting information comprising:

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generating a multilevel phase coding by providing an alternating current of constant frequency and constant phase and providing pulses of predetermined length as code elements, represented by half-periods or periods of said alternating current of said frequency, which pulses are transmitted in an uninterrupted series, a change of phase of said pulses being obtained by increasing or decreasing the numbers of half-periods or periods in relation to the number of half-periods or periods of the preceding pulse, or providing the difference phase as code element, for which the preceding code element is used as a reference, wherein also a leading or lagging phase in relation to the reference phase or in relation to the preceding impulse phase is used as level criterion

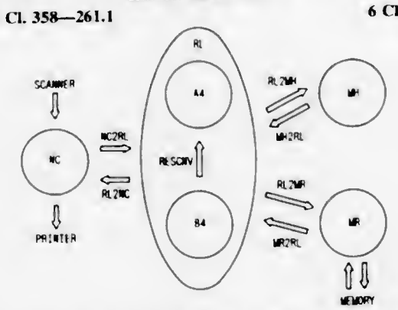
and a change of phase level which cannot be distinguished is marked by a change of the amplitude of said alternating current.

5,587,798

ENCODING AND DECODING METHODS FOR USE IN FACSIMILE

Kazuo Kurita, Nagano; Mikio Mizutani, Tokyo; Nobuhiko Noma, Yokohama; Tsukasa Sakai, Tokyo; Osamu Noguchi, Tokyo; Hiroyuki Nemoto, Tokyo, and Keiichi Tamita, Tokyo, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Continuation of Ser. No. 923,772, Aug. 3, 1992, abandoned.
This application Nov. 13, 1995, Ser. No. 556,571
Claims priority, application Japan, Aug. 1, 1991, 3-192010
Int. Cl.[6] H04N *1/32*
U.S. Cl. 358—261.1 **6 Claims**



1. A computer implemented method of encoding and decoding image data used in facsimile for converting raw data representing an image to Modified Huffman code data representing the image, comprising the steps of:

(1) performing by the computer a first program sequence from a memory for converting the raw data to cumulative run-length coded data including a plurality of run data representing runs of pixels in the image, and for including in the run data for a run:

(a) first data representing whether all pixels in the run are white or black; and

(b) second data representing where the run lies in the image; and

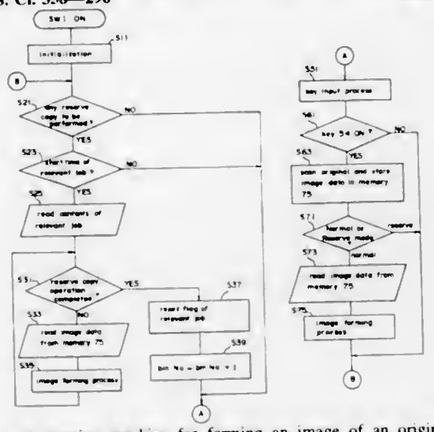
(2) performing by the computer a second program sequence from the memory for converting the cumulative run-length code data into Modified Huffman code data representing the image.

5,587,799

COPYING MACHINE WITH RESERVED COPYING AT A PREDETERMINED TIME PERIOD

Motomi Kawamura, Aichi-ken; Masamichi Kishi, and Takeshi Morikawa, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1993, Ser. No. 99,937
Claims priority, application Japan, Aug. 1, 1992, 4-225089
Int. Cl.[6] H04N *1/00;1/21;* **G03G** *21/00*
U.S. Cl. 358—296 **27 Claims**



1. A copying machine for forming an image of an original document on a sheet, comprising:

image reading means for reading an image of an original document and for generating image data corresponding to the image of said original document, said image reading means being operable under a normal mode and under a reserve mode;

memory means for storing said image data read by said image reading means;

image forming means for forming an image on a sheet based on said data stored in said memory means;

clocking means for clocking time;

judging means for judging whether or not the time being clocked by said clocking means reaches a predetermined time; and

controlling means for controlling said image forming means to start the image formation on a sheet based on said image data, which is read by said image reading means under said reserve mode, stored in said memory means when the time clocked by said clocking means reaches the predetermined time.

5,587,800

IMAGE PROCESSING METHOD AND APPARATUS

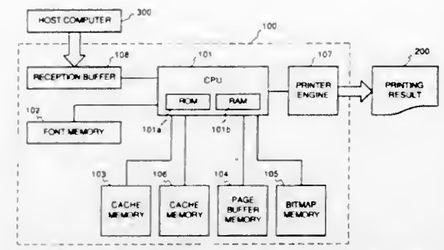
Yuki Miyazaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 7,103, Jan. 21, 1993, abandoned. This application Mar. 15, 1995, Ser. No. 405,377
Claims priority, application Japan, Jan. 29, 1992, 4-013631; Jan. 13, 1993, 5-003918
Int. Cl.[6] H04N *1/21*
U.S. Cl. 358—296 **33 Claims**

1. An image processing method of forming a new image by overlaying an image based on inputted data on a standardized form image which has been pre-registered, comprising:

an input step of inputting data corresponding to the image overlaid on the form;

a first discrimination step of discriminating whether or not pattern data corresponding to the data inputted in said input step is stored in a first area of a storage medium;



a first mapping step of mapping the input data in the first area using an outline font based on the discrimination result in said first discrimination step;

a second discrimination step of discriminating whether or not the pattern data included in the form is stored in a second area of the storage medium;

a second mapping step of mapping the form in the second area using an outline font based on the discrimination result in said second discrimination step;

a third mapping step of bitmapping the patterns mapped in said first and second mapping steps in a bitmap memory; and

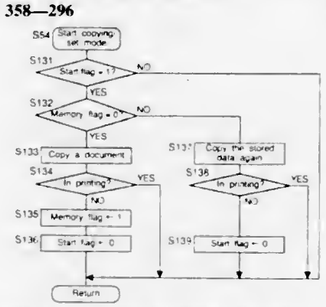
an output step of outputting the bitmapped pattern.

5,587,801

DIGITAL IMAGE FORMING APPARATUS

Nobuo Kamei, Toyokawa; Yoshikazu Ikenoue, Toyohashi, and Hideo Yamamoto, Hiratsuka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 78,464, Jun. 18, 1993, abandoned. This application Feb. 6, 1996, Ser. No. 595,940
Claims priority, application Japan, Jun. 19, 1992, 4-160793
Int. Cl.[6] H04N *1/10*
U.S. Cl. 358—296 **24 Claims**



1. A digital image forming apparatus comprising:

a read means for reading an image of a document;

a document set means for setting a document at a prescribed reading position;

a memory means for storing data of the image read by said read means;

an image forming means for forming the image on a sheet of paper according to the data stored in said memory means;

a detection means for detecting whether or not the document is at the prescribed reading position;

determining means for determining if the document is removed from the prescribed reading position; and

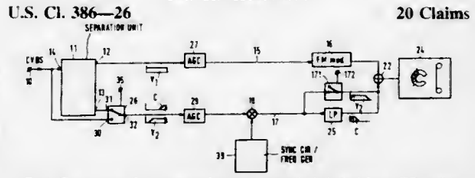
a clear means for automatically clearing the image data stored in said memory means when the determining means determines that the document has been removed from the prescribed reading position after said detection means detects that the document is at the prescribed reading position.

5,587,802

EXTENDED DEFINITION VIDEO SIGNAL CONVERTER FOR USE WITH A VIDEO RECORDER

Franciscus H. M. Bergen; Jan J. Rotte; Stephanus J. J. Nijssen, and Peter H. N. De With, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 869,290, Apr. 15, 1992, Pat. No. 5,293,248. This application Sep. 13, 1993, Ser. No. 120,987
Claims priority, application European Pat. Off., May 6, 1991, 91201070; Feb. 27, 1992, 92200566
Int. Cl.[6] H04N *9/79*
U.S. Cl. 386—26 **20 Claims**



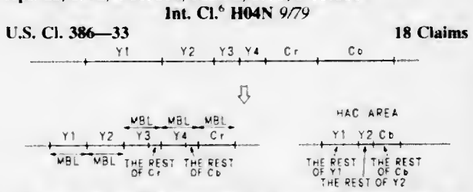
7. A Converter for converting an extended definition (ED) video signal into a video signal recordable on a video recorder, comprising: an input terminal for receiving the ED video signal which is in the form of pictures, each picture comprising first lines having a chrominance signal and a first luminance signal and second lines comprising a second luminance signal modulated with a suppressed carrier, a mixer stage and a signal combination unit with the input terminal coupled to a first input of the signal combination unit, via the mixer stage and, in addition, coupled to a second input of the signal combination unit via a path circumventing the mixer stage, wherein an output of the signal combination circuit is coupled to an output terminal, and the signal combination unit is arranged to supply the first luminance signal present in the first lines of the video signal and the second luminance signal present in the second lines in the ED video signal, and mixed in the mixer, to its output.

5,587,803

DIGITAL SIGNAL RECORDING AND REPRODUCING APPARATUS AND ERROR-CORRECTING APPARATUS

Tohru Inoue; Ken Onishi; Sadayuki Inoue, and Ikuo Okuma, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 37,372, Mar. 26, 1993, abandoned. This application May 2, 1995, Ser. No. 432,703
Claims priority, application Japan, Apr. 1, 1992, 4-079571; Apr. 28, 1992, 4-109804; Mar. 2, 1993, 5-067550
Int. Cl.[6] H04N *9/79*
U.S. Cl. 386—33 **18 Claims**



1. An error-correcting apparatus for correcting errors caused on a transmission channel and/or a recording medium, comprising:

means for grouping compressed data into macroblocks each consisting of a prescribed number of luminance signal blocks and a prescribed number of color-difference signal blocks and for placing the data in fixed positions in an error-correcting code; and

means for storing macroblocks of data in areas which correspond to each luminance and color-difference signal, each area having a prescribed number of bits and being filled completely with data of the corresponding one of the luminance signal and color-difference signals unless the data of the corresponding one of the luminance signal and color-difference signals is less than the prescribed number of bits, and for, when the length of at least one of the luminance signals and color-difference signals is smaller than the pre-

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scribed number of bits, forming blocks each consisting of the prescribed number of bits by filling a vacant space of an area, corresponding to the one of the luminance signals and color difference signals the length of which is less than the prescribed number of bits, with overflowing components from other luminance and color difference signals and thereafter performing error-correction coding on the data.

5,587,804

REPRODUCTION ERROR CORRECTION CIRCUIT FOR A VIDEO REPRODUCTION SYSTEM & THE METHOD FOR OPERATING IT

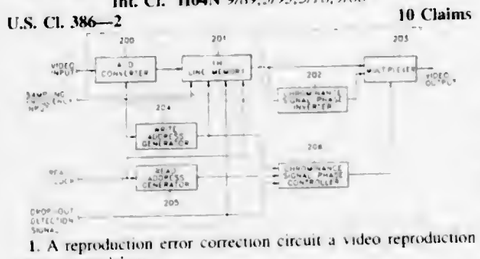
Byung-Joon Moon, Kyungki-do; Sung-il Cho, Incheon, and Ki-ho Shin, Kyungki-do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 26, 1994, Ser. No. 280,770

Claims priority, application Rep. of Korea, Jul. 28, 1993, 1993-14473

Int. Cl.[6] H04N *9/89;5/95;5/78;9/88*

U.S. Cl. 386—2 **10 Claims**



1. A reproduction error correction circuit a video reproduction system comprising:

storage means for storing image data of one horizontal scanning period by receiving an image digitized in response to a write clock signal,

write address generating means for sequentially generating write addresses for said storage means in response to said write clock signal;

read address generating means for sequentially generating read addresses for said storage means in response to a read clock signal;

a chrominance signal phase controlling means for controlling the phase of a chrominance signal by receiving a drop-out detecting signal, said read address signal and said write address signal;

a chrominance signal phase inverting means for inverting the phase of the chrominance signal by receiving the output signal of said storage means; and

selecting means for outputting the output signal of said storage means or outputting the output signal of said chrominance signal phase inverting means in response to the output signal of said chrominance signal phase controlling means.

5,587,805

METHOD FOR RECORDING IMAGES IN A DIGITAL VIDEO CASSETTE RECORDER

Ku-man Park, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

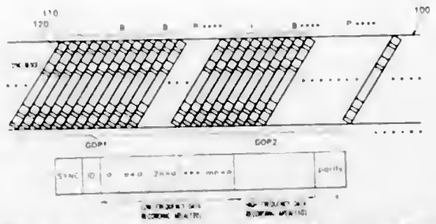
Filed Nov. 29, 1993, Ser. No. 158,827

Claims priority, application Rep. of Korea, Nov. 28, 1992, 92-22705; Oct. 15, 1993, 93-21451

Int. Cl.[6] H04N *5/92;5/782*

U.S. Cl. 386—68 **12 Claims**

4. A method for recording images in a digital video cassette recorder in which a compressed digital video signal of each sub-image of a picture divided into a predetermined number of sub-images is divided into low-frequency data and high-frequency data, so that low-frequency data is recorded in a low-frequency data recording area having a certain distance on each track of a



length of tape and the high-frequency data of a single corresponding sub-image is sequentially recorded on the remaining area of each track, characterized in that the predetermined number of sub-images is divided into a plurality of clusters in accordance with a predetermined method and then the low-frequency data for all sub-images belonging to a specific cluster are recorded together on the low-frequency data recording area of each sub-image belonging to said specific cluster.

5,587,806

APPARATUS FOR SEPARATELY RECORDING INPUT CODED VIDEO SIGNAL AND IMPORTANT DATA GENERATED THEREFROM

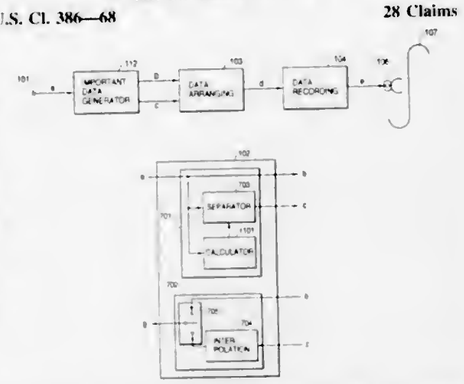
Masazumi Yamada, Moriguti; Shinya Kadono, Kobe, and Shiro Kato, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 21, 1994, Ser. No. 215,421

Claims priority, application Japan, Mar. 26, 1993, 5-068533; Apr. 7, 1993, 5-080492

Int. Cl.[6] H04N *5/76;5/78*

U.S. Cl. 386—68 **28 Claims**



1. A video signal recording apparatus for recording on a recording medium an input coded video signal containing intra-picture coded data and inter-picture coded data, comprising:

important data generating means for generating important data from a part of the input coded video signal that contains intra-picture coded data, said important data generating means outputting the input coded video signal as is as normal data;

data arranging means for arranging said important data and said normal data in such an order that said important data is recorded in a specific area of the recording medium and said normal data is recorded in the remaining area of the recording medium; and

data recording means for recording said important data and said normal data into said specific area and the remaining area, respectively, of the recording medium.

5,587,807

APPARATUS FOR PROCESSING DIGITAL VIDEO DATA WITH ERROR CORRECTION PARITY COMPRISING ERROR CONCEALMENT MEANS

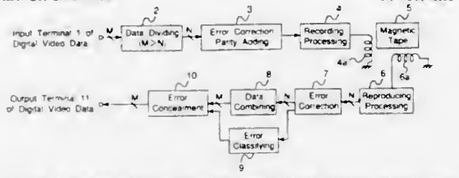
Takeshi Ootsuka, Kadoma, and Masaaki Higashida, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 4, 1994, Ser. No. 317,793

Claims priority, application Japan, Oct. 5, 1993, 5-249030

Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—46 **15 Claims**



1. An apparatus for processing input N-bit digital video data with an error correction parity, said input N-bit digital video data including each one sample of higher-order-N-bit data and a plurality of samples of lower-order-(M−N)-bit data, M being a predetermined natural number, N being a predetermined natural number smaller than the natural number M, said apparatus comprising:

error correction means for correcting an error of said input N-bit digital video data, outputting error-corrected N-bit digital video data, and generating and outputting an error detection signal representing an error which can not be corrected;

data combining means for converting said error-corrected N-bit digital video data outputted from said error correction means into M-bit digital video data by combining said each one sample of said higher-order-N-bit data and said plurality of samples of said lower-order-(M−N) -bit data included in said error-corrected N-bit digital video data so as to obtain said M-bit digital video data, and outputting converted M-bit digital video data;

error classifying means for classifying said error detection signal into a first error detection signal representing an error of said each one sample of said higher-order-N-bit data and a second error detection signal representing an error of said plurality of samples of said lower-order-(M−N)-bit data; and

error concealment means for performing an error concealment process for said converted M-bit digital video data outputted from said data combining means based on said first error detection signal outputted from said error classifying means.

5,587,808

IMAGE PROCESSING APPARATUS FOR IDENTIFYING CHARACTER, PHOTO AND DOT IMAGES IN IMAGE AREA

Hayato Hagihara, and Takahiro Hongu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 31, 1995, Ser. No. 455,623

Claims priority, application Japan, May 31, 1994, 6-117768

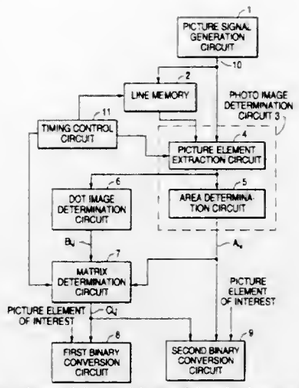
Int. Cl.[6] H04N *1/40;1/38*

U.S. Cl. 358—462 **4 Claims**

1. An image processing device for separating areas in an image in which character, dot and photo images are mixed comprising:

first determination means being supplied with picture signals representing an image, which contains a character, dot and photo, with multivalue data on picture element basis, for detecting the maximum and minimum values of the picture elements in a first matrix with a plurality of picture elements, and for determining whether said first matrix is a photo area or a provisional character area on the picture element basis according to result of comparison between said difference and a threshold;

second determination means for determining by using a second matrix with a plurality of picture elements, which partially overlaps said first matrix, whether or not variation of picture elements in said second matrix exceeds a predetermined amount; and,



means for determining said provisional character area as a character area and dot/photo area by a third matrix which is composed by using result of determination by said second determination means.

5,587,809

SYSTEM AND A PROCESS FOR TRANSMISSION OF SECURE FAXES

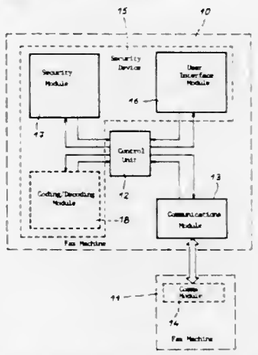
Hervé Le Corre, Eterville; Jean-Luc Grimault, Mondeville, and François Boudet, Fontenay le Marmion, all of France, assignors to France Telecom Etablissement Autonome de Droit Public, Paris, and La Poste, Boulognie Beillancourt Cedex, both of France

Continuation of Ser. No. 186,970, Jan. 27, 1994, abandoned. This application Jan. 3, 1996, Ser. No. 582,224

Claims priority, application France, Jan. 28, 1993, 93 00868

Int. Cl.[6] H04N *1/44*

U.S. Cl. 358—405 **1 Claim**



1. A process for secure transmission of a document with a "registered fax" notice, using a fax server, comprising the following steps:

a secure sending step (**22**) for sending the document to be faxed by a sending fax machine (**20**) to the server (**21**) wherein the sending fax machine gives the server a name of a recipient;

a sending step (**24**) in which the server sends the recipient a "registered fax" notice which has a reference number;

a recall step (**25**) following the sending step in which the recipient (**23**) recalls the server and is authenticated by the server by verifying the identity of the recipient and a digital signature of the recipient, and asks the server to send the document on a specific fax machine, with the document remaining available to the recipient for a predefined time; and

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an authentication step for authenticating the recipient by the server, sending (**26**) said document to the specific fax machine and sending (**27**) a receipt that the document was sent to the sending fax machine.

5,587,810

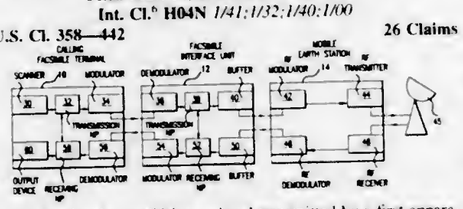
COMMUNICATION APPARATUS FOR DISABLING MESSAGES SPECIFYING NON-STANDARD COMMUNICATION FEATURES

Howard R. Feldman, Kenton, England, assignor to International Mobile Satellite Organization, London, England

Filed Mar. 14, 1994, Ser. No. 212,161

Int. Cl.[6] H04N *1/41;1/32;1/40;1/00*

U.S. Cl. 358—442 **26 Claims**



1. A device for modifying a signal transmitted by a first apparatus for reception by a second apparatus, said first apparatus supporting both a standard communications protocol and a non-standard communications protocol comprising:

means for receiving said signal from the first apparatus;

means for detecting a portion of said signal which identifies said non-standard communications protocol supported by the first apparatus;

means for replacing said portion with a predetermined signal; and

means for transmitting a modified signal derived from said received signal and including said predetermined signal in a protocol identifying field to the second apparatus, said modified signal identifying only said standard protocol.

5,587,811

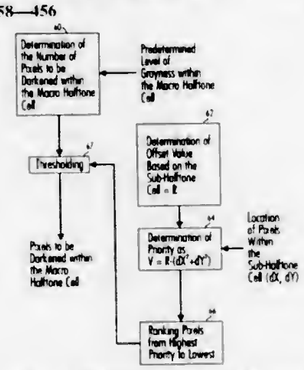
HALFTONE SCREEN USING SPOT FUNCTION TO RANK PIXELS FOLLOWING ONE OR MORE DESIGN RULES

Thomas A. Liguori, San Diego, Calif., assignor to Dataproducts Corporation, Simi Valley, Calif.

Filed Apr. 28, 1995, Ser. No. 430,881

Int. Cl.[6] H04N *1/405;1/52*

U.S. Cl. 358—456 **24 Claims**



5. A method for halftoning in an area of pixels, the method comprising:

partitioning the pixels into macro halftone cells, each macro halftone cell having a plurality of sub-halftone cells, each sub-halftone cell defining an area of contiguous pixels;

determining a quantity of pixels within a macro halftone cell to be darkened based on a predetermined level of grayness for the macro halftone cell; and

ranking the pixels within the macro halftone cell from highest to lowest in accordance with a spot function such that:

no two pixels within the same sub-halftone cell are ranked consecutively; and

the number of pixels ranked above any particular pixel within the sub-halftone cell is no more than one greater and no more than one less than the number of pixels ranked above said particular pixel in any other sub-halftone cell within the macro halftone cell.

5,587,812

FACSIMILE APPARATUS WITH COMMON SHEET CONVEYING PATH

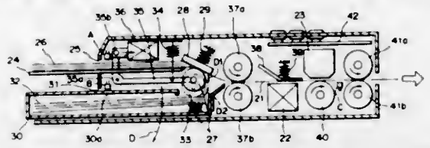
Michio Kasuya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,023

Claims priority, application Japan, Dec. 13, 1993, 5-312016; Oct. 20, 1994, 6-255245

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—498 **11 Claims**



1. A facsimile apparatus which has an original sheet conveying path for conveying an original and a recording sheet conveying path for conveying a recording sheet, comprising:

a common sheet conveying path for conveying either the original or the recording sheet, and which is provided downstream of the original sheet conveying path and the recording sheet conveying path;

feeder selection means, which is provided upstream of said common sheet conveying path, for picking-up either the original or the recording sheet by selection;

reading means, provided on said common sheet conveying path, for reading the original fed to said common sheet conveying path by said feeder selection means;

recording means, provided on said common sheet conveying path, for recording on the recording sheet fed to said common sheet conveying path by said feed selection means; and

ejecting means for ejecting the original and the recording sheet to the outside,

wherein said feeder selection means is always at a position where said means can select the original sheet, and has control means for changing the position upon conveying the recording sheet,

and wherein said control means does not change the position of said feeder selection means until conveyance of the original or recording sheet has been completed.

5,587,813

DATA TRANSFER DEVICE FOR AN IMAGE FORMING APPARATUS

Shuichi Yamazaki, Fujimi; Takashi Mama; Nobuyuki Sato, both of Yokohama; Takeshi Yamakawa, Fujisawa; Shinji Kobayashi; Yoshio Kaneko, both of Tokyo, and Koji Oshikiri, Natori, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

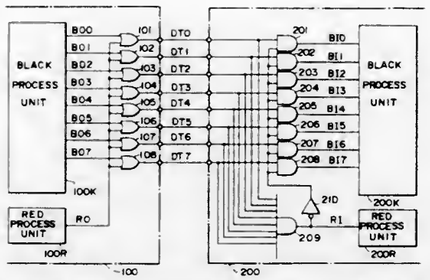
Filed Jul. 29, 1993, Ser. No. 98,940

Claims priority, application Japan, Jul. 31, 1992, 4-205706

Int. Cl.[6] H04N *1/00;1/46;7/12;* **G03F** *3/08*

U.S. Cl. 358—500 **16 Claims**

1. A data transfer device for an image forming apparatus, comprising:



a sending unit for outputting at different times at least first multilevel data of a first color and second multilevel data of a second color;

a plurality of data lines for communicating the first multilevel data and the second multilevel data output by the sending unit at different times;

a control unit for controlling whether the first multilevel data or whether the second multilevel data is communicated on the plurality of data lines; and

a receiving unit for receiving and separating the first multilevel data and the second multilevel data communicated on the plurality of data lines, wherein the receiving unit records on an image receiving material an image of the first color and an image of the second color at different times, such that the image of the first color and the image of the second color are superposed on each other.

5,587,814

COLOR IMAGE SENSOR INCLUDING PLURAL LIGHT-RECEIVING WINDOWS AND COLOR FILTERS

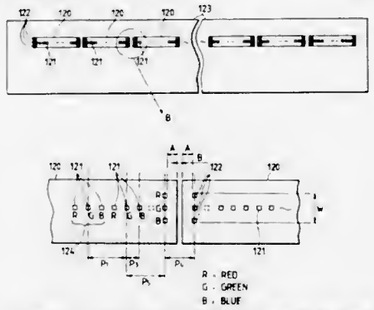
Akio Mihara, Isehara, and Seiji Hashimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 680,692, Apr. 4, 1991, Pat. No. 5,315,412. This application Jan. 12, 1994, Ser. No. 180,317

Claims priority, application Japan, Apr. 6, 1990, 2-90447; Apr. 9, 1990, 2-92050; Apr. 9, 1990, 2-92051; Apr. 9, 1990, 2-92052

Int. Cl.[6] H04N *1/46*

U.S. Cl. 358—512 **6 Claims**



1. A multi-chip color image sensor in which a plurality of semiconductor image sensors each having a plurality of light-receiving windows are arrayed, and a plurality of light-receiving windows in a main scanning direction constitute one color light-receiving element,

wherein a last light-receiving window or at least two light-receiving windows including the last light-receiving window of a first semiconductor image sensor of adjacent semiconductor image sensors, and a first light-receiving window or at least two light-receiving windows including the first light-receiving window of the next semiconductor image sensor constitute one color light-receiving element.

5,587,815

PHASE MODULATION HOLOGRAPHIC DEVICE FOR GENERATING TWO DIFFERENT WAVEFRONTS

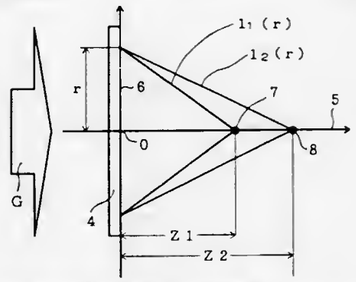
Akira Sato, Amagasaki, and Takuji Hatano, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1993, Ser. No. 122,372

Claims priority, application Japan, Sep. 17, 1992, 4-247424

Int. Cl.[6] G03H *1/12*

U.S. Cl. 359—11 **13 Claims**



1. A phase modulating device, comprising:

a substrate having a binarized surface configuration defined by the following equations:

$$B(r)=\pi(PTH(r)\leqq P(r)<2\pi) \text{ or}$$

$$B(r)=0(0\leqq P(r)<PTH(r))$$

$$PTH(r)=2\sin^{-1}\eta(r)^{-1/2}$$

wherein P(r) is the phase difference distribution and B(r) is the binarized surface configuration at coordinate r along a diameter of the substrate, η(r) is a diffraction efficiency distribution, and PTH(r) is a threshold value for binarization.

5,587,816

LCD DEVICE INCLUDING AN ILLUMINATION DEVICE HAVING A POLARIZED LIGHT SEPARATING SHEET BETWEEN A LIGHT GUIDE AND THE DISPLAY

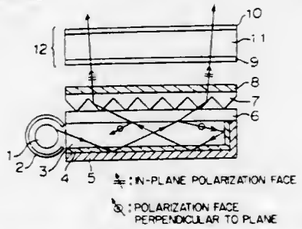
Tomoki Gunjima; Yoshiharu Ooi; Masao Ozeki, all of Yokohama; Hiroaki Ito, Kawasaki; Hiroshi Hasebe, Tokyo; Tetsuro Matsumoto, and Yutaka Nakagawa, both of Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 132,864, Oct. 7, 1993, abandoned. This application Oct. 19, 1995, Ser. No. 530,012

Claims priority, application Japan, Oct. 9, 1992, 4-298021; Feb. 17, 1993, 5-051594; May 28, 1993, 5-151260; Jun. 2, 1993, 5-156142

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 349—62 **18 Claims**



1. An illumination device for a direct viewing type display element, comprising:

a flat light guide;

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a light source set such that light is incident on a side portion of said flat light guide;

a polarized light separating sheet set on a light emitting side of the flat light guide for transmitting a p polarized light component and reflecting at least a portion of an s polarized light component with respect to a light ray substantially having a predetermined direction of incidence; and

a light reflecting sheet disposed on another side opposite to and facing said light emitting side of the flat light guide in parallel with the emitting side, said light reflecting sheet converting said portion of s polarized light component reflected by said polarized light separating sheet into p polarized light and reflecting the converted p polarized light to said polarized light separating sheet for transmission of the converted p polarized light through said polarized light separating sheet in overlapping relationship with the p polarized light component.

5,587,817

LIQUID CRYSTAL PANEL UNIT HAVING LIQUID CRYSTAL PANEL AFFIXED TO PANEL FIXING USING ADHESIVE AND HEIGHT-REGULATING PINS

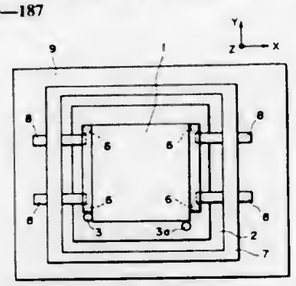
Takao Miyamoto, Chigasaki, and Hisao Tajima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 63,541, May 19, 1993, Pat. No. 5,329,391. This application Apr. 15, 1994, Ser. No. 228,274

Claims priority, application Japan, May 20, 1992, 4-151256

Int. Cl.[6] G02F *1/13;1/1333*

U.S. Cl. 349—187 **4 Claims**



1. A liquid crystal panel unit, comprising:

a panel-fixing plate;

a liquid crystal panel fixed onto the panel fixing plate with plural adhesive pieces; and

observable traces of a plurality of removed height-regulating pins disposed in the neighborhood of the adhesive pieces on a face of the panel-fixing plate opposing the liquid crystal panel.

5,587,818

THREE COLOR LCD WITH A BLACK MATRIX AND RED AND/OR BLUE FILTERS ON ONE SUBSTRATE AND WITH GREEN FILTERS AND RED AND/OR BLUE FILTERS ON THE OPPOSITE SUBSTRATE

Si-Hyun Lee, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

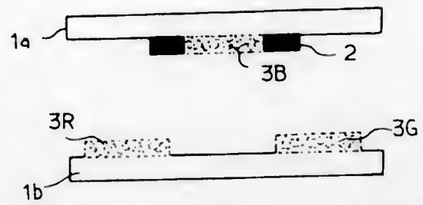
Filed Dec. 8, 1995, Ser. No. 569,697

Claims priority, application Rep. of Korea, Dec. 26, 1994, 94-36911

Int. Cl.[6] G02F *1/1335;1/1333*

U.S. Cl. 349—106 **2 Claims**

1. A liquid crystal display comprising a black matrix and a plurality of color (red, green and blue) filters formed on a pair of



opposite glass substrates, wherein filters of one or two colors other than green, are formed on one glass substrate with said black matrix, while filters of two or one color, respectively, including said green filter, are formed on the other glass substrate such that the edge of the color filters of the one glass substrate are aligned with the edge of the color filters of the other glass substrate.

5,587,819

DISPLAY DEVICE

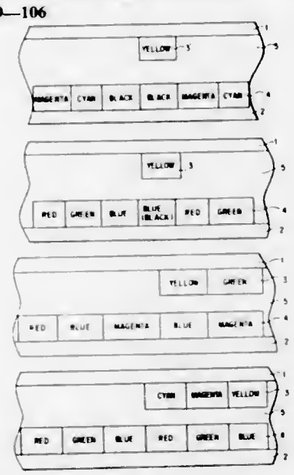
Kazuyuki Sunohara; Rei Hasegawa; Hiroyuki Nagata; Shinichi Sanada, and Yasushi Kawata, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1994, Ser. No. 364,750

Claims priority, application Japan, Dec. 27, 1993, 5-348499; Jun. 20, 1994, 6-137390

Int. Cl.[6] G02F *1/1335;1/1333*

U.S. Cl. 349—106 **19 Claims**



19. A reflective direct-view type display device which comprises:

a first substrate having two major surfaces and electrode provided on a first major surface;

a second substrate having two major surfaces and color filter layers and pixel electrodes provided on a first major surface wherein said color filter layers comprise at least a black filter layer; and

a light-scattering medium interposed between said first and second substrates positioned with said electrode that opposes said pixel electrodes, and a yellow dye is disposed in that part of said light-scattering medium which opposes any part of the black filter layer.

5,587,820

INTEGRATED ELECTRO-OPTICAL LIQUID CRYSTAL DEVICE AND METHOD OF USING SUCH A DEVICE

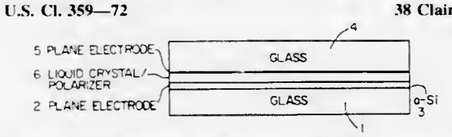
Paul May, Cambridge; Craig Tombling, Oxfordshire; Michael G. Robinson, Oxfordshire; Edward P. Raynes, Oxfordshire, and Jonathan Harrold, Oxfordshire, all of United Kingdom, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 22, 1994, Ser. No. 310,671

Claims priority, application United Kingdom, Sep. 23, 1993, 9319614; Jun. 7, 1994, 9411330

Int. Cl.[6] G02F *1/1343;1/135;1/137;* **H01J** *40/14*

U.S. Cl. 359—72 **38 Claims**



1. An integrated electro-optical device comprising a liquid crystal optical modulation layer, an opto-electronic detector layer, and means for absorbing polarized light superimposed over the detector layer, the absorbing means forming an integral polarization analyzer and the detector layer being arranged to detect a result of optical processing by the optical modulation layer via the absorbing means.

5,587,821

LIQUID CRYSTAL DISPLAY DEVICE HAVING A PARTICULAR COMPENSATOR

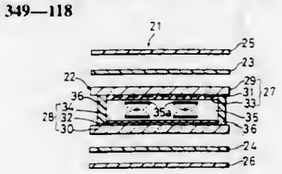
Hiroko Nakanishi, Uji, and Hiroshi Ohnishi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

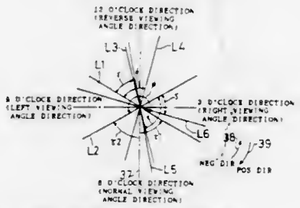
Filed Dec. 23, 1994, Ser. No. 363,377

Claims priority, application Japan, Dec. 27, 1993, 5-332681

Int. Cl.[6] G02F *1/1335;* **C09K** *19/02*

U.S. Cl. 349—118 **4 Claims**





1. A liquid crystal display device comprising:

a) a pair of polarizing plates;

b) a liquid crystal display element disposed between the pair of polarizing plates, the element including:

a pair of substitute members at least one of which is transparent, and a

a super twisted nematic-type liquid crystal layer of the liquid crystal molecules having a twist angle ϕ of 240°, the liquid crystal layer sandwiched between the substrate members,

the pair of substrate member each including both an electrode for applying a voltage to the liquid crystal layer and an orientation film in contact with the liquid crystal layer; and

c) phase difference plates placed between each of the pair of polarizing plates and the liquid crystal display element, wherein

the liquid crystal layer interposed between the electrodes is used as picture elements;

the liquid crystal molecules with different pretilt angles are mixed in a single picture element;

the phase difference plates are selected so that $nx \geqq nz > ny$ is satisfied and the value of Nz represented by $Nz=(nx-nz)/(nx-ny)$, where the Nz value is 0.2 and where nx, ny and nz are the refractive indices in the three-dimensional directions of each phase difference plate;

the angle γ contained by an orientation axis of liquid crystal molecules closest to the orientation film possessed by a one of the pair of substrate members and an absorption axis of the polarizing plate on the side of the one substrate member is selected to be in the range of 40° to 50°;

the angle δ contained by said orientation axis and the slow axis of the phase difference plate on the side of the one substrate member is selected to be in the range of 70° to 80°;

the angle ϵ contained by an orientation axis of liquid crystal molecules closest to the orientation film possessed by an other of the pair of substrate members and the slow axis of the phase difference plate on the side of the other substrate member is selected to be in the range of 100° to 110°; and

the angle ζ contained by the orientation axis of liquid crystal molecules closest to the orientation film possessed by the other of the pair of substrate members and an absorption axis of the polarizing plate on the side of the other substrate member is selected to be in the range of 40° to 50°.

5,587,822

LIQUID CRYSTAL ORIENTATION CONTROL LAYER METHOD AND APPARATUS FOR MANUFACTURING THE SAME AND MASK FOR USE IN THE MANUFACTURING

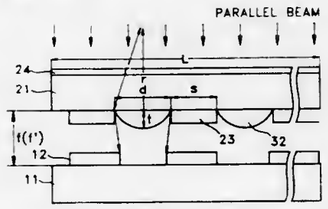
Jae-won Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 30, 1995, Ser. No. 380,862

Claims priority, application Rep. of Korea, Jan. 28, 1994, 94-1586

Int. Cl.[6] G02F *1/1337*

U.S. Cl. 349—124 **4 Claims**



1. A method for forming an orientation layer, comprising the steps of:

coating an orientation material in a predetermined thickness on a transparent substrate; and

forming a striped orientation layer such that a plurality of striped layers are simultaneously formed in parallel at a predetermined distance by evaporating exposed portions of said orientation layer by focusing striped light from a mask having a hemicircular microlens array onto said orientation layer.

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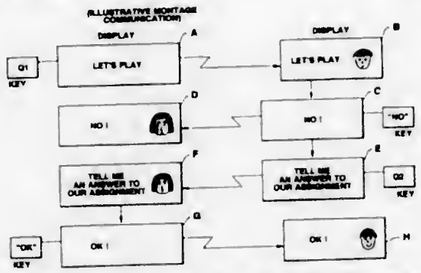
5,587,823
RADIO COMMUNICATION DEVICES

Hiroyuki Yoshino, Higashiyamato, and Takashi Kojo, Ome, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1993, Ser. No. 170,502
Claims priority, application Japan, Dec. 28, 1992, 4-349579
Int. Cl.[6] H04B *10/10*
U.S. Cl. 359—143 **5 Claims**



1. A radio communication device for exchanging data with another radio communication device, comprising:

image pattern data storage means for storing a plurality of image pattern data for each of parts of a face, the plurality of image pattern data corresponding respectively to a plurality of code data;

image pattern data selecting means for designating code data to select image pattern data from among the image pattern data stored in said image pattern data storage means, and for combining the selected image pattern data to obtain image data of a face;

image data storing means for storing image data of a face obtained by said image pattern data selecting means;

conversation sentence data storage means for storing a plurality of conversation sentence data, which correspond respectively to a plurality of code data;

conversation sentence selecting means for selecting one conversation sentence data from among the plurality of conversation sentence data stored in said conversation sentence data storage means;

sending means for sending to the another radio communication device by means of radio signals, code data of image pattern data included in the image data obtained by said image pattern data selecting means and code data of the conversation sentence data selected by said conversation sentence selecting means;

receiving means for receiving a radio signal of code data of image data and a radio signal of conversation sentence data, both sent from the another radio communication device;

reading means for reading out from said image pattern data storage means image pattern data corresponding to code data of the image data which are included in the radio signal received by said receiving means, and for reading out from said conversation sentence data storage means conversation sentence data corresponding to code data of the conversation sentence data received by said receiving means;

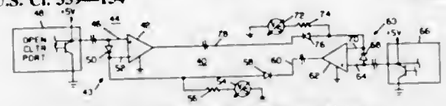
display means for displaying the image pattern data and the conversation sentence data, both read out by said reading means; and

display control means for controlling said reading means to read out from said image pattern data storage means image pattern data different from the image pattern data previously read out by said reading means, when the conversation sentence data read out by said reading means is a previously determined conversation sentence data, and for controlling said display means to display the image pattern data last read out by said reading means.

5,587,824
OPEN COLLECTOR COMMUNICATIONS LINK

Robert R. Asprey, Harvest, Ala., assignor to Cybex Computer Products Corporation, Huntsville, Ala.

Continuation-in-part of Ser. No. 736,568, Jul. 26, 1991, Pat. No. 5,323,420, which is a continuation-in-part of Ser. No. 55,829, Apr. 30, 1993, abandoned. This application Sep. 1, 1995, Ser. No. 524,189
Int. Cl.[6] H04B *1/52*
U.S. Cl. 359—154 **9 Claims**



1. A binary logic communications link comprising:

a first bidirectional, binary logic communications port and a remotely located second bidirectional, binary logic communications port;

a first conductor having a first end and a second end;

a second conductor having a first end and a second end;

first comparator means responsive to said first port for providing a first digital transition to said first end of said first conductor responsive to a first digital potential transition from said first port crossing a selected potential;

second comparator means responsive to said second port for providing a second digital transition to said first end of said second conductor responsive to a digital potential transition from said second port crossing a selected potential;

first voltage control means for providing a first logic level voltage;

second voltage control means for providing a first logic level voltage;

said second voltage control means being coupled to said second end of said first conductor and coupled to said second port and responsive to a said first digital transition from said first conductor and said first comparator means for asserting a said first logic level voltage at said second port, thereby communicating a said first digital transition from said first port to said second port;

said first voltage control means being coupled to said second end of said second conductor and coupled to said first port and being responsive to a said second digital transition from said second conductor and said second comparator means for asserting a said first logic level voltage at said first port, thereby communicating a second digital transition from said second port to said first port;

said second voltage control means includes means further responsive to said second end of said first conductor for effecting clamping of an output of said second comparator means to a second logic level state until said digital potential transitions asserted by said first port reverts to a quiescent logic level; and

said first voltage control means is further responsive to said second end of said second conductor for effecting a clamping of an output of said first comparator means to a second logic level state until said first digital potential transition asserted by said first port reverts to a quiescent logic level.

5,587,825
SCANNING OPTICAL SYSTEM

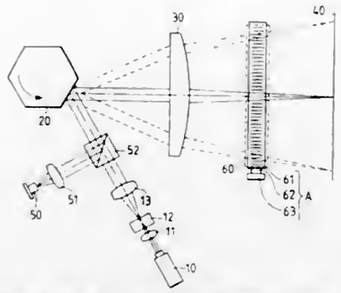
Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1992, Ser. No. 904,320
Claims priority, application Japan, Jun. 26, 1991, 3-252687; Apr. 21, 1992, 4-101383
Int. Cl.[6] G02B *26/08;* **H01J** *3/14;5/16;40/14*
U.S. Cl. 359—204 **16 Claims**

1. A scanning optical system comprising:

a writing beam source for generating a writing beam;

a monitoring beam source for generating a monitoring beam of a different wavelength than said writing beam;



combining means for combining said writing beam and said monitoring beam;

a deflector for deflecting and scanning the rays of light from each of said sources;

a scanning lens with which the rays of light deflected by said deflector are focused on an image plane;

an isolating means provided between said deflector and said image plane to isolate the monitoring beam from the optical path of the writing beam;

a signal generating means that receives the isolated monitoring beam to generate a monitor signal; and

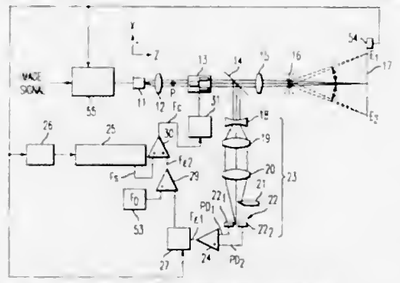
a photoreceptor disposed at said image plane,

wherein said monitoring beam has a wavelength which said photoreceptor is incapable of sensing.

5,587,826
OPTICAL BEAM SCANNING APPARATUS ADJUSTING FOCAL POINT OVER ENTIRE IMAGE FORMING AREA BY FEEDBACK CONTROL

Takashi Shibaguchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 420,507, Apr. 12, 1995, Pat. No. 5,541,761. This application Feb. 27, 1996, Ser. No. 607,456
Claims priority, application Japan, Apr. 14, 1994, 6-075813; Jun. 28, 1994, 6-146086
Int. Cl.[6] G02B *26/10*
U.S. Cl. 359—216 **7 Claims**



1. An optical beam scanning apparatus comprising:

a light source emitting a linearly polarized light beam;

deflecting means for deflecting the light beam toward a scanning surface on which an image is formed a scanning operation defined by the light beam projected from said deflecting means onto said scanning surface;

a first image forming optical system provided between said light source and said deflecting means focusing the light beam on said scanning surface, said first image forming optical system including an electrooptic lens having a variable focal distance so that a focal distance of said first image forming optical system is varied in synchronization with said scanning operation;

light beam splitting means for splitting the light beam after the light beam has passed through said electrooptic lens into a first split light beam and a second split light beam, said first split light beam being directed toward said deflecting means;

focal position detecting means for detecting a deviation of a focal position of said first split light beam relative to said scanning surface by use of said second split light beam, and for outputting a detection signal corresponding to the deviation of the focal position;

focusing signal supplying means for storing and supplying a focusing signal which corresponds to the detection signal obtained when a focal position of said first split light beam is positioned on said scanning surface;

direct current reference signal generating means for generating and outputting a direct current reference signal having a predetermined constant level;

differential signal generating means for generating a differential signal between the direct current reference signal output from said direct current reference signal generating means and the detection signal output from said focal position detecting means;

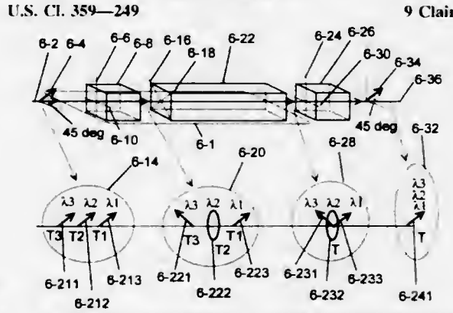
driving voltage generating means for generating a driving voltage supplied to said electrooptic lens, the driving voltage being controlled by a driving voltage controlling signal which is a sum of the differential signal output from said differential signal generating means and the focusing signal output from said focusing signal supplying means; and

synchronization signal generating means, provided adjacent to said scanning surface, for generating a synchronization signal by detecting the light beam projected from said deflecting means onto said scanning surface, the synchronization signal used for controlling starting timing for a scanning operation and an output timing for outputting the detection signal from said focal position detecting means so that the differential signal is output for each scanning period in the absence of an image being formed on said scanning surface.

5,587,827
APPARATUS FOR COMPENSATING CHROMATIC AND POLARIZATION DISPERSION AND FREQUENCY CHIRP IN FIBER OPTICS AND FOR PULSE COMPRESSION IN LASER SYSTEMS

Hosain Hakimi, and Farhad Hakimi, both of 131 Coolidge Ave., #627, Watertown, Mass. 02172

Filed Feb. 1, 1995, Ser. No. 381,741
Int. Cl.[6] G02F *1/03*
U.S. Cl. 359—249 **9 Claims**



1. Apparatus for compensating a predetermined amount of chromatic dispersion and polarization dispersion and frequency chirp in a lightwave signal, the apparatus comprising:

first means for transforming each wavelength component of the lightwave to different respective polarization states; and

second means to convert each different respective polarization state to a different respective time delay and wherein said second means to convert is connected to an output of the first transforming means for compensating chromatic dispersion and frequency chirp of the lightwave by inducing an amount of chromatic dispersion substantially equal in magnitude, and

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opposite in sign, to the predetermined amount of chromatic dispersion and polarization dispersion and frequency chirp.

wherein said filter comprises means for repeating said filtered signal.

5,587,828

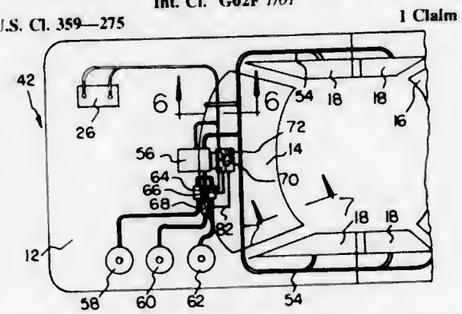
ADJUSTABLE WINDOW TINTING SYSTEM

Leroy A. Bernard, Jr., 2277 Evalon, Beaumont, Tex. 77703

Division of Ser. No. 87,577, Jul. 9, 1993, Pat. No. 5,390,045. This application Nov. 18, 1994, Ser. No. 342,167

Int. Cl.[6] G02F *1/01*

U.S. Cl. 359—275 **1 Claim**



1. A new adjustable window tinting system for a vehicle having a plurality of window glass, said system comprising:

a tinting means for selectively tinting at least one of said plurality of window glass for limiting a passage of light therethrough; the tinting means comprising an electochromatic glass, and rheostat, said rheostat being electrically connected to both said electrochromatic glass and a power source, the electrochromatic glass comprising a pair of glass panes positioned in a substantially coplanar relationship so as to define a space therebetween, a pair of conductors having a distance therebetween and disposed within said space, and an electrochromatic conductive polymer disposed within said space, said electrochromatic conductive polymer being in electrical communication with said pair of conductors, said electrochromatic conductive polymer comprising an oxidized conductive polymer selected from the group consisting of polyacetylene, poyerinaphthalene, and polynaphthalene.

5,587,829

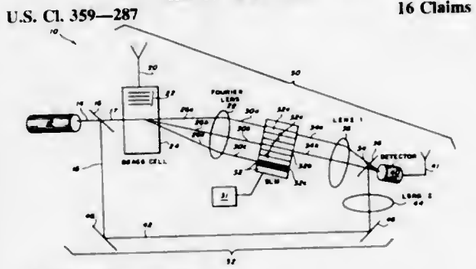
METHOD AND APPARATUS FOR SIGNAL FILTERING

Edward M. Alexander, Falls Church, Va., and Anthony E. Spezio, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1994, Ser. No. 296,883

Int. Cl.[6] G02F *1/11*

U.S. Cl. 359—287 **16 Claims**



1. A filter comprising:

means for receiving an input signal;

means for spatially dispersing said input signal according to frequency, to form a spatially dispersed optical signal; and

means for combining selected frequency components of said spatially dispersed signal into a resultant filtered signal;

5,587,830

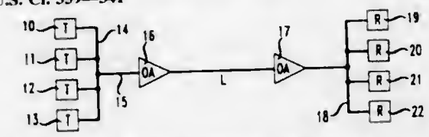
HIGH CAPACITY OPTICAL FIBER NETWORK

Andrew R. Chraplyvy, and Robert W. Tkach, both of Monmouth County, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 28, 1993, Ser. No. 69,952

Int. Cl.[6] H04B *10/12;* **G02B** *6/10;6/28*

U.S. Cl. 359—341 **10 Claims**



1. Wavelength division multiplexed optical waveguide system including:

a transmitter for generating, modulating, and multiplexing modulated channel carriers for introduction into a transmission line, the transmitter being characterized by a "system wavelength" of magnitude within the wavelength range of the grouped channel carriers; a receiver for performing functions including de-multiplexing modulated channel carriers; optical amplifiers; and a transmission line of optical fiber including at least one fiber span defined at one end by a transmitter and at the other end by a receiver, in which the span includes at least one optical amplifier

CHARACTERIZED IN THAT

substantially all fiber defining the span has a chromatic dispersion of an absolute value in the range 1.5–4 ps/nm-km at the system wavelength.

5,587,831

SEMICONDUCTOR FOIL BEAM-SPLITTER FOR AN INFRARED SPECTROMETER

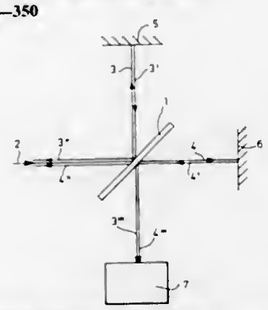
Arno Simon, Karlsruhe, and Jürgen Gast, Rheinstetten, both of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten, Germany

Filed Nov. 23, 1993, Ser. No. 156,430

Claims priority, application Germany, Dec. 16, 1992, 42 42 440.2

Int. Cl.[6] G02B *1/10*

U.S. Cl. 359—350 **6 Claims**



1. An infrared spectrometer comprising:

an incident beam having a wavelength in a far infrared optical region; and

a beamsplitter, the beamsplitter consisting essentially of a self-supporting foil material selected from the group consisting of carbon and an undoped semi-conductor, the foil material having a thickness less than the wavelength of the incident beam.

5,587,832

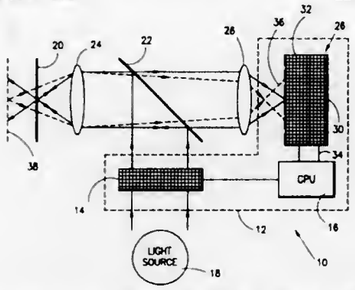
SPATIALLY LIGHT MODULATED CONFOCAL MICROSCOPE AND METHOD

Andrew W. Krause, Sparks, Md., assignor to Biophysica Technologies, Inc., Sparks, Md.

Filed Oct. 20, 1993, Ser. No. 138,067

Int. Cl.[6] G02B *21/06*

U.S. Cl. 359—385 **22 Claims**



1. A confocal optical imaging system for imaging a specimen comprising:

a light source for providing light to the specimen,

first optical means to direct light from said light source along an illumination path to said specimen,

pattern array means positioned in said illumination path between said light source and said specimen which operates to transform light from said light source into a plurality of simultaneously formed illumination spots arranged in a pattern, said pattern array means including an electronically addressed and gated electrostatic microshutter array operative in response to control signals to provide sequential patterns of illumination spots,

and a control means connected to said pattern array means, said control means operating to provide control signals to said pattern array means to cause said pattern array means to provide sequential complimentary patterns of illumination spots,

said first optical means operating to separately image each said pattern of illumination spots simultaneously on said specimen.

5,587,833

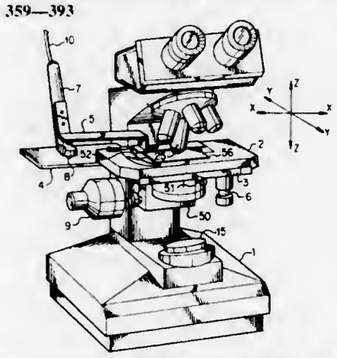
COMPUTERIZED MICROSCOPE SPECIMEN ENCODER

Louis A. Kamentsky, Boston, Mass., assignor to CompuCyte Corporation, Cambridge, Mass.

Filed Jul. 9, 1993, Ser. No. 89,243

Int. Cl.[6] G02B *21/26;21/34;* **G01J** *1/20;* **H04N** *7/18*

U.S. Cl. 359—393 **4 Claims**



1. A method for encoding of a specimen slide during scanning examination thereof with a microscope having viewing means and a moving slide stage, on which the specimen slide is mounted, and subsequent review of the scanning examination, the method comprising the steps of:

a) operatively linking a computer, with correlation movement sensor means, to the movable slide stage of the microscope, to correlatively record movement of the slide stage in an x-y direction plane in which the slide stage is movable, with said stage and viewing means being movable relative to each other in the z direction for focussing of the viewing means;

b) generating a computer image of a slide having the predetermined area of the specimen slide to be examined;

c) fixedly placing the specimen slide on the movable stage of the microscope;

d) moving the stage, with concomitant specimen slide movement, until a microscope viewing area is fixed on a predetermined starting location point on said specimen slide;

e) thereafter instructing the computer, operatively linked to said movable stage, to start to record subsequent movement in the x-y direction plane of the stage and specimen slide;

f) thereafter moving the stage, with concomitant specimen slide movement, away from the starting location point, with microscope examination of the specimen slide at various locations on the specimen slide; with the linked computer, pursuant to programmed instructions, recording the movement and various locations on the generated image of a slide and into computer storage medium;

g) causing the computer, pursuant to programmed instructions and an internal clock of the computer to automatically record, on computer storage medium, predetermined indicia on the computer generated image of a slide, at predetermined time intervals, determined by said internal clock, with said indicia correlating to the microscope viewing area location on the specimen, at the predetermined time intervals; and

h) optionally marking indicia of interest with a distinguishing marking for subsequent review recognition; and wherein said review of the scanning examination is effected by the steps of:

i) recalling the computer generated image of a slide with indicia thereon from the computer storage medium onto viewing means; and

ii) if indicia of interest have been marked with a distinguishing marking; placing the specimen slide on the movable slide stage of a microscope, operatively linked with a computer, by correlation movement sensor means;

iii) moving the stage, with concomitant specimen slide movement, until a microscope viewing area is fixed on a predetermined starting location point on said specimen slide;

iv) instructing the computer, operatively linked to said movable stage, to start to correlate microscope viewing area of the specimen slide to corresponding indicia on the computer generated image of a slide;

v) moving the stage, with concomitant specimen slide movement, away from the starting location point, with correlation of each subsequent microscope viewing area with indicia on the computer generated image, by indicator means, whereby correlated indicia having a distinguishing marking thereon is directly viewable with the microscope.

5,587,834

SEMICONDUCTOR DEVICE MANUFACTURING METHOD AND PROJECTION EXPOSURE APPARATUS USING THE SAME

Miyoko Noguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,789

Claims priority, application Japan, Jan. 31, 1992, 4-046265

Int. Cl.[6] G02B *5/18;27/00*

U.S. Cl. 359—558 **4 Claims**

3. A projection exposure apparatus comprising:

means for illuminating obliquely an original with a light beam having a main wavelength λ, the original having a grating-like pattern of opaque and light-transmissive areas, the grating-like pattern having a partially isolated pattern and an auxiliary

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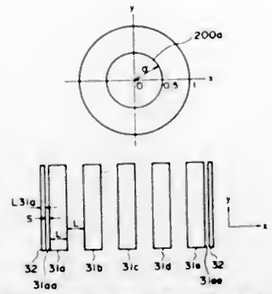


pattern, the partially isolated pattern being a pattern having, on at least one side thereof, no adjacent pattern other than an auxiliary pattern within a range of $D \leq (\lambda/NA)$, where λ is a wavelength of illuminating light, NA is a numerical aperture of an optical system and D is a distance from one side of the partially isolated pattern measured on an image plane, and the auxiliary pattern having a line width L which satisfies the relation $L \leq 0.2(\lambda/NA)$ and extending in a direction parallel to at least a portion of the partially isolated pattern, the auxiliary pattern being provided at a distance S from the one side of the partially isolated pattern in a direction substantially perpendicular to the one side, where S is within a range of $0 \leq S \leq 0.1(\lambda/NA)$; and

means for projecting a portion of light diffracted by the grating-like pattern onto a pupil plane of a projection optical system having a numerical aperture NA, to project the grating-like pattern onto a photosensitive plate in the image plane.

5,587,835

ANTIREFLECTION FILM AND DISPLAY APPARATUS

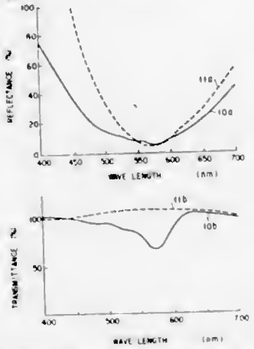
Kazuhiko Shimizu, Fukaya; Takeo Itou, Kumagaya, and Hidemi Matsuda, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 280,801, Jul. 26, 1994, abandoned, which is a continuation of Ser. No. 901,147, Jun. 19, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 391,477

Claims priority, application Japan, Jun. 19, 1991, 3-146438

Int. Cl.[6] G02B *5/28*

U.S. Cl. 359—589 **12 Claims**



1. An antireflection film coating comprising:

a substrate having an incident side surface on which unfiltered light is incident and an exit side surface on the opposite side of the substrate;

a first light-transmitting thin film, containing a coloring material therein, having a reflection side and an incident side, said reflection side contacting said incident side surface of said substrate, said reflection side reflecting said unfiltered light; and

a second light-transmitting thin film formed on said incident side of said first light-transmitting thin film, on which said unfiltered light is directly incident;

wherein said antireflection film coating has reflectance and transmittance characteristics that satisfy the relationship

$$\lambda r-50\ nm<\lambda r<\lambda t+70\ nm$$

where λr is a wavelength at which a spectral reflectance in a visible region is minimized, and λt is a wavelength at which a spectral transmittance in the visible region is minimized.

5,587,836

VISUAL DISPLAY APPARATUS

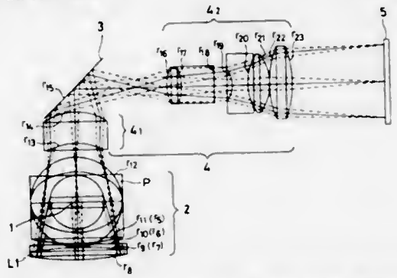
Koichi Takahashi, Hachioji, and Takayoshi Togino, Koganei, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 13, 1994, Ser. No. 242,630

Claims priority, application Japan, May 13, 1993, 5-111561

Int. Cl.[6] G02B *27/14;27/12*

U.S. Cl. 359—630 **12 Claims**



1. A visual display apparatus having a device for displaying an image;

a relay optical system for projecting the image displayed by said image display device to form a first image; and

an ocular optical system for projecting said first image in an observer's eyeball,

wherein said relay optical system has an optical system which is movable along an optical axis and enables a magnification to be changed between two different levels with an image position fixed by moving said movable optical system,

wherein when one of said two different levels of magnification is assumed to be β, the other magnification is approximately $1/\beta$; and

wherein said relay optical system has an optical member of positive power which satisfies the following condition:

$$1.1<R<2.25$$

where R is a ratio of two magnifications which are changeable from one to the other by movement of said relay optical system: $R=\beta_1/\beta_2$, where β_1 is a higher magnification and β_2 is a lower magnification.

5,587,837

BINOCULAR EYEPIECE WITH EXTENDED EYE RELIEF

Reynold S. Kebo, Los Angeles, Calif., assignor to Hughes Electronics, Los Angeles, Calif.

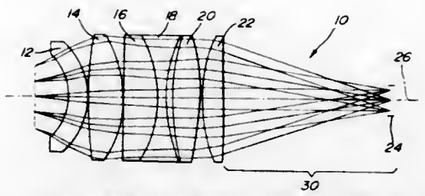
Filed Mar. 9, 1993, Ser. No. 28,516

Int. Cl.[6] G02B *25/00;9/60;9/62*

U.S. Cl. 359—643 **12 Claims**

1. A binocular eyepiece comprising:

a pair of optical systems, each system consisting of six lenses, one lens defining an optical axis and the remaining five lenses



centered on said axis, said lenses collimating said energy to an exit pupil positioned a desired distance away from the last lens providing extended eye relief, wherein said six lenses of each system are negative, positive, positive, negative, positive and positive power lenses.

5,587,838

PROJECTION LENS UNIT

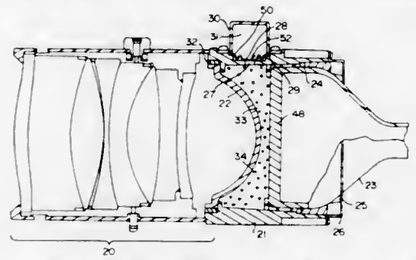
Takasi Kasihara, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 212,905, Mar. 15, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 606,866

Claims priority, application Japan, Mar. 16, 1993, 5-054541

Int. Cl.[6] G02B *3/00*

U.S. Cl. 359—649 **10 Claims**



1. An optical coupling arrangement for a display device comprising:

a display device for displaying a picture;

an optical coupling housing mounted to said display device, said optical coupling housing having an aperture therein covered by a movable diaphram;

an optical coupling lens mounted to said optical coupling housing with elastically deformable material;

a liquid-tight optical coupling chamber defined by said display device, said optical coupling housing and said optical coupling lens,

said optical coupling chamber filled with optical cooling liquid; and

an air tank filled with air mounted in an air-tight manner to said optical coupling housing over said movable diaphram,

wherein said movable diaphram moves according to pressure changes in said liquid-tight optical coupling chamber and said air absorbs said pressure changes.

5,587,839

OBJECTIVE LENS SYSTEM FOR ENDOSCOPE

Hitoshi Miyano, and Chikara Yamamoto, both of Saitama-ken, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

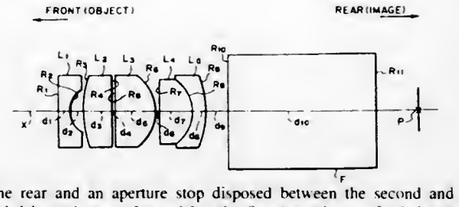
Filed Oct. 17, 1995, Ser. No. 544,003

Claims priority, application Japan, Oct. 18, 1994, 6-251976

Int. Cl.[6] G02B *21/02;9/34*

U.S. Cl. 359—660 **2 Claims**

1. An objective lens system for an endoscope comprising first to fifth lens elements L_1 to L_5 arranged in this order from the front to



the rear and an aperture stop disposed between the second and third lens elements L_2 and L_3, the first lens element L_1 being a negative lens concave to the rear, the second lens element L_2 being a positive lens having a flat surface facing rearward, the third lens element L_3 being a positive lens having a flat surface facing forward, the fourth lens element L_4 being a positive lens having a flat surface facing forward, the fifth lens element L_5 being a negative meniscus lens, the fourth and fifth lens elements L_4 and L_5 being cemented together to form a cemented lens having a positive refracting power wherein the following formulae (1) to (3) are satisfied,

$$0.75<|f_1\times Bf|/f^2<1.45 \quad (1)$$

$$D_t<|R_t| \quad (2)$$

$$\upsilon_2<45 \quad (3)$$

wherein f_1 represents the focal length of the first lens element L_1, Bf represents the back focal length of the overall objective lens system, f represents the combined focal length of the overall objective lens system, D_t represents the central thickness of an lens element L_t having a convex face, R_t represents the radius of curvature of the convex face of an lens element Li having a convex face and υ_2 represents the Abbe's number of the second lens element L_2.

5,587,840

ZOOM LENS

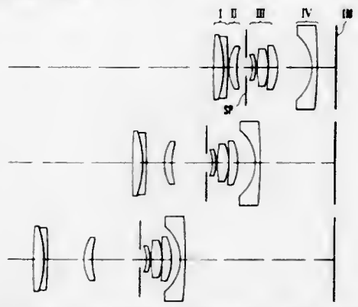
Yoshinori Itoh, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1995, Ser. No. 505,911

Claims priority, application Japan, Jul. 29, 1994, 6-178503; Jun. 29, 1995, 7-163671; Jun. 29, 1995, 7-163672

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—686 **32 Claims**



1. A zoom lens comprising, from front to rear, a first lens unit having a negative refractive power, a second lens unit having a positive refractive power, a third lens unit having a positive refractive power and a fourth lens unit having a negative refractive power, wherein zooming from a wide-angle end to a telephoto end is performed in such a manner that an air separation between said first lens unit and said second lens unit increases, an air separation between said second lens unit and said third lens unit increases and an air separation between said third lens unit and said fourth lens unit decreases.

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5,587,841

ZOOM LENS SYSTEM

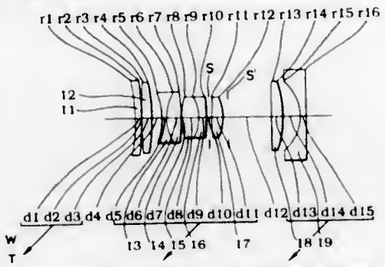
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,093

Claims priority, application Japan, Jul. 27, 1993, 5-184622

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—689 **15 Claims**



7. A zoom lens system comprising at least three lens groups including:

a positive first lens group comprising a positive lens;

a positive second lens group comprising a negative lens assembly including a negative lens and a positive lens assembly including a positive lens arranged in this order from the object to be photographed; and,

a negative third lens group;

said first, second and third lens groups being arranged in this order from said object, distances between each lens group changing during a zooming operation;

a half angle of view at a wide angle extremity of said whole lens system being approximately 37 degrees; wherein said lens groups satisfy the following relationships:

$0<f_w/f_1<0.5$

$1.7<N_{1p}$

$1.75<N_{2aN}$

$1.7<N_{2bP}$

wherein f_w is a focal length of the whole lens system at the wide angle extremity;

f_1 is a focal length of said positive first lens group;

N_{1p} is a refractive index of said positive lens of said positive first lens group;

N_{2aN} is a refractive index of said negative lens of said negative lens assembly of said positive second lens group; and

N_{2bP} is a refractive index of said positive lens of said positive lens assembly of said second positive lens group.

5,587,842

LENS CONTROL SYSTEM

Ryunosuke Iijima, Ebina, and Kitahiro Kaneda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 902,922, Jun. 23, 1992, abandoned, which is a continuation of Ser. No. 667,191, Mar. 8, 1991, Pat. No. 5,144,492. This application Nov. 22, 1993, Ser. No. 156,797

Claims priority, application Japan, Mar. 12, 1990, 2-62300; Sep. 17, 1990, 2-248185; Sep. 17, 1990, 2-248187

Int. Cl.[6] G02B *15/14*

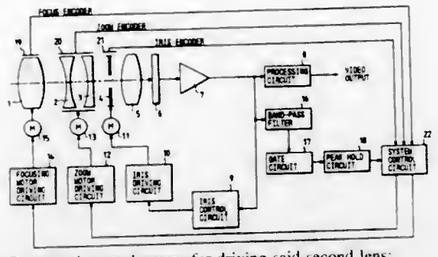
U.S. Cl. 359—698 **29 Claims**

1. A lens control apparatus comprising:

(A) a first lens;

(B) first control means for driving said first lens;

(C) a second lens whose movement range is different from a movement range of said first lens;



(D) second control means for driving said second lens;

(E) memory means for storing a position of said first lens; and

(F) third control means having a first mode in which said first and second control means are operated simultaneously and a second mode in which only one of said first and second control means is operated, and changing a function of said first or second lens for selectively switching said first or second modes according to a position of said second lens and storing the position of said first lens in said memory means in response to the switching from said first mode to said second mode, then moving said first lens to a reference position and moving said first lens to the position stored in said memory means in response to the switching from said second mode to said first mode.

5,587,843

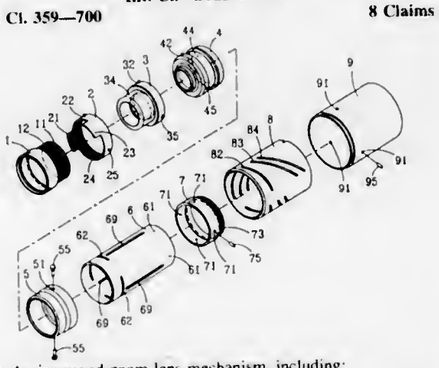
ZOOM LENS MECHANISM

Jim Chen, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 6, 1995, Ser. No. 470,601

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—700 **8 Claims**



1. An improved zoom lens mechanism, including:

a focusing ring having a plurality of focusing pins;

a first barrel with longitudinal slots, said first barrel is interconnected with a rear portion of said focusing ring, and contains a plurality of transverse slots at a front portion thereof respectively matching said focusing pins, said first barrel also contains a plurality of longitudinal slots, generally diametrically opposing each other;

an outer ring which is disposed at the front portion said first barrel, said outer ring is provided with a plurality of straight slots providing passages for said focusing pins;

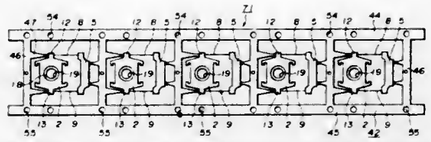
an inner ring which is disposed at a rear portion of said outer ring, said inner ring is attached at a rear end of said first barrel, said inner ring is interconnected with said outer ring, both said inner and outer rings are provided with a plurality of beads; and each of said beads can penetrate through said longitudinal slots of said first barrel;

a second barrel with spiral slots which is disposed at an outer portion of said first barrel, said second barrel has a front end portion which is provided with a plurality of first contour holes for receiving respective beads disposed within said inner ring, said front portion of said second barrel is also provided with a second and third contour holes which are disposed adjacent to said first contour hole;

a third barrel which is provided with a plurality of beads at a surface thereof, each of said beads can penetrate through said longitudinal slots of said first barrel and be received by said second contour holes of said first barrel; and

a fourth barrel which is provided with a plurality of beads at its surface, each of said beads can penetrate through said longitudinal slots of said first barrel and be received within said third contour holes of said first barrel;

whereby the provisions of said longitudinal straight slots diametrically provided at said first barrel, and said second barrel with said spiral slots and said contour holes allow an outer diameter of said lens mechanism to be reduced.



first and second parallel strip-shaped portions each being formed with positioning holes and interconnected by plural connecting pieces, and

a plurality of bobbin halves integrally molded with a plurality of base pieces integrally formed with at least one of said first and second strip-shaped portions.

5,587,844

ALBADA TYPE INVERTED GALILEAN FINDER FOR CAMERA

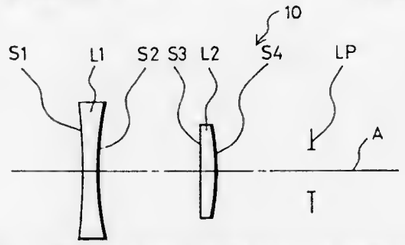
Kazunori Ohno, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Sep. 13, 1994, Ser. No. 305,433

Claims priority, application Japan, Sep. 21, 1993, 5-257766

Int. Cl.[6] G02B *13/18;* **G03B** *13/02;13/08*

U.S. Cl. 359—717 **5 Claims**



1. An Albada type inverted Galilean finder lens system for a camera, comprising:

an objective lens element of negative power having a concave surface on a pupil side opposite an object side which is provided thereon with a half mirror coating; and

an eyepiece element having a convex surface on said pupil side and a surface on said object side which is provided thereon with a framing marking defining an area for framing;

said finder lens system satisfying the following conditions:

(1) $4.0< f_2/L<7.0$

(2) $2.0< R_2/d_2< 2.7$

(3) $0.5< R_2/|R_4|< 2.7$

where

L is the overall length of said finder lens system;

R_2 is the radius of said concave surface of said objective lens element;

R_4 is the radius of said convex surface of said eyepiece;

f_2 is the focal length of said eyepiece element; and

d_2 is the axial distance between said objective lens element and said eyepiece element.

5,587,845

OBJECT LENS HOLDER

Yoshimasa Goda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 237,472, May 3, 1994, Pat. No. 5,555,623, which is a division of Ser. No. 871,661, Apr. 21, 1992, Pat. No. 5,381,273. This application Jun. 1, 1995, Ser. No. 457,371

Claims priority, application Japan, Apr. 26, 1991, 3-123030

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—819 **6 Claims**

1. A block of object lens holders comprising plural interconnected object lens holders, said block comprising:

5,587,846

LENS MOVING APPARATUS

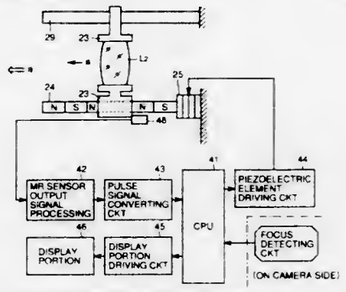
Masaaki Miyano, Sakai; Toyotoshi Kawasaki, Kawachinagano; Minoru Kuwana, Osaka; Masayuki Miyazawa, Kawachinagano; Masayuki Ueyama, Takarazuka, and Yoshihiro Tasaka, Toyonaka, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jul. 14, 1995, Ser. No. 502,833

Claims priority, application Japan, Jul. 15, 1994, 6-185217; Jul. 15, 1994, 6-185219; Sep. 21, 1994, 6-226957; Sep. 21, 1994, 6-226958

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—824 **28 Claims**



28. A lens moving apparatus, comprising:

a piezoelectric element which vibrates and deforms upon application of a voltage,

one end of said piezoelectric element being fixedly supported and the other end being a free end displaceable upon application of the voltage to the piezoelectric element;

a lens driving member coupled to said the other end of said piezoelectric element and operates in association with vibration and deformation of said piezoelectric element,

said lens driving member driving a lens holder holding said lens slidably in a direction of an optical axis of the lens;

a magnetized member having N poles and S poles arranged alternately at a prescribed interval along the direction of the optical axis of said lens;

a pair of magneto-resistive elements fixed at a position near the magnetized member on said lens holder, a magnetic resistance of said pair of magneto-resistive elements changing as said lens holder slides, said change in magnetic resistance including a phase difference;

a controller for calculating ratio of change of the magnetic resistance having phase difference, and for forming a new signal based on the ratio;

a detector for detecting position of the lens based on the signal formed by said controller; and

displaying means for visually displaying position of the lens detected by the detector.

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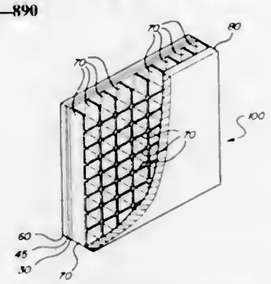
5,587,847

LASER PROTECTION WINDOW USING HOLOGRAPHIC OPTICAL ELEMENT AND CHANNEL PLATES

Byung J. Chang, Ann Arbor, and James M. Tedesco, Livonia, both of Mich., assignors to Kaiser Optical Systems, Ann Arbor, Mich.

Continuation of Ser. No. 163,555, Mar. 3, 1988, abandoned.
This application Aug. 14, 1990, Ser. No. 578,511
Int. Cl.[6] G02B *5/22;* **B32B** *3/10*
U.S. Cl. 359—890 **30 Claims**



1. A laser protection window for protection of an eye having no fixed position relative to the laser protection window from an expected laser threat comprising:

a planar holographic optical element having interference fringes embedded therein for forming a reflection hologram at the wavelength of the expected laser threat; and

a set of channel plates disposed at regular intervals at right angles to said holographic optical element, each of said channel plates opaque to light at said wavelength of the expected laser threat;

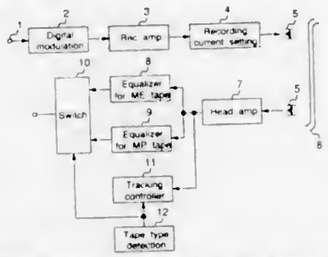
wherehy said set of channel plates cooperate to block all incoming light arriving at angles for which said holographic optical element does not reflect said wavelength of the expected laser threat from reaching the eye regardless of the position of the eye behind said laser protection window and further cooperate to permit substantially all incoming light passed by said holographic optical element arriving at angles for which said holographic optical element reflects said wavelength of the expected laser threat to reach the eye regardless of the position of the eye behind said laser protection window.

5,587,848

DIGITAL SIGNAL MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR BOTH METAL EVAPORATION TAPES AND METAL POWDER TAPES

Masafumi Shimotashiro, and Akio Kuroe, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 18, 1995, Ser. No. 423,727
Claims priority, application Japan, Apr. 18, 1994, 6-078342
Int. Cl.[6] G11B *5/09*
U.S. Cl. 360—46 **5 Claims**



1. A magnetic recording apparatus for digital signals, said apparatus comprising:

a metal powder tape having a magnetic layer, said magnetic layer having a thickness of 0.2 μm or less and a coercive force of 2,000 Oe or more;

a magnetic head for recording signals onto said metal powder tape; and

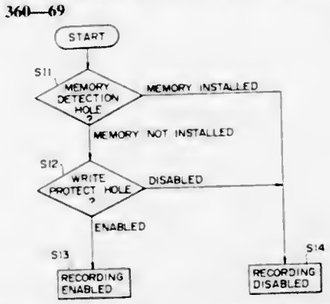
a recording current setting circuit for supplying a recording current to said magnetic head according to input digital signals, a value of the recording current being 4 dB higher than that necessary to obtain 90% of a maximum output level at a shortest wavelength to be recorded for a reference metal evaporation tape of a predetermined digital video cassette recording consumer use standard.

5,587,849

MECHANISM FOR SECURING RECORDED CONTENTS OF RECORDING MEDIUM CASSETTE

Teruhiko Kori; Hiroshi Yamazaki, both of Kanagawa; Harumi Kawamura, Tokyo; Hisato Shima, Chiba, and Kazuyuki Ogawa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 140,259, Oct. 21, 1993, abandoned.
This application Jul. 14, 1995, Ser. No. 502,467
Claims priority, application Japan, Oct. 22, 1992, 4-284706
Int. Cl.[6] G11B *15/18;17/00;11/02;27/36*
U.S. Cl. 360—69 **2 Claims**



1. Apparatus for securing data recorded on a recording medium housed in a cassette wherein said cassette is provided with data recording enable/disable means for enabling and disabling recording on said recording medium and may or may not be provided with a memory for storing information about data recorded on said recording medium, said apparatus comprising:

recording means;

state detecting means for producing a state detection signal representing the state of said enable/disable means;

memory detecting means for producing a memory detection signal representing a presence or an absence of a memory in said cassette; and

microcomputer means for disabling recording by said recording means in response to a memory detection signal indicating the presence of a memory in said cassette;

disabling of recording by said recording means in response to a memory detection signal indicating the absence of a memory in said cassette and a state detection signal indicating that said enable/disable means is in a disable state; and

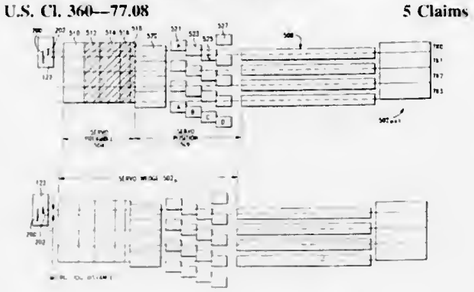
enabling recording by said recording means in response to a memory detection signal indicating the absence of a memory in said cassette and a state detection signal indicating that said enable/disable means is in an enable state.

5,587,850

DATA TRACK PATTERN INCLUDING EMBEDDED SERVO SECTORS FOR MAGNETO-RESISTIVE READ/INDUCTIVE WRITE HEAD STRUCTURE FOR A DISK DRIVE

Luan Ton-that, San Jose, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Aug. 26, 1994, Ser. No. 296,643
Int. Cl.[6] G11B *5/596*
U.S. Cl. 360—77.08 **5 Claims**



1. In a disk drive including a magnetic data storage disk rotating relative to a base, a data transducer assembly positioned at concentric data track locations by a rotary actuator referenced to the base and controlled by a closed loop servo circuit, the data transducer assembly including a write element, and a read element offset longitudinally from the write element such that when at least some of the track locations are being accessed by the data transducer assembly, a centerline of a magnetic path on the disk read by the read element is offset from a centerline of a magnetic path written to the disk by the write element by a micro-jog distance, and a plurality of servo wedges embedded within the data tracks wherein each servo wedge includes a servo preamble, a single servo identification field, and a plurality of circumferentially sequential, radially offset servo bursts, an improved method for centering the data transducer assembly relative to a centerline of a track to be followed, the method comprising the steps of:

for each servo wedge and each track, forming a respective servo preamble at a first radial displacement relative to the centerline of the track, forming a respective single servo identification field at a second radial displacement related to the micro-jog distance from the centerline of the track, and forming at least a pair of servo bursts to have oppositely facing burst edges in registration, the oppositely facing burst edges being offset from the centerline of the track by the micro-jog distance,

during disk drive data writing operations, reading with the read element the respective servo preamble, the respective single servo identification field, and the pair of servo bursts to obtain relative burst amplitudes therefrom in order to supply write-mode position error signals to the closed loop servo circuit to align the write element with the centerline, and

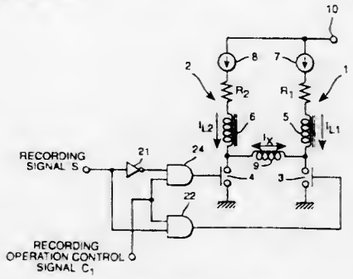
during disk drive reading operations, displacing the data transducer assembly from the centerline by the micro-jog distance, and reading with the read element the respective servo preamble, the respective single servo identification field, and the pair of servo bursts to obtain relative burst amplitudes therefrom in order to supply read-mode position error signals to the closed loop servo circuit to align the read element with the centerline.

5,587,851

MAGNETIC HEAD DRIVING DEVICE WITH PRERECORDING ENERGIZATION

Mitsuo Ishii, Nabari, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 275,239, Jul. 15, 1994, abandoned.
This application Dec. 11, 1995, Ser. No. 570,207
Claims priority, application Japan, Dec. 24, 1991, 3-341428
Int. Cl.[6] G11B *5/09;15/12;11/00*
U.S. Cl. 360—59 **6 Claims**



1. A magnetic head driving device, comprising:

an inductor for generating a magnetic field, said inductor having a pair of terminals;

first storing means for storing electromagnetic energy, said first storing means being connected to one of said terminals of said inductor at a first node;

second storing means for storing electromagnetic energy, said second storing means being connected to the other terminal of said inductor at a second node;

first switching means connected to said first node;

second switching means connected to said second node; and

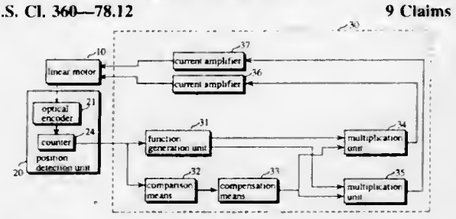
control means for receiving a first signal indicating that it causes the generation of a magnetic field by said inductor, and a second signal reversing the direction of current through said inductor and inverting the magnetic field with each reversal, said control means outputting a third signal during a predetermined period of time to alternately turn on and off said first switching means and said second switching means, the predetermined period of time being before Start of a recording operation, and physical change on magnetic media being precluded during the predetermined period of time.

5,587,852

DISK HEAD DRIVING DEVICE USING LINEAR ACTIVATOR WITH MULTIPOLAR MAGNETS

Tsukasa Yoshiura, Katano, and Kiyoshi Masaki, Amagasaki, both of Japan, assignors to Matsuhita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 6, 1994, Ser. No. 350,337
Claims priority, application Japan, Dec. 7, 1993, 5-305672
Int. Cl.[6] G11B *5/596*
U.S. Cl. 360—78.12 **9 Claims**



1. A head diving device comprising:

a carriage having a head for recording or reproducing data onto a data recording medium, said carriage being capable of moving in a straight line;

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a linear motor including a plurality of coils, a pair of multipolar magnets, and a stator yoke, said plurality of coils being fixed on the carriage and shifted from each other in a moving direction of the carriage, polarities of said multipolar magnets being alternated along a passage for said plurality of coils, and said stator yoke being ferromagnetic and fixing said multipolar magnets, wherein said multipolar magnets are disposed symmetrically along both sides of the passage for said plurality of coils, one of the coils is positioned so that its phase is shifted from at least one of the other coils by 90 degrees and the resulting magnetic field wave is accordingly shifted, said multipolar magnets are composed of a plurality of unipolar magnetic elements, and a width W of the unipolar magnetic elements and a distance D between adjacent unipolar magnetic elements are in a relation of $0.4\ W \leqq D \leqq 0.6\ W$;

a position detection means for detecting a position of the carriage, and

a driving circuit for supplying driving current to said plurality of coils, said driving circuit including a function generation means and a current calculation means, said function generation means generating function signals for each coil, each of said function signals corresponding to a detected position of the carriage, based on a dispersion of magnetic flux to be generated by said multipolar magnets and said current calculation means calculating current to be supplied to said plurality of coils, based on the function signals, wherein said driving circuit includes an operational signal generation means for generating operational signals, based on a position detected by said position detection means, and said current calculation means calculates an amount of current to be supplied to said plurality of coils by multiplying the operational signal generated by said operational signal generation means and the function signal generated by the function generation means, and said operational signal generation means generates the operational signals based on a positional error between the position detected by the position detection means and a desired position.

5,587,853

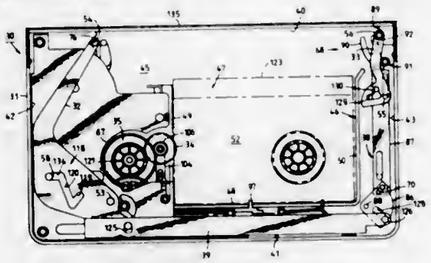
MANUALLY OPERATED VIDEO CASSETTE ADAPTER

David Tai, 1st. Fl., No. 17, Lane 180, Ho-Chiang Street, Taipei, Taiwan

Filed Aug. 8, 1995, Ser. No. 512,693

Int. Cl.[6] G11B *23/04*

U.S. Cl. 360—94 **11 Claims**



1. A video cassette adapter comprising:

a housing having a front section, a rear section, first and second lateral sections, a top wall, a bottom wall and a receptacle for receiving a VHS-C video cassette, the receptacle including a front portion, a rear portion, first and second lateral portions, a top opening and a bottom wall, the front portion of the receptacle being communicated with the front section of the housing;

a first tape conducting member having one end pivotally disposed between the first lateral section of the housing and the first lateral portion of the receptacle, and an other end provided with a tape conducting roller and shiftable from the front portion of the receptacle to the front section of the housing or from the front section of the housing to the front portion of the receptacle;

a second tape conducting member having one end pivotally disposed between the second lateral section of the housing and the second lateral portion of the receptacle, and an other end provided with a tape conducting roller and shiftable from the front portion of the receptacle to the front section of the housing or from the front section of the housing to the front portion of the receptacle;

a first gear rotatably disposed in the housing and extended through the first lateral portion of the receptacle to engage with a gear of a tape take-up reel of the video cassette;

a tape rolling reel rotatably disposed in the housing between the first lateral section thereof and the first lateral portion of the receptacle, the tape rolling reel being provided with a gear and drivingly engaged with the first gear;

an operation button slidably disposed on the top wall of the housing and extended through the top wall into the housing;

a driving lever slidably disposed in the housing and having a driving pin slidably operatively connected with the first tape conducting member to drive the same reversibly between a non-operation position to an operation position, the driving lever being connected with the operation button;

a transmission mechanism disposed between the second lateral section of the housing and the second lateral portion of the receptacle, one end of the transmission mechanism being slidably connected with the second tape conducting member;

a linkage lever slidable disposed between the rear section of the housing and the rear portion of the receptacle, two ends of the linkage lever being pivotally connected with the first tape conducting member and the transmission mechanism respectively; and

a spring connected between the housing and the driving lever.

5,587,854

CASE UNIT HAVING A DUAL CASE STRUCTURE FORMED BY AN OUTER CASE MEMBER AND AN INNER CASE MEMBER FOR A DISK STORAGE APPARATUS

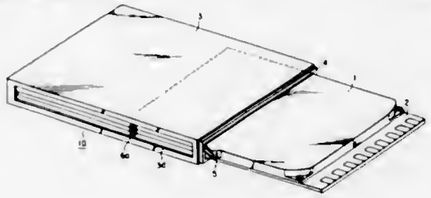
Toshikuni Sato, Kawasaki, and Masaya Agematsu, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

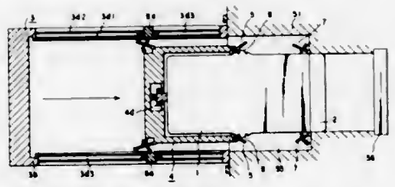
Filed May 15, 1994, Ser. No. 288,727

Claims priority, application Japan, Aug. 16, 1993, 5-202283

Int. Cl.[6] G11B *5/012;* **H05K** *7/12;7/14*

U.S. Cl. 360—97.01 **5 Claims**





1. A disk storage unit being removable from a computer body, the disk storage unit comprising:

connector means for connecting the computer body to a disk drive of the disk storage unit;

case means having an inner case member for containing the disk drive, an outer case member for containing the inner case member, and a guide mechanism for pushing out the inner case member from an inside of the outer case member to an outside of the outer case member, the inner case member having a case lock mechanism for removably holding the disk drive; and

a disk lock mechanism for removably holding the disk drive to the computer body when the disk drive is connected to the computer body by the connector means, the disk lock mechanism releasing the case lock mechanism and locking the disk drive when the inner case member is pushed out from the inside of the outer case member to the outside of the outer case member.

5,587,855

SUPPORTING DEVICE FOR MINIMIZING VIBRATION, NOISE AND EXTERNAL IMPACT OF A HARD DISK DRIVE

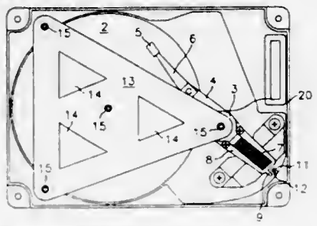
Kwang-Kyu Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 1, 1994, Ser. No. 352,803

Claims priority, application Rep. of Korea, Dec. 1, 1993, 26119/1993

Int. Cl.[6] G11B *33/08*

U.S. Cl. 360—97.02 **17 Claims**



1. A disk drive comprising:

a spindle motor;

a disk rotatably mounted upon said spindle motor;

a body providing a base accommodating rotation of said disk while said disk is driven by said spindle motor;

a pivot mounted upon said body;

a head assembly mounted rotatably mounted upon said pivot, said head assembly including an actuator and a magnetic head for writing and reading data recorded on said disk as said head assembly rotates about said pivot;

a cover enclosing said disk within said body;

a plate discrete and spaced apart from the cover, said plate being interposed between the cover and said head assembly, said plate having a thermal coefficient of expansion substantially the same as that of said body, said plate having a center portion attached to a shaft of said spindle motor and a plurality of peripheral portions separately extending from said center portion to said pivot of said head assembly and to a plurality of spaced-apart locations mutually separated from each other by said disk and from said pivot by said disk;

means for individually attaching each of said peripheral portions to said body; and

damper means disposed between said cover and said head assembly, said damper means being attached to one of an upper portion and a lower portion of said plate, for damping generation of said vibration, noise and external impact.

5,587,856

DISC LOADING MECHANISM INCLUDING A DAMPER MOUNTED IN A BASE PLATE RECESS

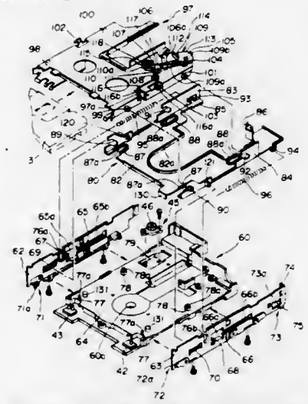
Takashi Aoyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 248,453, May 24, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,564

Claims priority, application Japan, May 28, 1993, 5-126419

Int. Cl.[6] G11B *17/04*

U.S. Cl. 360—99.02 **9 Claims**



1. A disk drive apparatus for reading data from and/or writing to a disk contained in a disk cartridge loaded thereon, comprising:

a chassis including first and second opposing side plates connected by a base plate such that said first and second side plates are supported perpendicular to said base plate in a spaced apart relationship, at least one of said first and second side plates being formed with an elongate horizontal closed slot including a hook at one end thereof;

disk cartridge positioning means integrally formed on an upper surface of said base plate for positioning said disk cartridge loaded thereon;

a slider movably supported on said chassis and receivable of said disk cartridge for moving said disk cartridge in upward and downward directions to facilitate engagement between a lower side of said disk cartridge and said disk cartridge positioning means according to a loading/unloading operation of said disk drive, wherein said disk cartridge positioning means guides movement of said slider in forward and rearward directions while permitting movement of said slider in upward and downward directions with respect to said base plate for an entire locus of movement of said slider in the forward and rearward directions, said slider including at least one projection at a side thereof engageable with said slot formed in said one side plate of said chassis

for guiding movement of said slider in a horizontal direction and for continuously preventing movement of said slider in the upward and downward directions with respect to said base plate; and

biasing means disposed in said slot and connected between said projection and said hook in said slot, said biasing means biasing said slider in a direction of extracting said disk cartridge.

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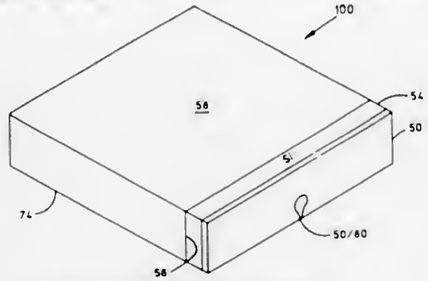
5,587,857

SILICON CHIP WITH AN INTEGRATED MAGNETORESISTIVE HEAD MOUNTED ON A SLIDER

Steven H. Voldman, Burlington, Vt.; Albert J. Wallash, Morgan Hill, Calif., and Reginald B. Wilcox, Jr., Cambridge, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1994, Ser. No. 324,841
Int. Cl.[6] G11B *21/21*
U.S. Cl. 360—103 **14 Claims**



1. A combined head and slider comprising:

a non-silicon slider body having a trailing edge;

a silicon chip having a leading edge and a trailing edge;

the leading edge of the silicon chip being fixedly mounted to the trailing edge of the slider;

at least one silicon circuit device mounted in the silicon chip;

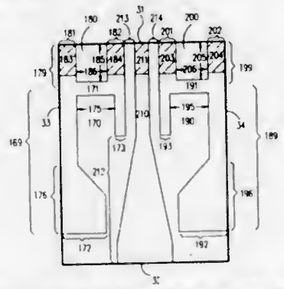
the head being mounted on a selected one of the trailing edge of the slider between the slider and the silicon chip or the trailing edge of the silicon chip and being connected to the silicon circuit device.

5,587,858

NEGATIVE PRESSURE SLIDER WITH OPTIMIZED LEADING POCKET FOR PROFILE CONTROL

Lee K. Dorius, and Laurence S. Samuelson, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 149,861, Nov. 10, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 486,088
Int. Cl.[6] G11B *5/60;21/21*
U.S. Cl. 360—103 **14 Claims**



1. A negative pressure air bearing slider for use in a disk drive, said slider including a leading edge, a trailing edge, first and second side edges, and an air bearing surface, said air bearing surface further comprising:

two TE pockets, each defined by a generally U-shaped rail including a cross rail and a pair of side rails extending from said cross rail in the direction of said trailing edge;

a center rail disposed between and spaced apart from said TE pockets extending from said leading edge to said trailing edge; and

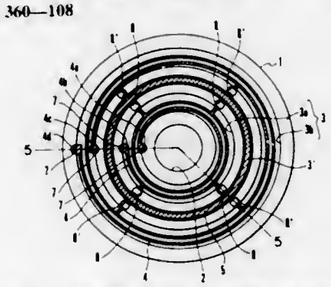
two LE pockets, each defined by a generally U-shaped rail including a cross-rail and a pair of side rails extending from said cross rail in the direction of said leading edge, wherein said U-shaped rail of each LE pocket abuts one of said U-shaped rails of said first and second TE pockets.

5,587,859

RECORDING AND/OR REPRODUCING APPARATUS HAVING ROTARY TRANSFORMER

Osamu Nagatsuka, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1994, Ser. No. 289,090
Claims priority, application Japan, Aug. 31, 1993, 5-239176
Int. Cl.[6] G11B *5/52*
U.S. Cl. 360—108 **16 Claims**



1. A rotary transformer arranged to transmit signals between a rotor and a stator, comprising:

(a) a pair of cores arranged to form said rotor and said stator, each of said pair of cores being in a cylindrical shape; and

(b) a plurality of windings secured to one end face of each of said pair of cores, each of said windings being in a flat plate shape, the center of each of said windings approximately coinciding with the center of each of said pair of cores, said windings differing in coil diameter, and said windings being provided respectively with protruding parts which are aligned in a radial direction of said cores, said protruding parts respective free ends radially spaced from one another within an outer perimeter of said plurality of windings.

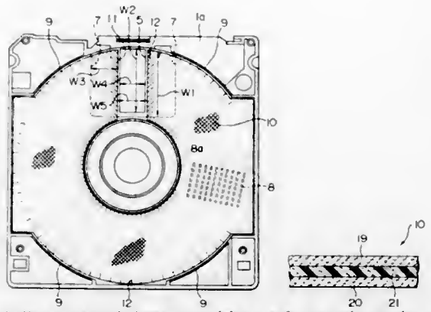
5,587,860

MAGNETIC DISC CARTRIDGE INCLUDING A MAGNETIC DISC HAVING A CLEANING SHEET COMPOSED OF A NON-THEROPLASTIC FIBER

Nobuhiro Umebayashi; Kunio Mizushima, both of Tsukuba; Akira Miyake, Osaka, and Teruhisa Miyata, Otokuni-gun, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 68,290, May 28, 1993, which is a continuation of Ser. No. 784,071, Oct. 30, 1991, which is a continuation of Ser. No. 378,826, Jul. 12, 1989. This application Dec. 23, 1994, Ser. No. 363,022
Claims priority, application Japan, Jul. 14, 1988, 63-173724; Sep. 1, 1988, 63-219240; Sep. 26, 1988, 63-240511
Int. Cl.[6] G11B *23/03;* **B32B** *5/16*
U.S. Cl. 360—133 **12 Claims**

1. A magnetic disc cartridge for high density recording of 35 Kfci or more comprising in combination a cartridge case, a magnetic disc housed rotatably in said cartridge case, and a cleaning sheet of non-woven fabric secured on an inner surface of said cartridge case juxtapositioned relative to said magnetic disc, said magnetic disc having a linear recording density of 35 Kfci or more



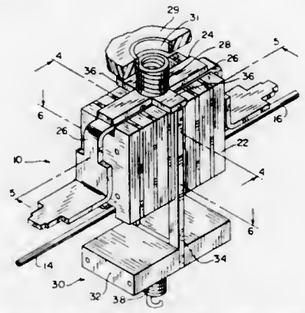
including a magnetic layer comprising a soft magnetic powder and a reinforcing powder dispersed in a binder resin, said soft magnetic powder being selected from at least one member of the group consisting of a ferromagnetic metal powder and a barium ferrite powder, said reinforcing powder having a particle size of from 0.1 to 1.0 μm and being present in said magnetic layer of said magnetic disc in an amount of from 5 to 40% by weight, wherein at least a disc side surface layer of said cleaning sheet, which is brought into direct sliding contact with said magnetic layer consists of a non-thermoplastic fiber.

5,587,861

METHOD FOR INTERRUPTING ELECTRICAL POWER BETWEEN TWO CONDUCTORS

Christopher J. Wieloch; Mark A. Kappel, both of Brookfield; Jeffrey R. Annis, Waukesha, all of Wis.; David J. Benard, Newbury Park, Calif.; Ellen Boehmer, Thousand Oaks, Calif., and Gernot Hildebrandt, Simi Valley, Calif., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 29, 1995, Ser. No. 536,712
Int. Cl.[6] H01H *73/00*
U.S. Cl. 361—14 **26 Claims**



1. A method for interrupting electrical power between first and second conductors comprising the steps of:

(a) biasing an electrically conductive spanner into a conducting position wherein electrical power is conducted between the first and second conductors;

(b) repelling the spanner in response to an excessive current condition to move the spanner to an interrupted position wherein electrical power between the first and second conductors is interrupted; and

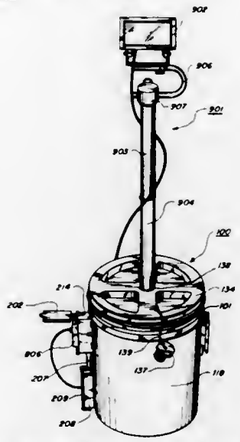
(c) directing expansion of arcs produced in step (b) between the spanner and the first conductor and between the spanner and the second conductor to generate a voltage tending to extinguish the arcs.

5,587,862

GROUND FAULT INTERRUPTER BUCKET COMBINATION

William D. Frank, Sr., P.O. Box 81, Long Plains Rd., West Buxton, Me. 04093

Filed Jul. 13, 1995, Ser. No. 501,943
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—42 **30 Claims**



27. A weathertight intermediate protective unit in combination with a user-installed sectional pole light, said combination comprising:

a portable, side-walled, essentially empty pail capable of carrying tools, power cords and other loose articles as required at job sites, with the pail being hand portable and having weathertight coverings over a top opening, an electrical receptacle located on the side wall of the pail and a power supply opening through a wall of said pail;

a weathertight protective ground fault interrupter ("GFI") unit electrically connected with said electrical receptacle to form an integral GFI/receptacle unit;

a grounded electrical wire located within the pail, said grounded wire having a fixed end electrically hard wired to said GFI/receptacle unit and a free end of said cord affixed with a plug for connection through said weathertight power supply opening to an external power source;

a sectional light pole with section lengths storable within said pail in a disassembled condition; and

a weathertight opening in the center of a pail lid covering said top opening in said pail, which central opening allows a sectional light pole to be secured to the interior bottom base of said pail through said top covering when said sectional pole is assembled.

5,587,863

DIGITAL INTERFACE UNIT

Jan O. Bergström; Lars Liljegren; Ove Skarhed, and Anders Årenäs, all of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

PCT No. PCT/SE92/00178, § 371 Date Jan. 26, 1994, § 102(e) Date Jan. 26, 1994, PCT Pub. No. WO92/17829, PCT Pub. Date Oct. 15, 1992
Continuation of Ser. No. 122,472, Jan. 26, 1994. This PCT application Mar. 23, 1992, Ser. No. 608,950
Claims priority, application Sweden, Apr. 2, 1991, 9100951
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—93 **13 Claims**

1. An integral digital signal interface for interfacing between an electronic control unit (ECU) and external electrical process equipment (EEPE), said interface having input terminals for receiving

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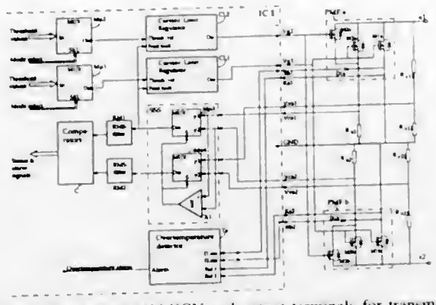


control signals from said ECU and output terminals for transmitting signals for controlling said EEPE, said digital signal interface comprising:

control means for receiving mode select signals from said ECU for selectively programming the interface to operate in digital output/input modes and for receiving threshold input values from said ECU to perform a plurality of functions for controlling the interface and for providing operating functions with respect to controlling said EEPE;

said control means including: at least one multiplexor for receiving at least one of said mode select signals and at least one of said threshold input values from said ECU; a first current limit regulator responsive to an output of said at least one multiplexor, power MOSFET circuits (PMCs) responsive to an output of said first current limit regulator for selectively switching said interface into respective digital input (DI) and digital output (DO) modes, and the interface is correspondingly set to receive input data/control signals from the ECU or to function to generate respective output signals for controlling the EEPE.

5,587,864

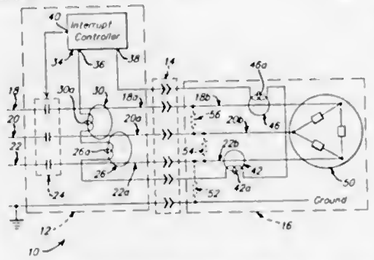
SHORT CIRCUIT AND GROUND FAULT PROTECTION FOR AN ELECTRICAL SYSTEM

Allan R. Gale, Allen Park, and Craig B. Toepfer, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 11, 1994, Ser. No. 225,872

Int. Cl.[6] H02H *3/32*

U.S. Cl. 361—44 **12 Claims**



1. A three-phase electrical system comprising a portion which further comprises:

a first phase conductor;

a second phase conductor;

a third phase conductor;

first current sensing means for sensing a current only in said first phase conductor; and

second current sensing means for sensing a current only in said third phase conductor; wherein

said first current sensing means comprises a first current transformer disposed about said first phase conductor; and

said second current sensing means comprises a second current transformer disposed about said third phase conductor; and

said first and second current transformers have a different product of transformer constant and square of number of coil turns.

5,587,865

ELECTRONIC CONTROL EQUIPMENT FOR MOTOR VEHICLES, PARTICULARLY, ELECTRONIC BRAKE CONTROL EQUIPMENT

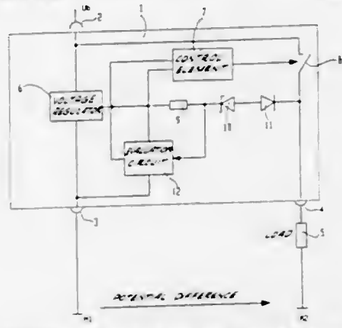
Peter M. Bielig; Klaus Brähler, both of München, and Günther Gschoßmann, Mühldorf, all of Germany, assignors to Knorr-Bremse Systeme Fur Nutzfahrzeuge GmbH, Munich, Germany

Filed May 1, 1995, Ser. No. 432,088

Claims priority, application Germany, May 2, 1994, 44 15 386.4

Int. Cl.[6] H02H *3/16*

U.S. Cl. 361—45 **12 Claims**



1. An electronic control apparatus that controls an electrical load for use in motor vehicles comprising:

at least one supply voltage terminal for providing a supply voltage to the control apparatus;

at least one ground terminal for grounding the control apparatus at a ground potential M1;

at least one output terminal for driving the load with the supply voltage, said load having a first connection to the output terminal and a second connection grounded to a ground potential M2;

a test circuit for causing a test current having a predetermined minimum magnitude to flow through the load only when the ground potential M1 exceeds the ground potential M2 by a threshold level;

a measuring element for detecting the magnitude of the test current; and

an evaluation circuit responsive to the magnitude of the test current detected by the measuring element for initiating countermeasures to protect said control apparatus from damage resulting from differences in the ground potentials M1 and M2.

5,587,866

POWER-ON RESET CIRCUIT

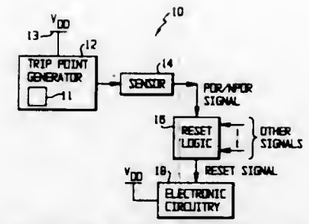
Randy L. Yach, Phoenix, and Richard L. Hull, Chandler, both of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Filed Jul. 27, 1995, Ser. No. 508,332

Int. Cl.[6] H02H *3/20*

U.S. Cl. 361—90 **6 Claims**

1. A power-on reset circuit coupled to an electronic circuit for placing the electronic circuit in reset when power is turned on and until the supply voltage for the electronic circuit reaches a predetermined threshold level and for taking the electronic circuit out of reset when the supply voltage exceeds said threshold level, the power-on reset circuit comprising:



a trip point generator coupled to receive the supply voltage and incorporating a worst case component constituting a component of the electronic circuit that requires the highest supply voltage to operate properly such that when said worst case component becomes operative, all components of the electronic are also in proper operation; and

sensor means coupled to said trip point generator and responsive to said worst case component becoming operative for generating a corresponding signal to take the electronic circuit out of reset, said sensor means including noise filter means for returning the electronic circuit to reset when supply voltage variations cause the supply voltage to drop below the threshold level for at least a predetermined time interval.

5,587,867

SURGE ABSORBER

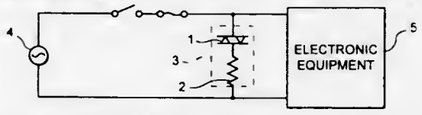
Koichi Kurasawa; Mikio Harada, and Takaaki Ito, all of Saitama-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,040

Claims priority, application Japan, Jun. 30, 1993, 5-162063

Int. Cl.[6] H02H *1/00*

U.S. Cl. 361—118 **8 Claims**



1. A surge absorber which comprises:

a surge absorbing element comprising a silicon two-terminal thyristor element having a PNPNP or NPNPN junction structure; and

a bulk resistance element which comprises a material having a resistivity within a range of from $10^{-4}\Omega\cdot$cm to $10^{3}\Omega\cdot$cm, and a resistance value within a range of from 0.5Ω to 50Ω;

said thyristor element and said bulk resistance element being connected in series to form an integral body.

5,587,868

HIGH VOLTAGE SPHERE-GAP DISCHARGE SWITCH, HIGH VOLTAGE PULSE GENERATION CIRCUIT AND HIGH VOLTAGE DISCHARGE SWITCHING METHOD

Kensuke Akutsu, Toyonaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Feb. 17, 1995, Ser. No. 390,607

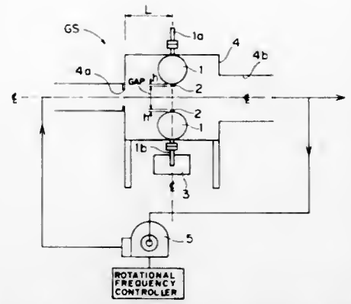
Claims priority, application Japan, Feb. 21, 1994, 6-022265

Int. Cl.[6] H01T *1/20*

U.S. Cl. 361—231 **8 Claims**

1. A high voltage sphere-gap discharge switch which operates by means of the generation of spark discharge comprising:

a support structure;



a pair of sphere electrodes mounted to said support structure which oppose each other and are separated by a discharge gap.

projections formed on mutually facing portions of said sphere electrodes and which have a projection length of $1/100$ to $1/8$ times the diameter of said sphere electrodes and an outer diameter of $1/100$ to $1/10$ times of said sphere electrodes, and

an air current generator associated with said support structure which selectively supplies an air current through said support structure for expelling products produced on the above mentioned projections, generated by the spark discharge;

wherein a pair of ventilation openings are provided on opposite sides of said support structure to allow an air current in a direction which intersects a line joining the centers of said pair of sphere electrodes, and said support structure includes an insulating case which houses said sphere electrodes.

5,587,869

HIGH-VOLTAGE CAPACITOR MANUFACTURING METHOD AND HIGH-VOLTAGE CAPACITOR

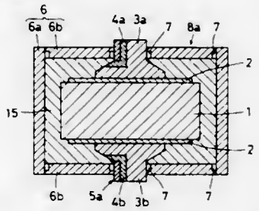
Takeshi Azumi; Osamu Yamaoka, and Kazuyuki Kubota, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

Filed Feb. 17, 1995, Ser. No. 390,482

Claims priority, application Japan, Feb. 17, 1994, 6-020538; Nov. 1, 1994, 6-293944

Int. Cl.[6] H01G *4/002;4/005;4/224*

U.S. Cl. 361—301.3 **16 Claims**



1. A high-voltage capacitor manufacturing method comprising the steps of: enclosing in a hermetic casing a capacitor body provided with an electrode connected to an external terminal, the external terminal including a passageway therein for making an inside of the hermetic casing communicate with an outside of the hermetic casing while the external terminal is led out of the hermetic casing from the electrode of the capacitor body; discharging a gas from the inside of the hermetic casing by way of the passageway within the external terminal to reduce the pressure inside the hermetic casing; and filling the inside of the hermetic casing with an insulating material.

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5,587,870

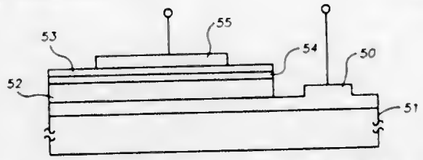
NANOCRYSTALLINE LAYER THIN FILM CAPACITORS

Wayne A. Anderson, Hamburg, N.Y.; Quanxi Jia, Los Alamos, N.M.; Junsin Yi, Amherst, and Lin-Huang Chang, Tonawanda, both of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 945,891, Sep. 17, 1992, Pat. No. 5,390,072. This application Jun. 22, 1994, Ser. No. 263,521

Int. Cl.[6] H01G *4/10*

U.S. Cl. 361—313 **43 Claims**



31. A high performance capacitor comprising film layers of a dielectric material arranged in opposing juxtaposition, one said layer comprising said dielectric in amorphous configuration, another of said layers comprising said dielectric material in nanocrystalline configuration and a further layer comprising said dielectric material in polycrystalline configuration, said opposing layers being arranged between upper and lower electrodes.

5,587,871

ELECTROLYTE SOLUTION FOR ELECTROLYTIC CAPACITOR AND ELECTROLYTIC CAPACITOR USING THE SAME

Makoto Ue; Tomohiro Sato, and Masayuki Takeda, all of Amimachi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo-to, Japan

Filed Mar. 30, 1994, Ser. No. 220,055

Claims priority, application Japan, Mar. 30, 1993, 5-071808

Int. Cl.[6] H01G *9/02*

U.S. Cl. 361—504 **30 Claims**

1. An electrolyte solution for an electrolytic capacitor containing an organic polar solvent and an ionic solute, characterized in that said electrolyte solution further comprises fine particles of an aluminosilicate represented by the following formula:

$$MAlO_2(Al_2O_3)_x(SiO_2)_y$$

wherein M represents a monovalent cation; x represents a real number of greater than 0 to 25; and y represents a real number of 1 to 200.

5,587,872

ELECTROCHEMICAL CELL HAVING SYMMETRIC INORGANIC ELECTRODES

Ke K. Lian, Northbrook; Changming Li, Vernon Hills; Richard H. Jung, Park Ridge, and Joseph G. Kincs, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1995, Ser. No. 547,821

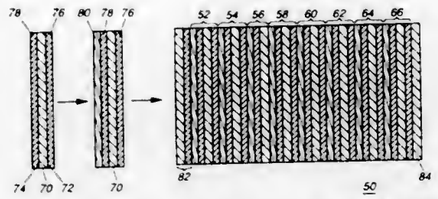
Int. Cl.[6] H01G *9/02*

U.S. Cl. 361—525 **8 Claims**

1. An electrochemical capacitor cell comprising:

an anode and a cathode comprising one or more materials selected from the group of Ru, Ir, Co, W, V, Fe, Mo, Ag, alloys thereof, oxides thereof and wherein the material for the anode and cathode is the same; and;

a polymer electrolyte in contact with and disposed between said anode, and said cathode, said polymer electrolyte comprising a polymeric support structure selected from polyvinyl alcohol,



polyethylene oxide, polyvinyl alcohol, polyvinyl acetate, polyacrylamide, poly(vinyl pyrolidone), poly(2-vinylpyridene) poly(4-vinyl pyridene) and polyethylene imine and having dispersed therein a proton conducting electrolyte active species selected from the group of H_3PO_4, and H_2SO_4.

5,587,873

DISTRIBUTOR

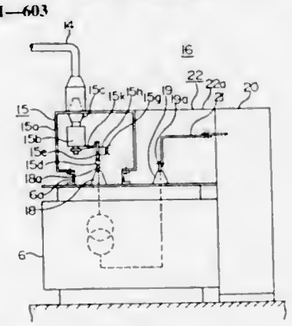
Michio Sakai; Ryouzou Hosoya; Nobuyuki Orito, and Minoru Nakahata, all of Marugame, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 39,319, Jun. 10, 1993, Pat. No. 5,340,012. This application Feb. 7, 1995, Ser. No. 385,811

Claims priority, application Japan, Aug. 23, 1991, 3-211784

Int. Cl.[6] H02B *5/00*

U.S. Cl. 361—603 **10 Claims**



1. A distributor, comprising:

at least one transformer;

a supply bushing disposed on top of each transformer;

a load bushing disposed on top of each transformer;

closed housings disposed on top of each transformer so as to cover each supply bushing and each load bushing for shielding said supply bushing and said load bushing;

a switch connected to each supply bushing and disposed in each closed housing which covers each supply bushing; and

a distribution board disposed adjacent one side of each transformer.

5,587,874

ELECTRICAL BUSWAY METER SERVICE PANEL COMBINATION

Dale Hoppensteadt, 22 W. 492 Lakeside Dr., Glen Ellyn, Ill. 60137, and Joseph L. Mirocha, 14333 S. Glen Dr. West, Lockport, Ill. 60441

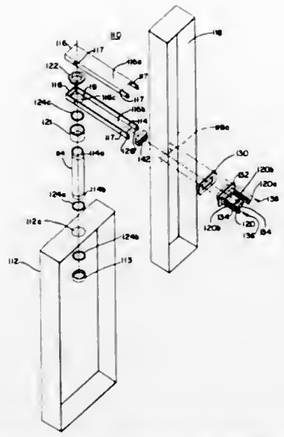
Filed Aug. 16, 1995, Ser. No. 515,649

Int. Cl.[6] H02B *1/00*

U.S. Cl. 361—663 **8 Claims**

1. An electrical busway meter service panel combination, comprising:

a meter fitting housing for housing a utility meter or at least one current transformer, said meter fitting housing having a housing aperture therein;



an insert busway for holding electrical conductors therein, said busway having a first end and a second end, said first end being positioned and slidable within said housing aperture;

said second end being integral to an outside portion of said insert busway which extend outside said meter fitting housing;

a conduit having a conduit first end and a conduit second end, said conduit first end being attached to said insert busway second end; and

a service disconnecting means housing, said service disconnecting means housing being connected to said conduit second end.

5,587,875

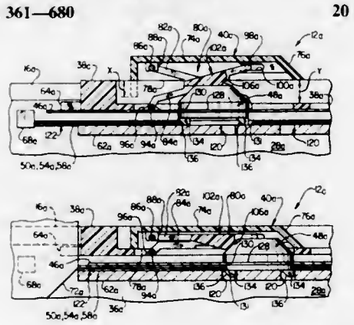
COLLAPSIBLE NOTEBOOK COMPUTER KEYBOARD STRUCTURE WITH HORIZONTALLY AND DOWNWARDLY SHIFTABLE KEY RETURN DOMES

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 268,818, Jun. 30, 1994, Pat. No. 5,532,904. This application Aug. 16, 1995, Ser. No. 515,987

Int. Cl.[6] G06F *1/16;* **H01H** *3/12;* **B41J** *11/56;* **H05K** *7/04*

U.S. Cl. 361—680 **20 Claims**



1. A collapsible keyboard structure for a portable computer, comprising:

a first support structure having top and bottom sides;

a series of keys each carried on said top side of said first support structure for vertical movement relative thereto, through a vertical key stroke distance, between extended and retracted positions separated by a vertical distance greater than said key stroke vertical distance;

a second support structure carried beneath said first support structure and having a top side facing said bottom side of said first support structure; and

a spaced series of resilient key return members anchored to said second support structure and having top end portions projecting upwardly beyond said top side of said second support structure,

said first and second support structures being horizontally and vertically shiftable relative to one another between a first position in which said key return members underlie and resiliently hold said keys in said extended positions thereof and permit said keys to be resiliently moved downwardly from said extended position through said key stroke distance, and a second position in which said key return members are horizontally and downwardly shifted in a manner permitting said keys to be moved from said extended positions thereof to said retracted positions thereof without vertically compressing said resilient key return members.

5,587,876

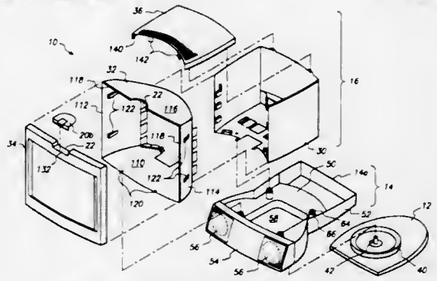
MODULAR MONITOR ARCHITECTURE

John O'Brien, and Jonathan Ive, both of San Francisco, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 30, 1995, Ser. No. 413,401

Int. Cl.[6] H05K *7/16*

U.S. Cl. 361—682 **18 Claims**



1. A modular architecture for a computer monitor comprising:

a base;

a tilt/swivel module;

a first attachment means for attaching the base to the tilt swivel module such that the tilt swivel module is rotatable and tillable with respect to the base;

a display module for housing a CRT; and

a second attachment means for attaching the display module to the tilt/swivel module such that the tilt/swivel module and the display module will rotate and tilt together when either is moved, the second attachment means including a plurality of cylindrical protrusions formed on a top of the tilt/swivel module, and a plurality of ring shape protrusions on the bottom of the display module, each sized and shaped to hole one of the plurality of cylindrical protrusions, and each positioned to correspond to a respective cylindrical protrusion.

5,587,877

COMPUTER ORGANIZER ENCLOSURE AND METHOD

Thomas P. Ryan, and Glen A. Stelzer, both of Schiller Park, Ill., assignors to Amco Engineering Co., Schiller Park, Ill.

Filed Oct. 26, 1994, Ser. No. 329,462

Int. Cl.[6] H05K *7/14*

U.S. Cl. 361—683 **19 Claims**

1. A computer organizer for auxiliary storage device enclosure comprising, in combination,

a U-shaped chassis having parallel sidewalls, a chassis base portion perpendicular to the sidewalls,

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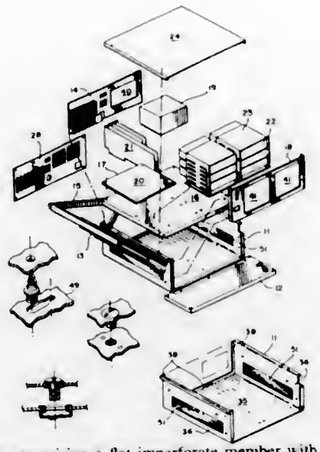


a spacer comprising a flat imperforate member with means for spacing the same from the chassis base in parallel relationship to the base and overlying substantially all of the chassis base thereby defining an encapsulating chamber therebetween,

an enclosure access frame spanning the forward portion of the chassis and secured to the chassis and having an opening therein to communicate with said auxiliary storage devices,

housings for the auxiliary storage devices,

means for removably securing said housings to the enclosure access frame and to the spacer,

each such removable auxiliary storage device housing having parallel longitudinal support means for removably securing an auxiliary device therein with the insert portion of the device facing the opening in the access frame,

means for mounting a circuit assembly behind of the devices and to the spacer,

a patch panel,

an interface panel proportioned to span the space between the rear side walls of the chassis and secured thereto and to the bottom of the chassis in electronic communication with the patch panel,

said interface panel having apertures therein, at least one of which is proportioned to removably engage a power supply,

an access panel hingedly secured to the lower forward portion of the base of the chassis and proportioned to overlie the enclosure frame and hinge to said chassis,

and a cover for removable securement atop the rectangular area bounded by the sidewalls of the chassis, the forward enclosure frame, and the interface panel.

5,587,878

ANTI-THEFT MECHANISM IN A COMPUTER SYSTEM HAVING REMOVABLE MODULES

Philip Tsai, Taipei; Chun-Yen Hung, Chung-Ho, and Fen-Shiung Wu, Taipei, all of Taiwan, assignors to Acer Incorporated, Taipei, Taiwan

Filed Feb. 15, 1995, Ser. No. 388,691

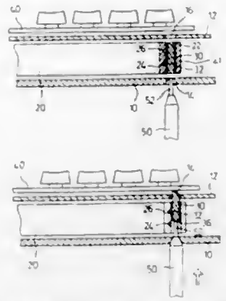
Int. Cl.[6] G06F *1/16*

U.S. Cl. 361—683 **9 Claims**

1. A module for sliding insertion along a first axis into a slot on a computer, the module comprising:

a portion formed with a through-hole extending along a second axis perpendicular to the first axis;

an elongate element movable along said second axis in said through-hole between a first position where said element is confined within said module and a second position where said element protrudes outside said module; and



a detent mechanism for maintaining said element in either of said first and second positions.

5,587,879

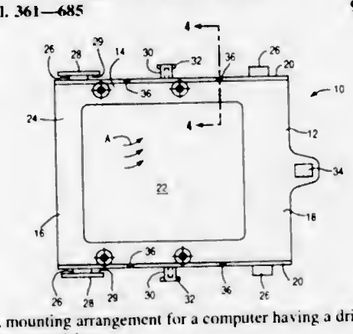
MOUNTING ARRANGEMENT FOR COMPUTER HARDWARE COMPONENTS AND METHOD

Joseph M. Spano, North Reading; Robert S. Antonuccio, Burlington, and James M. Carney, Pepperel, all of Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 187,991, Jan. 28, 1994, Pat. No. 5,481,431. This application Mar. 28, 1994, Ser. No. 218,500

Int. Cl.[6] H05K *5/00; 7/00*

U.S. Cl. 361—685 **9 Claims**



1. A mounting arrangement for a computer having a drive unit or the like, comprising:

a chassis having an area for receiving said drive unit,

said area including a support member for said drive unit,

said support member having an opening having a compressing surface,

said drive unit including a mounting and holding member,

said mounting member including a yieldable portion being constructed and arranged to be received in said opening and placed in contact with said compressing surface in a manner to compress said yieldable portion of said mounting member an amount to create a holding force sufficient to secure said drive unit to said support member,

said support member of said area comprising a platform and spaced walls projecting outwardly from said platform,

said opening formed in each of said walls,

a said mounting member for each opening,

each said mounting member comprising a grommet formed of a copolyester elastomer,

said support member comprises two said walls,

said walls connected to said platform in a manner to extend generally perpendicularly therefrom and having an opposed spaced apart relationship to each other sufficient to permit said drive unit to be received between said opposed walls for connection thereto,

each said walls having two longitudinally spaced apart said openings arranged to form opposed cooperative pairs of openings,

said drive unit having two opposed sides arranged generally parallel to said walls,

each said side of said drive unit having mounted thereon two spaced apart said grommets constructed and arranged so that associated portions thereof are received in a different one of said openings of said walls,

said walls and openings being constructed and arranged to permit said drive unit to be at least substantially received within the confines of said walls,

each said portion of an associated grommet arranged to project outwardly from said sides of said drive unit and adapted to be secured to said sides of said walls,

each said opening is formed with a first and second extending portion,

each said portion of said opening being arranged so that a said portion of an associated grommet is received first by said first portion of an associated said opening and then by said second portion thereof,

each said first portion having an area arranged to allow a said portion of an associated grommet to pass freely through said first portion,

each said second portion being arranged generally perpendicularly to an associated first portion and having a front part and a back part,

each said front part having a reduced open area forming an associated said compressing surface to compress a said portion of an associated grommet to create said holding force of a said portion of an associated grommet,

each said back part being enlarged relative to an associated front part for receiving a said portion of an associated grommet after passing through an associated front part, the enlargement being such that said compressed said portion of an associated grommet after passing through an associated front part will possess said holding force with said chassis,

each said grommet being cylindrical in shape in which an associated portion thereof is arranged adjacent to an associated side of said drive unit and a second portion thereof is spaced from an associated said side,

each said spaced portion of said grommets having a larger diameter than an associated adjacent portion thereof, and

each said grommet being constructed and arranged relative to an associated opening to place an associated adjacent portion in an associated opening.

5,587,880

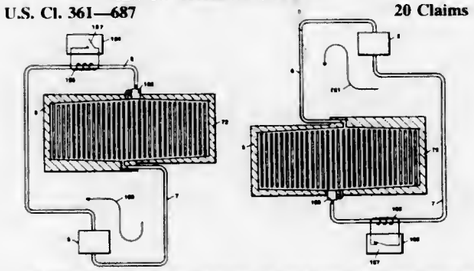
COMPUTER COOLING SYSTEM OPERABLE UNDER THE FORCE OF GRAVITY IN FIRST ORIENTATION AND AGAINST THE FORCE OF GRAVITY IN SECOND ORIENTATION

Richard J. Phillips, Alachua, Fla., and Ralph I. Larson, Bolton, Mass., assignors to Aavid Laboratories, Inc., South Lancaster, Mass.

Filed Jun. 28, 1995, Ser. No. 495,961

Int. Cl.[6] H05K *7/20;* **F28D** *15/02*

U.S. Cl. 361—687 **20 Claims**



18. Computer apparatus capable of operating in a first orientation and in a second orientation in an environment with an ambient pressure over a temperature range, the apparatus comprising:

a heat dissipating microprocessor;

a memory unit;

an evaporator unit having a first thermally conductive wall in contact with the microprocessor;

a condenser unit located vertically above the evaporator unit in the first orientation and vertically below the evaporator unit in the second orientation;

a first conduit connecting the evaporator unit and the condenser unit;

a second conduit connecting the condenser unit to the evaporator unit to form a hermetic enclosure with an interior and an internal pressure, the condenser unit having at least one wall which is sufficiently flexible that the internal pressure remains substantially at the ambient pressure over the entire temperature range;

a liquid coolant disposed within the hermetic enclosure interior, the liquid coolant having a sufficiently low boiling point that the liquid coolant is changed to a vapor by the heat dissipated from the microprocessor; and

a heater operative only in the second orientation for heating a portion of the first conduit sufficiently to cause bubbles of coolant vapor to form and rise in the first conduit.

5,587,881

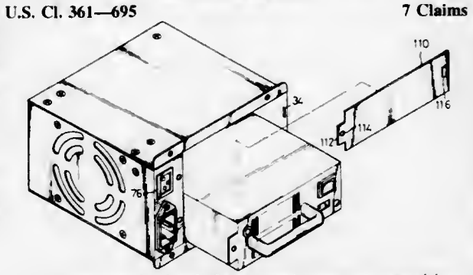
POWER SUPPLY CHASSIS FOR PERSONAL COMPUTERS

Joseph Wang, No. 18-3, Lane 197, Fuerh St., Keelung, Taiwan

Filed Dec. 27, 1995, Ser. No. 579,308

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—695 **7 Claims**



1. A power supply chassis for personal computers comprising:

a bottom plate;

a first wall plate defining a rail horizontally extending therealong at a mediate height thereof;

a second wall plate adjacent to the first wall plate;

a top plate supported by the first and the second wall plates; and

a wall frame coupled with the bottom plate, the second wall plate, and the top plate for defining a channel and having a plate defining a fan-frame vent, a guide facing the rail on the first wall plate as to divide the channel into a first compartment and a second compartment each slidably receiving a corresponding power supply cartridge, a fan fixedly secured within the frame in a direction of facing the fan-frame vent for expelling out of the chassis heat generated by the power supply cartridges out of the chassis, a first socket and a second socket on the second wall plate each respectively coupling with a corresponding power supply cartridge, and a power receptacle provided adjacent to an entrance of the channel for receiving a power cable.

5,587,882

THERMAL INTERFACE FOR A HEAT SINK AND A PLURALITY OF INTEGRATED CIRCUITS MOUNTED ON A SUBSTRATE

Chandrakant Patel, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

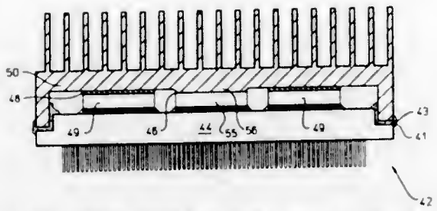
Filed Aug. 30, 1995, Ser. No. 521,480

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—705 **11 Claims**

1. A module assembly, comprising:

VOL 1193 ISS 4 DEC 24 1996 UMI



a planar substrate having a top surface, the top surface having a non-through peripheral trough;

at least one heat generating device mounted on the top surface of the substrate;

a heat sink having a support ring penetrating the trough;

a thermal transfer medium having a predetermined thickness, positioned between the at least one heat generating device and the heat sink, operative to conduct heat from the at least one heat generating device to the heat sink; and

a curable adhesive within the trough, securing the support ring to the substrate wherein the depth of penetration of the support ring into the trough positions the thermal transfer medium in contact with the heat sink and the at least one heat generating device.

5,587,883

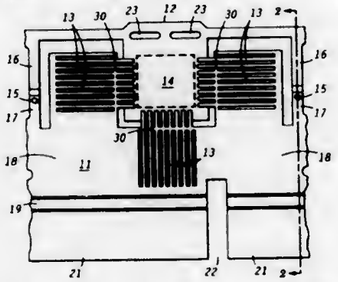
LEAD FRAME ASSEMBLY FOR SURFACE MOUNT INTEGRATED CIRCUIT POWER PACKAGE

Timothy L. Olson, Phoenix; Lauriann T. Carney, Gilbert; Gary C. Johnson, Tempe, and William M. Strom, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 376,636, Jan. 23, 1995, abandoned, which is a continuation of Ser. No. 215,000, Mar. 18, 1994, abandoned, which is a continuation of Ser. No. 985,055, Dec. 3, 1992, abandoned. This application Nov. 13, 1995, Ser. No. 557,667

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—723 **9 Claims**



7. A lead frame assembly for use in a semiconductor package comprising:

a lead frame comprising:

a first region in a first plane including a plurality of separated lead members;

a transition region contiguous with said first region;

a second region in a second plane contiguous with said transition region wherein said first and second planes are separated by a predetermined distance, said transition region creating said predetermined distance between said first and second regions of the lead frame, wherein a slot extends through said second region and said transition region into said first region;

a heat sink having a first surface and a second surface, said first surface providing an area for centrally mounting a semiconductor die wherein said heat sink includes a pair of arm like extensions each having a raised area and a stud formed thereon and wherein said lead frame includes a pair of arm extensions corresponding to said arm like extensions of said heat sink, said pair of arm extensions each having an opening formed therein receiving said studs, said studs being staked for holding said lead frame to said heat sink.

5,587,884

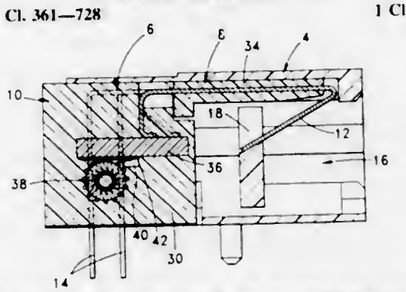
ELECTRICAL CONNECTOR JACK WITH ENCAPSULATED SIGNAL CONDITIONING COMPONENTS

Venkat A. Raman, Hershey, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 6, 1995, Ser. No. 384,086

Int. Cl.[6] H01R *13/66*

U.S. Cl. 361—728 **1 Claim**



1. A modular jack assembly for use in conditioning signals carried by wires comprising:

a housing including a cavity for receiving a modular plug;

an insert subassembly further comprising;

a plurality of contact terminals, the insert subassembly being insertable into the housing such that the contact terminals extend into the cavity and are positioned for engaging the modular plug,

a plurality of leads,

at least one signal conditioning component connected to corresponding leads and contact terminals, and

an insert molded body matable with the housing, the insert molded body positioning the leads for attachment to external circuits and the insert molded body encapsulating the signal conditioning components wherein the housing includes a open ended channel at the rear thereof in which the insert molded body is partially received, the insert molded body protruding from the channel at the rear of the housing.

5,587,885

MECHANICAL PRINTED CIRCUIT BOARD/LAMINATED MULTI CHIP MODULE INTERCONNECT APPARATUS

N. Deepak Swamy, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Continuation-in-part of Ser. No. 245,410, May 18, 1994, Pat. No. 5,400,220. This application Jul. 15, 1994, Ser. No. 275,854

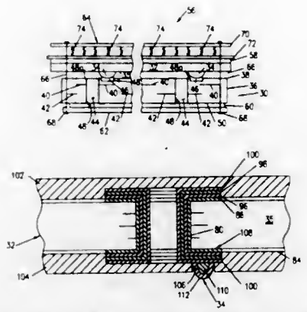
Int. Cl.[6] H05K *7/02*

U.S. Cl. 361—777 **8 Claims**

1. Circuit board apparatus comprising:

a circuit board substrate structure having first and second opposite sides, said circuit board substrate structure having a spaced series of first vias extending transversely therethrough between said first and second opposite sides, and further having a spaced series of socket areas offset from said spaced series of first vias and extending only partially through said circuit board substrate structure from said first side thereof;

a first metallic coating deposited on the interiors of said first vias and said socket areas and around their open ends on said first side of said circuit board substrate structure, portions of said first metallic coating being extended across said first side between associated first via/socket area pairs to electrically



couple them, said first metallic coating having, in said socket areas, a gold outer layer;

an electronic component having a substrate portion with first and second opposite sides, said electronic component substrate portion having a spaced series of second vias extending transversely therethrough between its opposite first and second sides, and a second metallic coating deposited on the interiors of said second vias and having exterior portions extending outwardly from open ends of said second vias along said first side of said electronic component substrate portion;

a spaced series of externally disposed, generally ball-shaped metallic lead portions formed on said exterior portions of said second metallic coating and having gold outer layers, said lead portions being partially received in and releasably engaging said second metallic coating on said socket areas; and

holding means for exerting a resilient force on said electronic component in a manner releasably holding said lead portions in engagement with said second metallic coating on their associated socket areas.

5,587,886

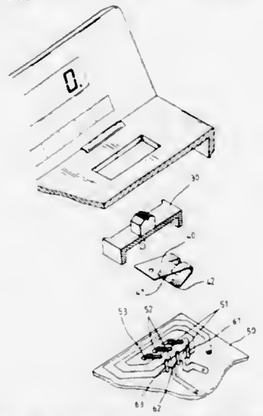
STRUCTURE FOR CONTACT POINTS OF A SHIFT SWITCH USED IN A COMPUTER

Si-Chi Lan, Taipei, Taiwan, assignor to Kinpo Electronics, Taipei, Taiwan

Filed May 4, 1995, Ser. No. 434,507

Int. Cl.[6] H01H *1/20;1/44;1/10;* **H05K** *7/02*

U.S. Cl. 361—781 **1 Claim**



1. A structure for contact points of a shift switch used in a computer comprising:

an elastic contact plate disposed under the shift switch and having a plurality of projecting contact points at a lower end thereof to contact the corresponding conductive contact portions of a circuit board, said contact portions are arranged on said circuit board in a series along a shifting direction of said shift switch, with a slot that is inclined along the direction of travel of said shift switch, said slots being formed between each pair of adjacent contact portions to separate said contact portions from each other.

5,587,887

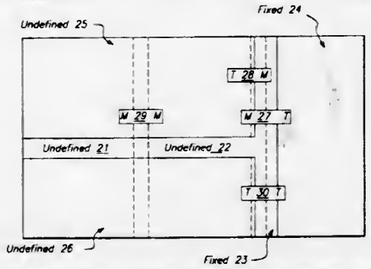
PRINTED CIRCUIT BOARD HAVING A CONFIGURABLE VOLTAGE SUPPLY

Noah M. Price, Campbell; Duane M. P. Takahashi, San Jose, and David C. Buuck, Santa Clara, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 432,227

Int. Cl.[6] H05K *1/11*

U.S. Cl. 361—794 **16 Claims**



1. A printed circuit board for connecting and holding devices in a plurality, of circuit designs, comprising:

at least one conductive layer of material comprising a plurality of electrically isolated voltage supply plane regions including a set of fixed voltage supply plane regions each being fixedly connectable to an associated power supply voltage and at least one undefined voltage supply plane region which is not directly connectable to a power supply voltage; and

a plurality of configurations of at least one insertable electrically conductive connector for coupling said set of fixed voltage supply plane regions to said undefined voltage supply plane region to accommodate said plurality of circuit designs.

5,587,888

EXTRACTING DEVICE FOR PLUG-IN MODULES

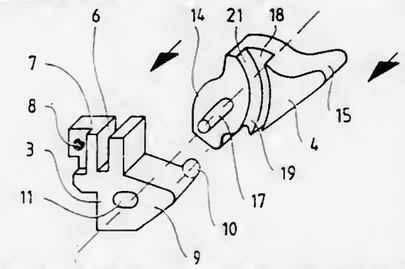
Michael Joist, Gaggenau, Germany, assignor to Schroff GmbH, Straubenhart, Germany

Filed Jan. 11, 1996, Ser. No. 584,358

Claims priority, application Germany, Jan. 23, 1995, 195 01 898.2

Int. Cl.[6] H05K *7/14*

U.S. Cl. 361—802 **3 Claims**



1. An extracting device for plug-in modules which are intended to be inserted into module racks, the device comprising a holding bracket for detachably securing a front plate as well as a printed circuit board on a profile rail of the module rack; a pivoted lever

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which is seated on the holding bracket by at least one swing pin, the latter being slidable in a slot of said holding bracket, said swing pin having a pressing shoulder on the pivoted lever, which shoulder is opposite of a front face of the profile rail when the plug-in module is inserted; said pivoted lever being displaceable with respect to the holding bracket by way of a sliding mechanism which comprises a sliding pin arranged on said holding bracket and a sliding track arranged on said pivoted lever, said sliding track having a concave curvature with respect to said swing pin.

5,587,889

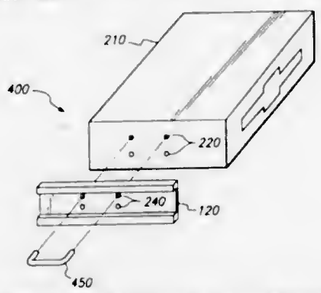
EDGE CONNECTOR FOR SECURING A MOUNTABLE ELECTRONIC COMPONENT TO A DEVICE WITH RECEIVING APERTURES FOR EDGE CONNECTOR

Jim Sacherman, 446 Ruthven, Palo Alto, Calif. 94301

Filed May 17, 1994, Ser. No. 243,967

Int. Cl.[6] H05K *7/14*

U.S. Cl. 361—809 **6 Claims**



1. An apparatus for rack mounting a peripheral electronic component to an electronic system, said apparatus comprising:

a. a primary rail means coupled to said electronic system;

b. an independent rail means designed to attach to said primary rail means; and

c. a screwless clamping means for coupling said independent rail to said peripheral electronic component comprising of:

an elongated arch having a convex surface and a concave surface, said arch further having an engaged state and a disengaged state, said arch being in the engaged state when the convex surface is depressed, said arch being in the disengaged state when the convex surface is not depressed; and

two legs for clamping an object placed therebetween, each of said legs being placed at an opposite end of the concave surface and angled inward of said arch, said two legs only clamping when said arch is in the disengaged state.

5,587,890

VEHICLE ELECTRIC POWER DISTRIBUTION SYSTEM

Lawrence R. Happ, Mundelein; Jacek Korczynski, Niles; William R. Bailey, Glen Ellyn, all of Ill., and Alan Lesesky, Charlotte, N.C., assignors to Cooper Industries, Inc., Houston, Tex.

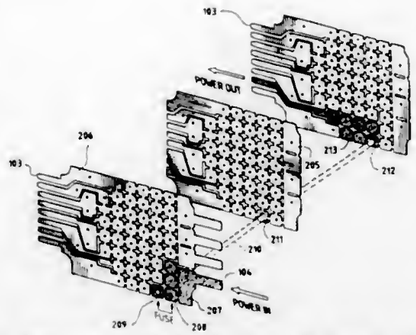
Filed Aug. 8, 1994, Ser. No. 287,623

Int. Cl.[6] H02B *1/20*

U.S. Cl. 361—826 **29 Claims**

1. A vehicle electric power distribution apparatus comprising:

a plurality of vertically stacked conductive circuit layers, each layer including a rectangular array of contact pads, each of the conductive circuit layers is at least partially coated with an electrically insulating plastic material, and at least some of the contact pads are electrically connected to selected other contact pads of the same conductive circuit layer via integrally formed conductive traces; and



a plurality of conductive pins providing electrical contact between selected contact pads of different selected conductive circuit layers.

5,587,891

ELECTRIC POWER CONVERTING APPARATUS

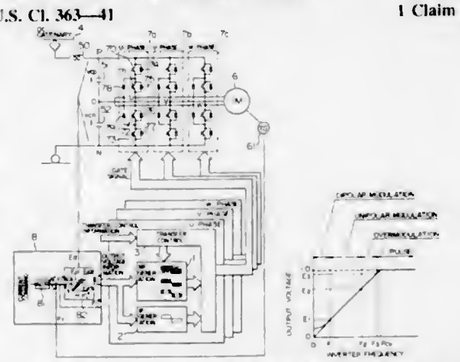
Kiyoshi Nakata, Nishiibaraki-Gun; Tokunosuke Tanamachi; Kiyoshi Nakamura, both of Katsuta; Mutsuhiro Terunuma, Mito; Masato Suzuki, Naka-Gun; Yoshio Tsutsui, Katsuta; Eiichi Toyota, Katsuta, and Koujl Yasuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 190,126, Feb. 3, 1994, Pat. No. 5,467,262. This application Jun. 7, 1995, Ser. No. 479,030

Claims priority, application Japan, Jun. 4, 1992, 4-143947

Int. Cl.[6] H02M *7/5387*

U.S. Cl. 363—41 **1 Claim**



1. An electric power converting apparatus for converting a DC voltage into AC phase voltages having 3-leveled potentials, for driving an AC motor, said electric power converting apparatus comprising:

first means for receiving the DC voltage and producing therefrom an AC voltage in a unipolar modulation mode, to produce a series of output pulses such that each half period of the fundamental wave of an output AC voltage of said electric power converting apparatus is represented by a series of single polarity pulses;

second means for receiving the DC voltage and producing therefrom an AC voltage in an overmodulation mode, to produce a series of output pulses such that each half period of the fundamental wave of the output AC voltage of said electric power converting apparatus is represented by a series of single polarity pulses filled up in the center by a plurality of pulses of the single polarity;

third means for receiving the DC voltage and producing therefrom an AC voltage in a 1-pulse mode, to produce an output pulse such that a half period of the fundamental wave of the output AC voltage of said electric power converting apparatus is represented by a single pulse having the same polarity as said half period; and

output means for switching among said first, second, and third, means to change the modulation mode among the unipolar modulation mode, the overmodulation mode, and the 1-pulse mode.

5,587,892

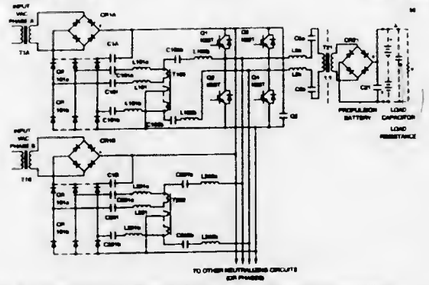
MULTI-PHASE POWER CONVERTER WITH HARMONIC NEUTRALIZATION

Alfred H. Barrett, Carmel, Ind., assignor to Delco Electronics Corp., Kokomo, Ind.

Filed Oct. 4, 1994, Ser. No. 317,457

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—44 **16 Claims**



1. A multi-phase AC to DC power converter comprising:

a plurality of inputs for respective phases of a multi-phase source of AC power,

a plurality of first rectifiers connected respectively to said inputs, each said first rectifier having an output,

load output terminals connected to said first rectifiers for delivering DC power to a load,

a multi-phase harmonic neutralizing converter comprising a power switching inverter having an input connected to the outputs of each of said first rectifiers, said inverter including LC resonant circuits and outputs associated with respective said first rectifiers,

said harmonic converter further comprising a plurality of second rectifiers having respective inputs connected to the respective outputs of said inverter through a plurality of respective transformers, each of said second rectifiers having an output connected in a voltage additive relationship to the output of the respective individual phase first rectifier, each respective added outputs of respective said first and second rectifiers connected to said load terminals.

5,587,893

VIDEO DISPLAY HIGH VOLTAGE GENERATOR

David Teng, Taipei, Taiwan, assignor to Chung-Chin Chen, Alexandria, Va.

Filed Jun. 16, 1995, Ser. No. 491,600

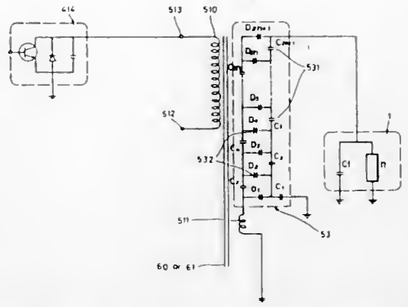
Int. Cl.[6] H02M *7/19;* **H01J** *29/70;* **H05G** *1/12*

U.S. Cl. 363—61 **14 Claims**

1. A high voltage generator for the anode of the cathode-ray tube of a video display, comprising:

a pair of cores;

a primary coil isolatedly wound on the center poles of the cores, having one terminal connected with the D.C. power supply of an electric circuit of the video display and the other terminal connected with a square wave generator of the video display via a horizontal switch of the electric circuit, said horizontal switch being periodically switched by a square-wave from the square wave generator;



a high voltage coil wound on the primary coil, having one terminal connected with ground and the other terminal connected with a multiplier;

a multiplier, comprising a plurality of metallized foil high voltage stepup capacitors and high voltage rectifiers, said foil high voltage stepup capacitors of the multiplier being wound on the high voltage coil, said multiplier having one terminal connected with the high voltage coil and the other terminal supplying the generated high voltage to the anode of the cathode-ray tube of the video display, the rectifiers therein being used to connect the foil stepup capacitors of the multiplier for stepping up the high voltage coil output to a required high voltage;

cores run through the center hole of the primary coil, and containing the components therein to form a magnetic path.

5,587,894

POWER SOURCE DEVICE

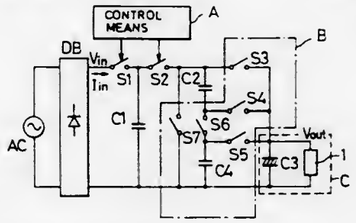
Masahiro Naruo, Shijonawate, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 28, 1995, Ser. No. 412,540

Claims priority, application Japan, Mar. 28, 1994, 6-057868

Int. Cl.[6] H02M *5/42;7/04*

U.S. Cl. 363—84 **19 Claims**



1. A power source device comprising:

a power source,

a first energy storing means connected through a first switching element in parallel to said power source,

a load circuit including a parallel connection of a voltage stabilizing means and a load and connected through a second switching element to said first energy storing means,

means connected to said first and second switching elements for controlling their ON/OFF operation, and

a voltage control means including a second energy storing means and a plurality of further switching elements and controlling an output voltage to said load circuit with switching operation of said further switching elements.

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5,587,895

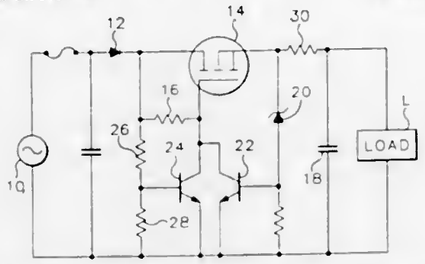
ELECTRICAL POWER SUPPLY WITH SINGLE OUTPUT FROM RANGE OF INPUT VOLTAGES

Michael T. Harkins, 7105 NE. Roselawn, Portland, Oreg. 97218

Filed Sep. 7, 1994, Ser. No. 301,941

Int. Cl.[6] H02M *7/06*

U.S. Cl. 363—89 **6 Claims**



1. An electric power supply, comprising:

a) half wave rectifier means having an input arranged for connection to a source of alternating current potential having a magnitude within a wide range of magnitudes, and an output providing positive half wave waveforms at the magnitude of the source potential,

b) a current storage capacitor arranged for connection across an electric load to be supplied with a predetermined electric potential and current,

c) high voltage switching means interconnecting the rectifier means and current storage capacitor,

d) low voltage regulating means interconnecting the current storage capacitor and high voltage switching means and operable to regulate the voltage to the current storage capacitor at said predetermined electric potential,

e) low voltage control means interconnecting the high voltage switching means and low voltage regulating means and operable upon activation of the low voltage regulating means to deactivate the high voltage switching means sufficiently to main the predetermined electric potential through the high voltage switching means to the electric load, and

f) resistive current regulating means interconnecting the high voltage switching means, low voltage regulating means and current storage capacitor and operable upon activation of the high voltage switching means to cause the low voltage regulating means to double as a current regulating means sufficiently to main the predetermined electric current to the electric load.

5,587,896

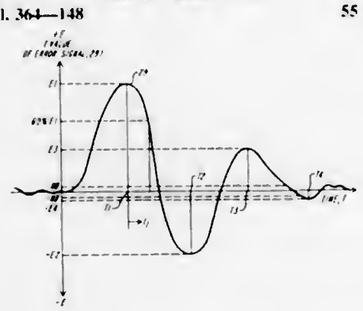
SELF-TUNING CONTROLLER

Peter D. Hansen, Wellesley Hills, and Edgar H. Bristol, Foxboro, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jul. 16, 1990, Ser. No. 553,915

Int. Cl.[6] G05B *13/02*

U.S. Cl. 364—148 **55 Claims**



1. A method claim for automatically adjusting the control parameters of a self-tuning controller used to regulate a process having a measured process variable signal, comprising the steps of:

generating an error signal representing a closed-loop response of the process to an upset condition;

measuring amplitude values of local extrema of said error signal;

selecting three successive amplitude values of said local extrema (E1, E2, and E3) such that the square of the second extremum (E2) is less than or equal to the first extremum (E1) times the third extremum (E3);

producing at least one measured performance characteristic by combining said successive local extrema; and

automatically adjusting at least one of the control parameters of the controller to improve the difference between said at least one measured performance characteristic and a target performance characteristic.

5,587,897

OPTIMIZATION DEVICE

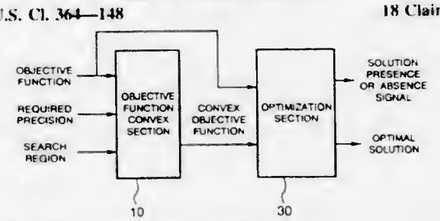
Kazuhiro Iida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,173

Claims priority, application Japan, Dec. 27, 1993, 5-330341

Int. Cl.[6] G05B *13/02, 13/04*

U.S. Cl. 364—148 **18 Claims**



4. An optimization device comprising:

means for inputting an objective function which includes a parameter to be optimized and is an object for searching an optimal solution, a required precision indicating a precision required in searching the optimal solution and a search region for searching the optimal solution for the objective function to make said objective function into a convex function;

means for inputting said convex objective function to detect a search start point for starting the search of the optimal solution from said search region of the optimal solution; and

means for detecting the optimal solution based on the detected search start point.

5,587,898

METHOD AND APPARATUS FOR FUZZY CONTROL

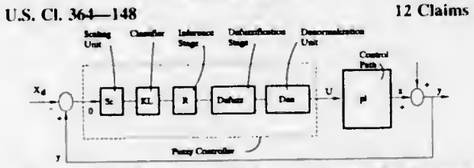
Rainer Palm, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 2, 1995, Ser. No. 397,857

Claims priority, application Germany, Mar. 17, 1994, 44 09 169.9

Int. Cl.[6] G05B *13/02*

U.S. Cl. 364—148 **12 Claims**



1. A method for fuzzy control of a device, comprising the steps of:

forming a control difference comprising at least one unsharp quantity having varying values with a probability density distribution of said values;

supplying said control difference to a fuzzy controller;

in said fuzzy controller, normalizing said probability density distribution to a predetermined value to obtain a normalized probability density distribution;

conducting a fuzzy logic inference procedure in said fuzzy controller using said normalized probability density distribution to determine a membership degree of said probability density distribution to form a manipulated quantity; and

controlling said device dependent on said manipulated quantity.

5,587,899

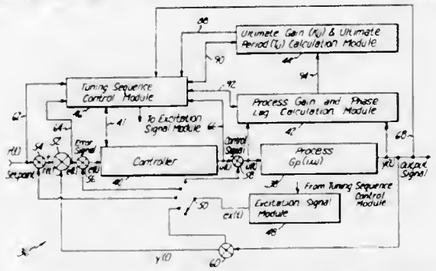
METHOD AND APPARATUS FOR DETERMINING THE ULTIMATE GAIN AND ULTIMATE PERIOD OF A CONTROLLED PROCESS

Weng K. Ho; Chang C. Hang, both of Singapore, Singapore, and Wilhelm K. Wojsznis, Round Rock, Tex., assignors to Fisher-Rosemount Systems, Inc., Austin, Tex.

Filed Jun. 10, 1994, Ser. No. 258,282

Int. Cl.[6] G05B *13/02*

U.S. Cl. 364—157 **59 Claims**



1. A method of determining an ultimate period and an ultimate gain of a controlled process, the controlled process having an input for receiving an input signal to control a parameter of the controlled process and an output for providing an output signal representative of the parameter of the controlled process, the method comprising:

selecting at least one observation frequency;

isolating from the input signal an input sample signal corresponding to each observation frequency;

isolating from the output signal an output sample signal corresponding to each observation frequency, wherein input and output sample signals correspond to a common observation frequency to form a corresponding pair of sample signals;

determining for each corresponding pair a phase lag of the output sample signal of the corresponding pair with respect to the input sample signal of the corresponding pair;

determining for each corresponding pair a signal gain of the output sample signal of the corresponding pair with respect to the input sample signal of the corresponding pair;

determining the ultimate period based on at least one observation frequency and at least one phase lag;

determining the ultimate gain based on at least one signal gain; and

modifying the input signal to the controlled process based on the ultimate period and ultimate gain and thereby modifying the control of the parameter of the controlled process.

5,587,900

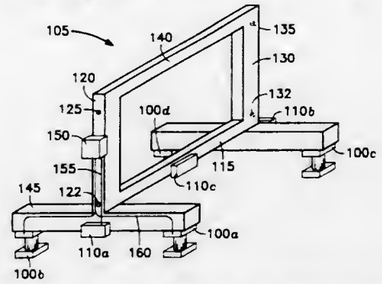
SELF LEVELING INDEPENDENTLY PROGRAMMABLE SYSTEM

George N. Bullen, Oxnard, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed May 23, 1995, Ser. No. 447,707

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—167.01 **11 Claims**



1. A system for sensing and changing an inclination of generally horizontal members of a jig frame assembly that includes a manufacturing plane, comprising

a lifting means affixed generally under an end of one of said members;

a level sensing means affixed to said member for sensing an inclination of said member; and

a computer comprising means to input a desired orientation of said manufacturing plane with respect to the horizon, means to compare said sensed inclination of said horizontal member with said desired orientation, means to compute a change in said sensed inclination to achieve said desired orientation, and means to transmit a control signal proportional to said change to said lifting means for the purpose of achieving said desired orientation of said manufacturing plane.

5,587,901

OPTICAL RECORDING MEDIUM HAVING A PRE-FORMED RECORDING TRACK WHICH IS OFFSET ALONG ITS WIDTH TO RECORD FRAME SYNC SIGNALS OF INFORMATION

Tamotsu Yamagami, Kanagawa-ken; Yoichiro Sako, Chiba, and Masanobu Yamamoto, Kanagawa-ken, all of Japan, assignors to Sony Corporation, Tokyo, Japan

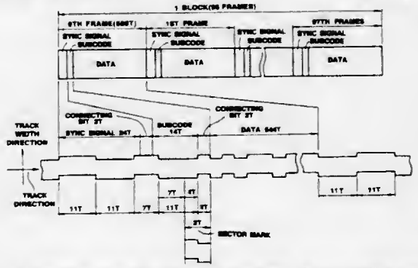
PCT No. PCT/JP90/01072, § 371 Date Apr. 22, 1991, § 102(e) Date Apr. 22, 1991, PCT Pub. No. WO91/03046, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 22, 1990, Ser. No. 689,057

Claims priority, application Japan, Aug. 25, 1989, 1-219413; Aug. 31, 1989, 1-225314; Aug. 31, 1989, 1-225315

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—275.3 **12 Claims**



1. A magneto-optical recording medium for recording main information data which are organized into a sequence of a predetermined number of frames, each frame, prior to recording, having

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a frame sync signal located at a particular point in the frame, the optical recording medium comprising:

a recording track extending in a track direction;

a recordable region for magneto-optically recording the main information on the recording track along the track direction; and

wherein for each recorded frame of main information, frame sync signals having the same signal format as that of the frame sync signals for the main information data are previously recorded by offsetting the recording track in a direction perpendicular to the track direction.

5,587,902

TRANSLATING SYSTEM FOR PROCESSING TEXT WITH MARKUP SIGNS

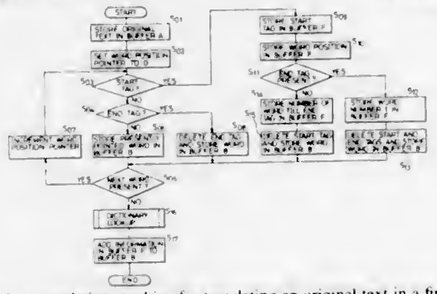
Shuzo Kugimiya, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka-fu, Japan

Filed May 26, 1993, Ser. No. 67,143

Claims priority, application Japan, May 26, 1992, 4-133552; May 7, 1993, 5-106405

Int. Cl.[6] **G06F** *15/38*

U.S. Cl. 395—752 **10 Claims**



1. A translating machine for translating an original text in a first language including one or a plurality of predetermined markup signs into a translated text in a second language, comprising:

means for associating each of said one or a plurality of predetermined markup signs with words within the original text;

separation means for separating the original text into markup signs and a text body exclusive of the markup signs;

storage means for storing each markup sign with each word to which each said markup sign is associated;

means for producing a parsing tree in the second language from said text body; and

means for producing, in communication with said means for producing a parsing tree and said storage means, the translated text from said parsing tree and attaching a markup sign to each word within the translated text equivalent to each of said one or a plurality of markup signs associated with each word within the original text.

5,587,903

ARTIFICIAL INTELLIGENCE LANGUAGE PROGRAM

Thomas W. Yale, c/o Yale Laboratories, Inc. 9, White Oak Rd., Springfield, Ill. 62707

Filed Jun. 22, 1994, Ser. No. 264,071

Int. Cl.[6] **G06F** *17/27;17/00*

U.S. Cl. 395—759 **14 Claims**

1. A method for translating a sentence entered by a user into machine recognizable thought patterns, said method comprising:

receiving the sentence entered by the user;

translating the user's sentence to a universal language;

parsing the translated sentence;

deriving propositions from the parsed translated sentence of the user;

sequentially storing the derived propositions into a knowledge database; and,

generating a set of peripheral database linkages for the sets of derived propositions representing the user's sentence, wherein each peripheral database linkage includes a peripheral database representing a function of speech selectively linked to one or more of the other peripheral databases and the knowledge database.

5,587,904

AIR COMBAT MONITORING SYSTEM AND METHODS AND APPARATUS USEFUL THEREFOR

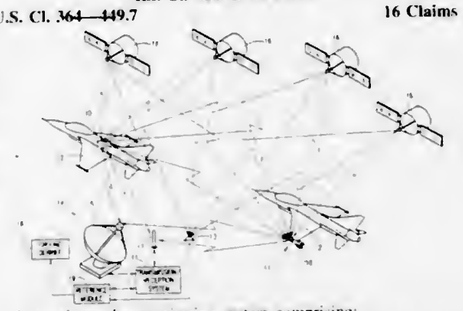
Igal Ben-Yair, Tel Aviv; Haim Berger, Ganei Tikva, and Oleg Perelmuter, Rishon Lezion, all of Israel, assignors to Israel Aircraft Industries, Ltd., Lod, Israel

Filed Jun. 10, 1994, Ser. No. 258,973

Claims priority, application Israel, Jun. 11, 1993, 105991

Int. Cl.[6] **G09B** *9/08;9/16*

U.S. Cl. 364—449.7 **16 Claims**



1. An air combat monitoring system comprising:

a plurality of GPS receivers, mountable on a corresponding plurality of aircraft;

an avionics monitor mountable on each of the corresponding plurality of aircraft for monitoring the avionics systems of the aircraft;

a memory for storing information received from the GPS receivers indicating the location of the plurality of aircraft and information received from the avionics monitor in order to provide a reviewable output indication of the performance of the plurality of aircraft;

an information disseminator for communicating said information among said plurality of aircraft including

means employing GPS signals for synchronization of aircraft mounted apparatus on the plurality of aircraft; and

means employing time division multiplexing for communicating said information among the plurality of aircraft.

5,587,905

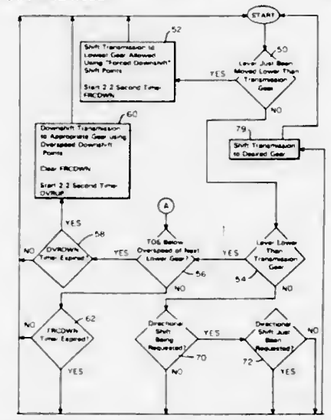
TRANSMISSION AND ENGINE OVERSPEED CONTROL

Leon P. Yesel, East Peoria, and John P. Kitzerow, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 15, 1994, Ser. No. 275,861

Int. Cl.[6] **B60K** *41/08*

U.S. Cl. 364—424.082 **15 Claims**



1. A method for controlling overspeed conditions of an electronically controlled transmission and engine, said transmission having an output shaft and being electronically shiftable by an electronic shift control module between forward and reverse gears to rotate said output shaft in forward and reverse directions and a neutral gear without shaft rotation, said transmission having an operator controlled shift lever for requesting a gear from said forward, neutral and reverse gears, said transmission operating in a present gear from among said forward, reverse and neutral gears; said method comprising the steps of:

determining forced downshift shift points and storing said forced downshift shift points in a memory portion of said electronic shift control module;

determining overspeed downshift shift points and storing said overspeed downshift shift points in a memory portion of said electronic shift control module;

determining overspeed upshift shift points and storing said overspeed upshift shift points in a memory portion of said electronic shift control module;

determining a directional shift inhibit speed and storing said directional shift inhibit speed in a memory portion of said electronic shift control module;

determining overspeed values for each gear based on engine speed and transmission output shaft speed and storing said overspeed value for each gear in a memory portion of said electronic shift control module;

monitoring engine speed;

monitoring speed of said output shaft;

determining whether said shift lever is operated to request a gear from said forward, reverse and neutral gears;

downshifting said transmission to lowest possible gear using said forced downshift shift points and sequentially changing gears until the requested gear is reached when said requested gear is a lower gear than said present gear and said requested gear is newly requested, and setting a forced downshift timer for a first preselected time duration and preventing said transmission shaft output speed from exceeding the overspeed value for more than said first preselected time duration;

temporarily upshifting said transmission, using said overspeed upshift shift points, when said transmission shaft output speed exceeds speed for present gear for more than a second preselected time set by an overspeed downshift timer then downshifting to said requested gear using said overspeed downshift shift points;

downshifting said transmission to lowest possible gear in requested direction of travel, using said forced downshift shift points, in response to a change of direction request when said transmission shaft output speed is above the overspeed value for said requested gear but not above the directional shift inhibit speed; and

downshifting transmission to lowest possible gear in present direction of travel, using said forced downshift shift points, in response to a change of direction request when said transmission shaft output speed exceeds direction shift inhibit speed.

5,587,906

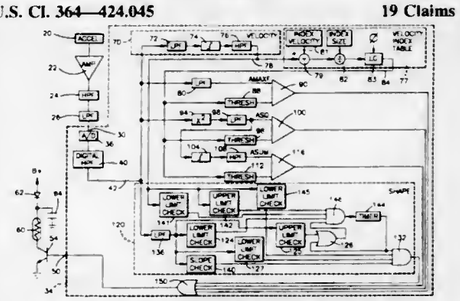
METHOD AND APPARATUS FOR SENSING A VEHICLE CRASH CONDITION USING VELOCITY ENHANCED ACCELERATION CRASH METRICS

George W. McIver, Redondo Beach; Mark A. Carlin, Hermosa Beach, both of Calif.; James E. Bormann, LaPorte, Ind.; Ronald A. Muckley, Milford, and Roger A. McCurdy, Troy, both of Mich., assignors to TRW Inc., Lyndburst, Ohio

Filed Jun. 13, 1994, Ser. No. 258,952

Int. Cl.[6] **B60R** *21/32*

U.S. Cl. 364—424.045 **19 Claims**



1. An apparatus for sensing a vehicle crash condition comprising:

acceleration sensing means for sensing a vehicle crash condition and for providing a crash acceleration signal having a characteristic indicative of the vehicle crash condition;

crash velocity determining means connected to said acceleration sensing means for determining a crash velocity value from said crash acceleration signal;

crash metric determining means connected to said acceleration sensing means for determining a crash metric value functionally related to said acceleration signal;

threshold determining means for determining a velocity based threshold value functionally related to said determined crash velocity value, said velocity based threshold value varying as a function of said determined crash velocity value;

comparing means for comparing said determined crash metric value against said velocity based threshold value and for providing a signal indicative of the comparison; and

control signal means for providing a control signal in response to said comparing means when said determined crash metric exceeds said velocity based threshold value.

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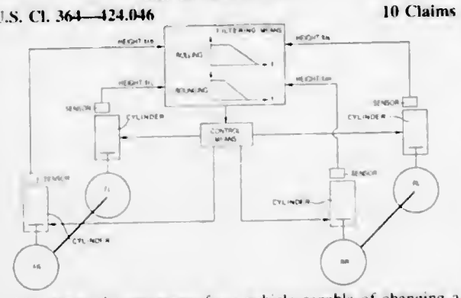
5,587,907

VEHICLE SUSPENSION APPARATUS CAPABLE OF PREVENTING GENERATION OF TRANSITIONAL VARIATION IN ROLLING MOVEMENT

Mineharu Shibata, Ohtake, and Shin Takehara, Higashihiroshima, both of Japan, assignors to Naldec Corporation, and Mazda Motor Corporation, both of Hiroshima, Japan

Continuation of Ser. No. 90,255, Jul. 13, 1993, abandoned.
This application Jun. 30, 1995, Ser. No. 497,702
Claims priority, application Japan, Jul. 14, 1992, 4-186605
Int. Cl.[6] B60G *17/015*
U.S. Cl. 364—424.046 **10 Claims**



1. A suspension apparatus for a vehicle capable of changing a characteristic of suspension by controlling a resistance force generated by hydraulic cylinders which are respectively provided between a vehicle body and each wheel of the vehicle, comprising:

a plurality of vehicle-height sensors detecting vehicle height signals at a plurality of positions;

extraction means for extracting a bouncing component signal and a rolling component signal from the vehicle-height signals detected by the plurality of vehicle-height sensors;

low pass filtering means for passing a low frequency component each of the bouncing component signal and the rolling component signal; and

control means for controlling a resistance force of each hydraulic cylinder against a relative displacement of the vehicle body with respect to the wheel based on output signals from said low-pass filtering means,

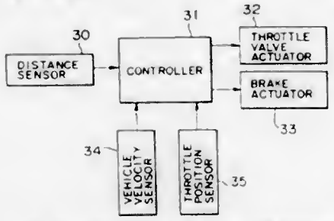
wherein a cut-off frequency for the low frequency component of the rolling component signal set in the low-pass filtering means is set higher than a cut-off frequency for the low frequency component the bouncing component signal.

5,587,908

DISTANCE MEASUREMENT DEVICE AND VEHICLE VELOCITY CONTROL DEVICE FOR MAINTAINING INTER-VEHICULAR DISTANCE

Yasuya Kajiwara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1993, Ser. No. 147,320
Claims priority, application Japan, Dec. 22, 1992, 4-342415
Int. Cl.[6] B60K *31/04*
U.S. Cl. 364—426.041 **19 Claims**



6. A vehicle velocity control device for maintaining an inter-vehicular distance, comprising:

distance measurement means mounted on a vehicle for measuring a distance to another vehicle and outputting measurement values at a predetermined sampling period;

a weighting means operable to adjust each of said measurement values by weighting each of said measurement values and a previously adjusted measurement value to obtain a currently adjusted distance value;

selecting means for selecting a weighting constant of said weighting means from a plurality of weighting constants depending upon a current measurement value output from said distance measurement means;

wherein said weighting means uses said selected weighting constant to adjust the currently measured value to thereby provide said currently adjusted distance value;

deviation detection means, coupled to said distance measurement means, for calculating a deviation of said currently adjusted distance value from a target inter-vehicle distance;

calculation means, coupled to said deviation detection means, for calculating a parameter corresponding to said deviation; and

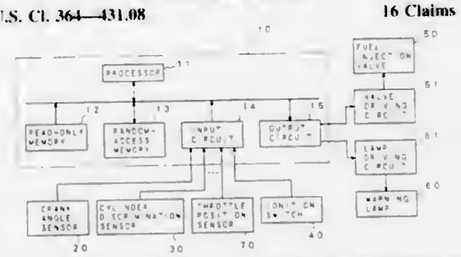
vehicle velocity control means, coupled to said calculation means, for controlling a vehicle velocity of said vehicle on the basis of said parameter, such that said distance to said another vehicle is maintained at said target inter-vehicle distance.

5,587,909

MISFIRE DETECTING METHOD

Takuya Matsumoto; Toru Hashimoto; Koichi Namiki; Yasuhisa Yoshida, and Satoshi Kasai, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP93/00764, § 371 Date Nov. 18, 1993, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO93/25809, PCT Pub. Date Dec. 23, 1993
PCT Filed Jun. 8, 1993, Ser. No. 150,063
Claims priority, application Japan, Jun. 16, 1992, 4-156976; Feb. 17, 1993, 5-028216
Int. Cl.[6] G01M *15/00*
U.S. Cl. 364—431.08 **16 Claims**



1. A misfire detecting method in which misfire detection is carried out based on a variation in rotating condition of an output shaft of an internal combustion engine, comprising:

(a) determining a variation of rotation of said output shaft by determining whether a rotation of said output shaft has varied toward a higher-speed side immediately after said rotation of said output shaft has varied toward a lower-speed side;

(b) provisionally determining that a misfire is occurring when said detected variation of rotation below said predetermined misfire discrimination value;

(c) initiating a timer to count a predetermined rough-road judgement after said misfire has been provisionally determined;

(d) determining that said vehicle is running on a rough road when said variation in rotation becomes greater than a predetermined rough-road discrimination value before said predetermined rough-road judgment time elapses; and

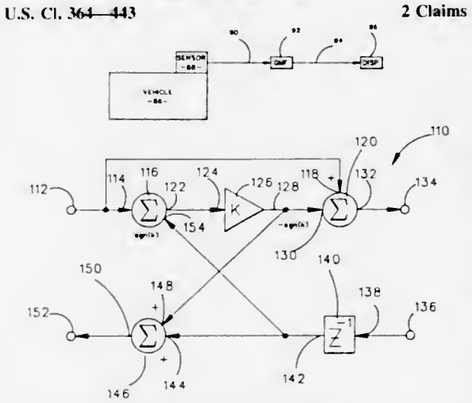
(e) invalidating said provisionally determined misfire when it is detected in said step (d) that said vehicle is running on said rough road.

5,587,910

VEHICLE NAVIGATION SYSTEM WITH NON-OVERFLOW DIGITAL FILTER

Jeffrey P. Woodard, Irvine, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 6, 1995, Ser. No. 384,084
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—443 **2 Claims**



1. A vehicle navigational system, comprising:

(a) a vehicle;

(b) a sensor mounted on the vehicle and producing a navigation signal;

(c) a one-multiplier Gray-Markel filter having an input connected to receive the navigational signal, and having at least one stage, each stage comprising:

(1) a first summer connected to receive, at a plus input, a first input to the stage;

(2) a multiplier connected to multiply an output of the first summer by a constant k;

(3) a second summer connected to receive:

(A) at a plus input, the first input to the stage; and

(B) at a variable input, an output of the multiplier, the variable input being:

(1) a minus input if k is greater than 0; and

(2) a plus input if k is less than 0;

wherein an output of the second summer is a first output of the stage;

(4) a delay element connected to:

(A) receive a second input to the stage; and

(B) apply an output to a complement input of the first summer, the complement input being the negative of the variable input; and

(5) a third summer connected to receive:

(A) at a first plus input, the output of the multiplier; and

(B) at a second plus input, the output of the delay element; and

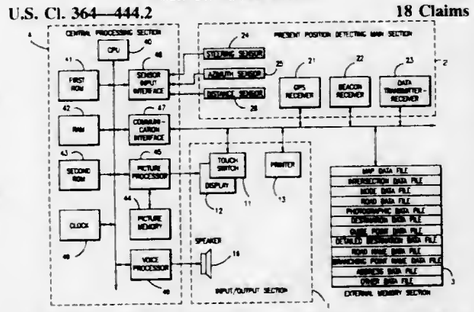
(d) a filtered navigation signal display driven by an output of the one-multiplier Gray-Markel filter.

5,587,911

NAVIGATION SYSTEM WITH SELECTIVE INTERSECTION DISPLAY

Hitoshi Asano, Nagoya; Wataru Ishikawa, and Mitsuhiro Nimura, both of Okazaki, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Continuation of Ser. No. 280,677, Jul. 27, 1994, abandoned.
This application Dec. 1, 1995, Ser. No. 566,451
Claims priority, application Japan, Jul. 27, 1993, 5-204576
Int. Cl.[6] G06F *165/00*
U.S. Cl. 364—444.2 **18 Claims**



1. A navigation system for guiding a vehicle to a destination in accordance with a searched route composed of a series of interconnecting roads and intersections, comprising:

external memory means for storing at least road data and intersection data including (1) text information including names of roads and identifying data for identifying intersections and (2) coordinate data for the intersections;

a video display for being viewed by a vehicle operator;

present position detecting means for detecting the present position of the vehicle;

input means for inputting the destination;

route searching means for determining a route from the detected present position to the input destination, by searching the data stored in said external memory means;

route storing means for retrieving, from said external memory means, text information for the route determined by said route searching means and for storing said retrieved text information as route text information;

control means for retrieving the route text information from said route storing means and for listing items of said route text information, including at least the road names and plural identified intersections, in geographical sequence;

first picture means for picturing a route information screen on said video display to display the listed items of said text information;

intersection selecting means for selecting any one of the plural, identified intersections listed on the route information screen; and

second picture means for retrieving the coordinate data for the selected intersection from said external memory means and for providing a map display screen on said video display to show a map including the position of selected intersection.

5,587,912

COMPUTER AIDED PROCESSING OF THREE-DIMENSIONAL OBJECT AND APPARATUS THEREFOR

Matts Andersson, Lerum, and Anders Törnquist, Gothenburg, both of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden

Filed Jul. 7, 1994, Ser. No. 271,457
Claims priority, application Sweden, Jul. 12, 1993, 93 02399
Int. Cl.[6] G05F *19/00*
U.S. Cl. 364—468.04 **15 Claims**

1. A method of generating data for manufacturing a three-dimensional body using a program with computer aided design, comprising:

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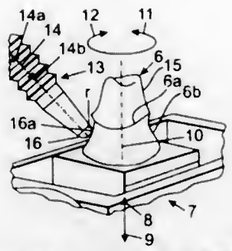


generating input data for a computer, said data representing a three-dimensional body model;

storing said input data in said computer;

responsive to activation of an input device, generating through said computer program first signals for forming, based on said input data, a plurality of surfaces representing said three-dimensional body model, wherein each surface comprises a contour of a vertical section extending through a central axis of said three-dimensional body model;

responsive to activation of said input device, generating through said computer program second signals for modifying contours of vertical sections in accordance with said desired three-dimensional body; and

responsive to activation of said input device, generating through said computer program third signals for storing output data which denotes modifications of said contours in response to said second signals, said output data being transmittable from said computer for manufacturing said three-dimensional body.

5,587,913

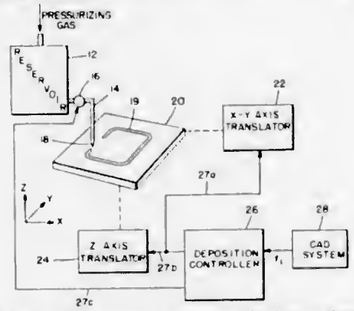
METHOD EMPLOYING SEQUENTIAL TWO-DIMENSIONAL GEOMETRY FOR PRODUCING SHELLS FOR FABRICATION BY A RAPID PROTOTYPING SYSTEM

Steven R. Abrams, New York; James U. Korein, Chappaqua; Vijay Srinivasan, Peekskill, and Konstantinos Tarabanis, Flushing, all of N.Y., assignors to Stratasys, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 4,038, Jan. 15, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 322,401

Int. Cl.[6] G06F *19/00;17/50;17/10*

U.S. Cl. 364—468.26 **10 Claims**



1. A method for operating a system to fabricate a three dimensional object from a computer-generated specification of a solid S, the computer-generated specification of the solid S being oriented in an xyz-coordinate frame and having a height along the z-axis, comprising the steps of:

(a) preprocessing the computer-generated specification of S, the step of preprocessing including the steps of,

for each face f_i lying on a boundary of the solid S, constructing a bounding z-axis interval $I_i=[z_{imin}, Z_{imax}]$;

for all i, constructing an enlarged interval $I_i+=[z_{imin}-t, z_{imax}+t]$, where t is a thickness of a shell of S; and

storing the enlarged intervals I+ for subsequent access;

(b) searching the stored enlarged intervals to determine a specification of one slice of the shell of S, including the steps of,

initializing a set of primitive slices Π=NULL; and

for each interval I_i+ that contains a query point z_q that overlaps with a query interval I_q, adding $P\cap\{CL(f_i\oplus B_t)\}$ to Π, where P is a slice plane, cl indicates a closure, and B_t is an open ball of radius t;

(c) merging the set of primitive slices by performing a union of all of the primitive slices in Π to obtain Σ; and

(d) returning $(P\cap S)\cap\Sigma$ as the specification of one slice of the shell of S, including providing the specification of the one slice of the shell of S to a material deposition means for fabricating portion of the object in accordance with the specification of the one slice; and

(e) thereafter operating the system to deposit material by said material deposition means to fabricate a portion of the object in accordance with the specification of the one slice.

5,587,914

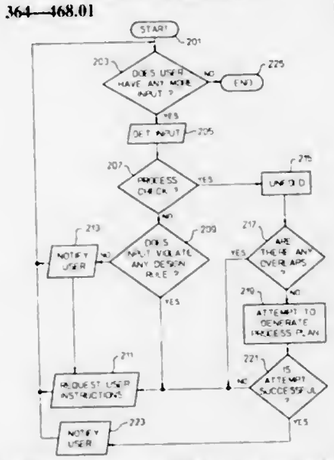
APPARATUS AND METHOD FOR COMPUTER-AIDED DESIGN OF SHEET METAL FABRICATED PARTS

Scott A. Conradson, Palo Alto; Lee A. Barford, Mountain View; William D. Fisher, San Jose; Michael J. Weinstein, Los Altos, and Julie D. Wilker, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 883,243, May 7, 1992, abandoned, which is a continuation of Ser. No. 411,344, Sep. 22, 1989, abandoned. This application Mar. 17, 1995, Ser. No. 406,767

Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—468.01 **17 Claims**



9. An interactive method of designing a mechanical part, the method comprising:

sequentially receiving a plurality of items of data descriptive of a desired mechanical part;

storing a plurality of parameters descriptive of an available manufacturing apparatus, at least one of which describes a tooling constraint;

as each item of data is received, automatically testing whether the part as described by the received items of data satisfies each of a plurality of the parameters, including one of the tooling constraints;

communicating the results of the test such that if the part fails to satisfy any of the parameters any of the items of data can be modified; and

performing the test again after an item of data has been modified.

5,587,915

TOOL DAMAGE PREVENTION SYSTEM

Takashi Nagatomi, Minamitsuru-gun, Japan, assignor to Fanuc Ltd., Japan

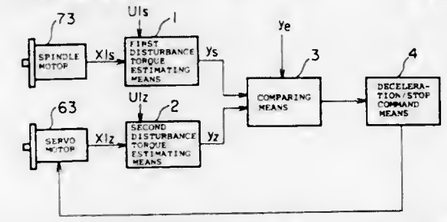
PCT No. PCT/JP94/00668, § 371 Date Dec. 29, 1994, § 102(e) Date Dec. 29, 1994, PCT Pub. No. WO94/26465, PCT Pub. Date Nov. 24, 1994

PCT Filed Apr. 21, 1994, Ser. No. 360,780

Claims priority, application Japan, May 11, 1993, 5-109153; Jun. 10, 1993, 5-138293

Int. Cl.[6] G05B *19/4065*

U.S. Cl. 364—474.19 **4 Claims**



1. A tool damage prevention system for preventing damage to a tool used in a numerically controlled machine tool, comprising:

first disturbance torque estimating means for estimating a disturbance torque acting on a spindle for rotating the tool;

second disturbance torque estimating means for estimating a disturbance torque acting on a feed shaft for controlling feed of the tool;

comparing means for comparing a composite disturbance torque, obtained by combining the disturbance torques estimated by said first and second disturbance torque estimating means, with a preset reference torque; and

deceleration/stop command means for outputting a command signal to decelerate or stop the feed of the tool or to change the tool in accordance with a result of the comparison by said comparing means.

5,587,916

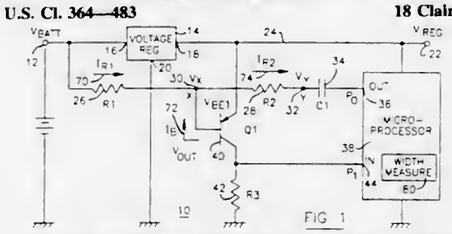
LOW VOLTAGE SENSING CIRCUITS FOR BATTERY POWERED DEVICES HAVING A MICRO-PROCESSOR

Glen D. Martinson, Oakville, Canada, and Stephen T. Makk, Conyers, Ga., assignors to B.E.L.-Tronics Limited, Mississauga, Canada

Filed Aug. 15, 1994, Ser. No. 290,122

Int. Cl.[6] G05F *1/08*

U.S. Cl. 364—483 **18 Claims**



1. A low voltage sensing circuit for a battery powered device having a logic circuit or subsystem, and a voltage regulator; wherein an input direct current voltage from a battery is fed to a voltage regulator having at least an input terminal, an output terminal, and a third terminal connected to ground, wherein the output direct current voltage of said voltage regulator is lower than said input voltage and is fed to the emitter of a PNP transistor and to an input power terminal of a logic circuit or subsystem;

wherein the base of said PNP transistor is connected to a common point in a series resistor voltage divider comprising a first resistor and a second resistor, and the collector of said PNP transistor is connected to one end of a third reference resistor, the other end of which is connected to ground;

wherein the end of said first resistor that is remote from said common point is connected to said input voltage, the end of said second resistor that is remote from said common point is connected to one side of a capacitor, and the other side of said capacitor is connected to an output port of said logic circuit or subsystem;

wherein said collector of said PNP transistor is also connected to an input port of said logic circuit or subsystem;

wherein the voltage at said output port of said logic circuit or subsystem is normally held at said output voltage value, and the voltage at said input port is zero volts with respect to ground; and

means for periodically reducing the voltage at said output port for a predetermined interval of time to zero volts;

wherein the values of each of said first and second resistors are chosen so that, if said input voltage falls below a predetermined value and when said output voltage of said output port of said logic circuit or subsystem is temporarily reduced to zero, said transistor becomes conductive and a voltage appears across said third resistor.

5,587,917

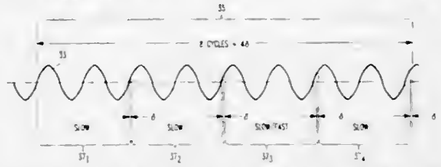
DATA COLLECTION AND PROCESSING FOR DIGITAL AC POWER SYSTEM MONITOR/ANALYZER

Robert T. Elms, Monroeville, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 17, 1994, Ser. No. 325,711

Int. Cl.[6] G01R *21/06*

U.S. Cl. 364—487 **16 Claims**



1. Electrical apparatus for use with an ac electrical power system, said apparatus comprising:

sensing means sensing waveforms in said ac electrical power system;

sampling means for selectively digitally sampling said waveforms sensed by said sensing means at a first sampling rate, or at a second sampling rate which is an integer multiple of said first sampling rate; and

digital processing means determining values of first parameters of said waveforms from samples taken at said first sampling rate, or determining values of second parameters of said waveforms from samples taken at said second sampling rate, in the latter case said digital processing means extracting samples at said first sampling rate from samples taken at said second sampling rate such that said values of said first parameters are determined continuously.

5,587,918

CIRCUIT PATTERN COMPARISON APPARATUS

Susumu Hamada, deceased, late of Mitaka, and Dai Araki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1993, Ser. No. 173,082

Claims priority, application Japan, Dec. 28, 1992, 4-349323; Feb. 19, 1993, 5-030914

Int. Cl.[6] H01L *25/00*

U.S. Cl. 364—488 **29 Claims**

1. A circuit pattern comparison apparatus for extracting portions matched to a designated predetermined search pattern from an object of comparison represented by a circuit network having a set of nodes and node-to-node arcs or links, comprising:

search pattern editing means for schematically describing said designated predetermined search pattern having a plurality of nodes;

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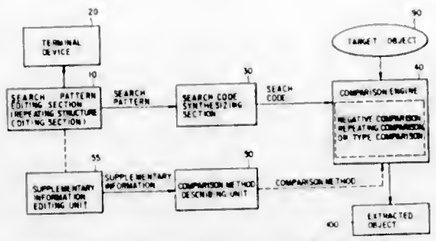


comparison order designating means for designating a comparison order of the nodes contained in the designated predetermined search pattern;

search code synthesizing means for synthesizing at least one search code by subjecting, to code conversion, said designated predetermined search pattern schematically described by said search pattern editing means;

comparing means for comparing the designated predetermined search pattern to the object of comparison utilizing the at least one search code; and

extracting means for extracting at least one portion of the object of comparison matched to said designated predetermined search pattern.

5,587,919

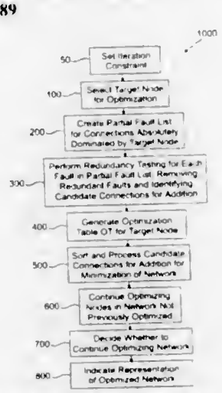
APPARATUS AND METHOD FOR LOGIC OPTIMIZATION BY REDUNDANCY ADDITION AND REMOVAL

Kwang-Ting Cheng, Santa Barbara, Calif., and Luis Entrena, Madrid, Spain, assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Apr. 22, 1994, Ser. No. 233,791

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 **38 Claims**



1. A method of efficiently optimizing a digital logic network through the iterative addition and removal of redundant connections previously identified as candidate connections comprising the steps of:

selecting a target node for optimization;

analyzing the digital logic network to determine if connections to the target node are absolutely dominated by said target node, by determining if each of said connections must pass through the target node before reaching any primary output of the digital logic network;

performing redundancy testing on each fault corresponding to each connection previously determined to be absolutely dominated;

removing from the digital logic network each said fault found redundant;

identifying each candidate connection for addition suggested by an assignment value implicated during redundancy testing; and

adding to the network each said candidate connection found redundant.

5,587,920

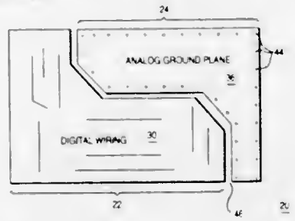
COMPUTER INCLUDING A FARADAY CAGE ON PRINTED CIRCUIT BOARD

Jorge E. Muyshondt, Austin; Gary A. Parker, Round Rock, and Bruce J. Wilkie, Georgetown, all of Tex., assignors to Internatinnal Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 26,888, Mar. 5, 1993, Pat. No. 5,475,606. This application Jun. 7, 1995, Ser. No. 485,703

Int. Cl.[6] H05K *3/00*

U.S. Cl. 364—489 **7 Claims**



1. A computer comprising:

a memory for storing sets of instructions to operate the computer coupled to a system bus;

a processor for executing the stored sets of instructions in the memory coupled to the system bus;

a printed circuit board coupled to the system bus, the board comprising:

a plural number of conductor layers separated by a plural number of insulator layers;

a first section of the board in which signal paths for a first type of active device are defined on which at least one first type of active device is attached;

a second section of the board including a first and a second ground plane disposed in a first and second conductor layer respectively, the ground planes being electrically interconnected at selected peripheral regions forming a Faraday cage, wherein the Faraday cage is formed entirely within the board and also including a third conductor layer disposed between the first and second conductor ground planes in which a plurality of signal paths for a second type of active device are defined to which at least one second type of active device is attached, wherein the signal paths for the second type of active device are protected by the Faraday cage from the signal paths for the first type of active device.

5,587,921

ARRAY OF CONFIGURABLE LOGIC BLOCKS EACH INCLUDING A LOOK UP TABLE HAVING INPUTS COUPLED TO A FIRST MULTIPLEXER AND HAVING OUTPUTS COUPLED TO A SECOND MULTIPLEXER

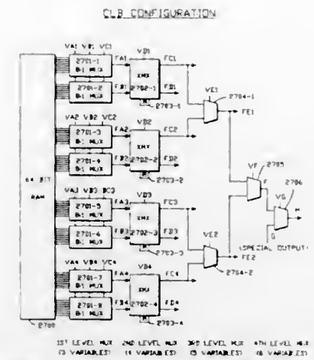
Om P. Agrawal, San Jose; Michael J. Wright, Menlo Park, and Ju Shen, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 462,934, Jun. 5, 1995, Pat. No. 5,469,368, which is a division of Ser. No. 271,872, Jul. 7, 1994, Pat. No. 5,422,823, which is a division of Ser. No. 12,573, Feb. 1, 1993, Pat. No. 5,329,460, which is a division of Ser. No. 394,221, Aug. 15, 1989, Pat. No. 5,212,652. This application Nov. 20, 1995, Ser. No. 560,933

Int. Cl.[6] H03K *17/693*

U.S. Cl. 364—489 **15 Claims**

1. A programmable integrated circuit comprising:



(a) a plurality of programmably configurable logic blocks for carrying out program-defined logic functions; and

(b) a programmably configurable interconnect network for providing program-defined routing of signals between the plurality of programmably configurable logic blocks,

wherein said configurable logic blocks each includes:

(a.1) input signal receiving means distributed about the configurable logic block for conveying a received set of input signals into the configurable logic block;

(a.2) output signal dispensing means distributed about the configurable logic block for dispensing from the configurable logic block, a set of output signals developed within the configurable logic block;

(a.3) to-LUT input-subset selecting means coupled to the input signal receiving means for selecting and outputting a programmably-defined subset of the received set of input signals;

(a.4) first programmable memory means for storing a plurality of lookup bits, said lookup bits defining one or more lookup functions;

(a.5) first lookup bits select means, coupled to the first programmable memory means and to the to-LUT input-subset selecting means, for selecting and outputting a subset of the stored lookup bits in accordance with the subset of input signals output by the to-LUT input-subset selecting means, wherein the combination of the first programmable memory means and the first lookup bits select means defines a first lookup table means (first LUT means); and

(a.6) from-LUT output routing means, coupled to the first LUT means and responsive to supplied routing control signals, for receiving the output subset of stored lookup bits, for partitioning the output subset into a plurality of output sub-subsets and for selectively routing respective ones of said output sub-subsets to a respective one or more of the output signal dispensing means in accordance with the supplied routing control signals.

5,587,922

MULTIDIMENSIONAL SPECTRAL LOAD BALANCING

Bruce A. Hendrickson, and Robert W. Leland, Albuquerque, both of N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Continuation of Ser. No. 78,667, Jun. 16, 1993, abandoned. This application Jul. 15, 1996, Ser. No. 680,718

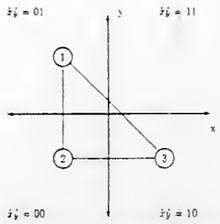
Int. Cl.[6] G06F *15/16; 17/50*

U.S. Cl. 364—489 **13 Claims**

1. A parallel computational system optimized to solve a given problem, comprising:

a) a plurality of computational units;

b) data links connecting pairs of said computational units, said datalinks defining the connection topology of said parallel computational system, and;



c) a procedure to subdivide the given problem among the plurality of computation units, said procedure comprising:

i) constructing a graph corresponding to the given problem, said graph comprising a plurality of vertices representing a corresponding plurality of computational subtasks of the given problem, and a plurality of weighted edges representing information flow between the computational subtasks;

ii) generating a Laplacian matrix of said graph;

iii) computing k eigenvectors of said Laplacian matrix, k being an integer greater than 1;

iv) selecting an orthogonal basis for a space spanned by the eigenvectors;

v) partitioning said computational subtasks into 2^d subsets by means of the orthogonal basis, and;

vi) assigning each of said subsets of computational subtasks to at least one of said computational units in a manner consistent with the connection topology.

5,587,923

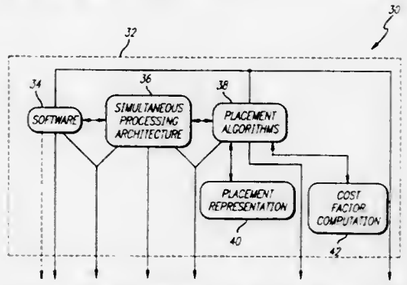
METHOD FOR ESTIMATING ROUTABILITY AND CONGESTION IN A CELL PLACEMENT FOR INTEGRATED CIRCUIT CHIP

Deborah C. Wang, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 7, 1994, Ser. No. 301,687

Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—490 **20 Claims**



1. A computer implemented method for producing a cell placement for a microelectronic integrated circuit, said placement including a plurality of cells interconnected by nets of wiring, the method comprising estimating routing density in said placement by performing the steps, of:

(a) superimposing a pattern of contiguous tiles over said placement, each of said tiles having edges;

(b) constructing bounding boxes around said nets respectively;

(c) calculating, within each bounding box in accordance with a predetermined function, net probable densities of wiring required by said net for each edge respectively; and

(d) summing said net probable densities to produce total probable densities of wiring required by all of said nets for each edge respectively.

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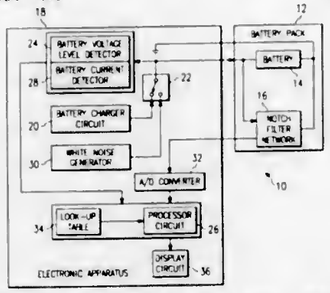
5,587,924
AUTOMATIC SYSTEM FOR HANDLING BATTERIES

Markku J. Rossi, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Mar. 31, 1995, Ser. No. 414,760
Int. Cl.[6] H02J 7/00
U.S. Cl. 364—496 22 Claims



1. A system for determining a battery's energy capacity while the battery is in use in an electronic device, comprising:

a battery pack;

a first set of capacitors mounted in said battery pack comprising at least one capacitor;

a first set of resistors mounting in said battery pack comprising at least one resistor;

an op-amp circuit adapted to connect to said first set of capacitors and said first set of resistors so that a notch filter circuit results;

a noise generator connected to said notch filter;

an analog-to-digital converter connected to said notch filter for receiving a filtered signal and for producing a digital signal that corresponds to said filtered signal;

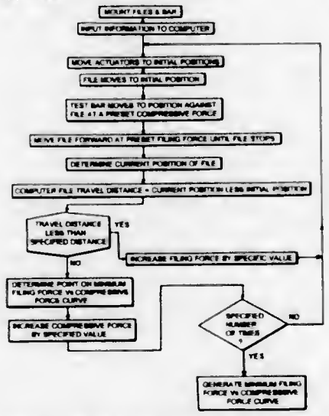
a look-up table; and

a processor circuit connected to said look-up table and to said analog to digital converter for determining the energy capacity of said battery.

5,587,925
FILE TESTING TECHNIQUES

Cheng J. Li, Leominster, Mass., assignor to Simonds Industries, Inc., Fitchburg, Mass.

Filed Nov. 8, 1994, Ser. No. 336,188
Int. Cl.[6] G01M 13/00
U.S. Cl. 364—508 8 Claims



5. A method of testing a file comprising:

(a) mounting a file at an initial position on the surface of a test bar of material at a preset compressive force between the file and the test bar surface;

(b) moving the file over the test bar surface at a first selected filing force until the file stops;

(c) determining the position of the file when it stops and calculating the distance travelled from said initial position;

(d) repeating steps (b) and (c) for a successive number of times at successively increasing filing forces until the distance traveled is equal to a specified distance;

(e) recording a value of the minimum filing force needed to travel the specified distance;

(f) increasing the present compressive force by selected successive values and successively repeating steps (b), (c), (d), and (e) a selected number of times to record the minimum filing force needed at each successive value of the compressive force;

(g) determining a curve of minimum filing force as a function of the selected successive values of compressive force;

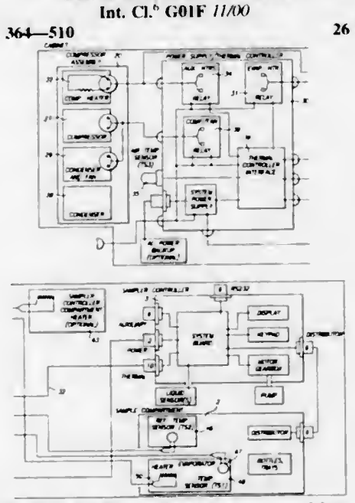
(h) performing steps (a) through (g) for a plurality of different files to be tested; and

(i) comparing the relative values of the curves of minimum filing force values as a function of the selected successive values of compressive forces for said plurality of files to determine the relative sharpness characteristics of said plurality of files.

5,587,926
REFRIGERATED FLUID SAMPLING APPARATUS AND METHOD WITH VARIABLE VOLUME SAMPLING SYSTEM

Francis Chiu, Amherst; William Goss, Buffalo; David Hayes, North Tonawanda; Gary Randolph; Cheryl Sak, both of Lyndonville; Jeff Valery, Lockport, and James Vineski, Bergen, all of N.Y., assignors to American Sigma, Inc., Medina, N.Y.

Continuation-in-part of Ser. No. 219,097, Mar. 29, 1994, Pat. No. 5,506,791, which is a continuation-in-part of Ser. No. 954,288, Sep. 30, 1992, Pat. No. 5,299,141, which is a continuation-in-part of Ser. No. 612,832, Nov. 13, 1990, Pat. No. 5,172,332, which is a continuation-in-part of Ser. No. 455,981, Dec. 22, 1989, Pat. No. 5,091,863. This application Dec. 1, 1994, Ser. No. 348,050
Int. Cl.[6] G01F 11/00
U.S. Cl. 364—510 26 Claims



1. A refrigerated fluid sampling apparatus comprising:

a main housing;

a sample compartment disposed in a lower portion of said main housing;

fluid sampling means, disposed in said main housing, for withdrawing fluid from a fluid channel and delivering fluid samples to said sample compartment;

means for supplying power to said apparatus;

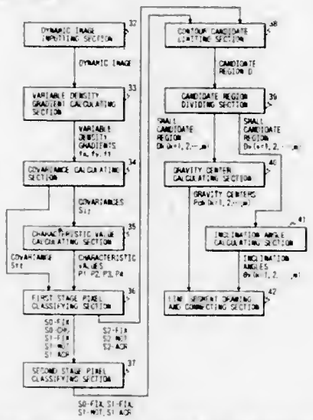
thermal control means for controlling temperatures within said sample compartment, said thermal control means comprising a compressor assembly; and

said compressor assembly being disposed in an upper portion of said main housing, above said sample compartment.

5,587,927
DETECTING APPARATUS FOR DETECTING A CONTOUR OF A MOVING REGION IN A DYNAMIC IMAGE

Kenji Nagao, Watertown, Mass.; Masaki Sohma, Kawasaki, Japan; Shigeru Ando, Chiba, Japan, and Michihiro Kobayakawa, Chigasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 6, 1994, Ser. No. 178,163
Claims priority, application Japan, Mar. 26, 1993, 5-067825
Int. Cl.[6] G06K 9/46
U.S. Cl. 364—514 A 17 Claims



1. A detecting method of a contour of a moving region of a dynamic image for distinguishing a moving object positioned in the moving region, comprising the steps of:

inputting a series of frames of dynamic image which consists of variable densities F(x,y,t) of pixels;

calculating a variable density gradient $fx=\partial F(x,y,t)/\partial x$ defined as an x directional gradient of the variable densities F(x,y,t) for each of the pixels;

calculating a variable density gradient $fy=\partial F(x,y,t)/\partial y$ defined as a y directional gradient of the variable densities F(x,y,t) for each of the pixels;

calculating a variable density gradient $ft=\partial F(x,y,t)/\partial t$ defined as a time-based variation of the variable densities F(x,y,t) for each of the pixels;

calculating covariances Sxx, Sxy, Sxt, Syx, Syy, Syt, Stx, Sty and Stt according to an equation

$$Sij=\iiint(fi*fj)dxdydt\ (i,j\in\{x,y,t\})$$

for each of the pixels by utilizing the variable density gradients fx, fy and ft, integration ranges being limited in a space-time region of an observed pixel selected from the pixels and another space-time region of neighboring pixels positioned near to the observed pixel;

extracting first, second, third and fourth inherent characteristics of the dynamic image by utilizing the covariances Sxx, Sxy, Sxt, Syx, Syy, Syt, Stx, Sty and Stt, the first inherent characteristic being utilized to judge whether or not an observed pixel selected from the pixels is positioned in a texture drawn in the dynamic image, the second inherent characteristic being utilized to judge whether the texture in which the observed pixel is positioned is a one-dimensional texture changing in a direction only or a two-dimensional texture changing in an x-y plane, the third inherent characteristic being utilized to judge whether luminous intensity of the observed pixel positioned in the one-dimensional texture changes in a motional change or a non-motional change, and the fourth inherent characteristic being utilized to judge whether luminous intensity of the observed pixel positioned in the two-dimensional texture changes in the motional change or the non-motional change;

classifying one or more pixels into first or second classification type by utilizing the first to fourth inherent characteristics, the first classification type (S1-ACR) denoting that an observed pixel selected from the pixels is positioned in the one-dimensional texture and the luminous intensity of the observed pixel changes with time in a non-motional change, and the second classification type (S2-ACR) denoting that the observed pixel is positioned in the two-dimensional texture and the luminous intensity of the observed pixel changes with time in the non-motional change;

recognizing first pixels classified into the first classification type and second pixels classified into the second classification type as boundary pixels positioned in a boundary region between the moving region and a static region of the dynamic image and setting a region occupied by the boundary pixels as a candidate region for a contour of the moving region;

detecting a contour of the moving region by adopting a line passing through a middle portion of the candidate region as the contour of the moving region;

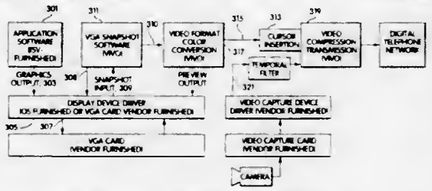
distinguishing a moving object positioned in the moving region of which the contour is detected; and

processing the dynamic image in which the moving object distinguished exists to display the dynamic image in a displaying unit or transfer the dynamic image to an external unit.

5,587,928
COMPUTER TELECONFERENCING METHOD AND APPARATUS

Oliver Jones, Andover; Mary Deshon, Winthrop; Staffan Ericsson, Brookline, all of Mass., and James Flach, Cave Creek, Ariz., assignors to Vivo Software, Inc., Waltham, Mass.

Filed May 13, 1994, Ser. No. 242,271
Int. Cl.[6] H04N 7/10
U.S. Cl. 364—514 A 12 Claims



1. A system for video conferencing, comprising:

a computer including a graphics subsystem in which a computer display image is represented by a digital computer display signal having a first format different from a digital television signal having a second format, the graphics subsystem receiving as an input the digital computer display signal;

means in the computer connected to the graphics subsystem, for obtaining from the graphics subsystem a portion of the digital computer display signal, the portion forming a sequence of frames representative of at least a portion of the computer display image;

means in the computer connected to receive the sequence of frames from the means for obtaining, for converting the sequence of frames of the digital computer display signal of

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the first format into a sequence of frames forming a digital television signal of the second format; and

means in the computer connected to receive the digital television signal, for compressing the digital television signal for transmission to a system for receiving compressed digital television signals.

5,587,929

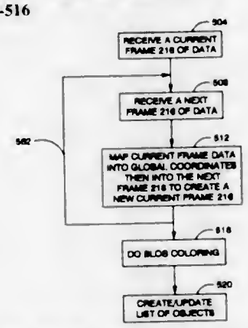
SYSTEM AND METHOD FOR TRACKING OBJECTS USING A DETECTION SYSTEM

Richard B. League, and Norman K. Lay, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 2, 1994, Ser. No. 299,093

Int. Cl.[6] G01S *13/00*

U.S. Cl. 364—516 **8 Claims**



1. A method of tracking objects using a detection system having a sensor that senses objects within a field of view, comprising the steps of:

(A) sensing objects in the field of view of the detector;

(B) generating a current frame of datapoints, wherein said datapoints represent an object sensed in step (A);

(C) converting said datapoints into datapoints represented in global coordinates; and

(D) mapping said converted datapoints into a next frame of datapoints to create a new frame of datapoints, wherein said new frame of datapoints represents objects detected in said next frame as well as objects detected in one or more previous frames,

(E) doing blob coloring on said new frame of datapoints to define objects;

(F) making a list of said objects in step (E): wherein said step (E) comprises the steps of:

i. scanning said new frame to locate a bin having datapoint having a non-zero power value.

5,587,930

FAULT DIAGNOSIS DEVICE

Satoshi Hori; Teruyo Omori, both of Amagasaki, and Makoto Sakagami, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1991, Ser. No. 739,591

Claims priority, application Japan, Jul. 24, 1990, 2-198273

Int. Cl.[6] G01B *7/00*

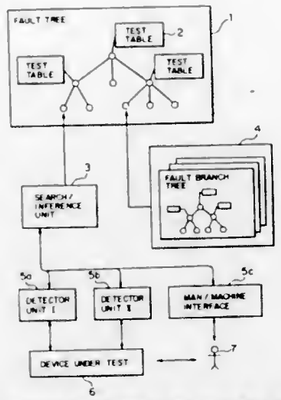
U.S. Cl. 364—551.01 **3 Claims**

1. A fault diagnosis device for determining a cause of fault of a device under test, comprising:

detector means for detecting parameters of a device under test;

memory means;

a fault tree stored in said memory means and having nodes corresponding to respective sub-units of said device under test, whereby said fault tree has a tree structure corresponding to a hardware organization of said device under test;



test tables stored in said memory and associated with respective nodes of said fault tree, each test table including: a description of at least one parameter to be detected by said detector means; at least one test condition with respect to the parameter detected by said detector means; and a fault probability table representing fault probabilities and names of child nodes corresponding to respective results of said test condition; and

search/inference means for searching for and determining a cause of fault of said device under test in accordance with said fault tree and said test tables;

wherein at least one of said nodes has at least three child nodes and the test table associated with the node having at least three child nodes includes: a description of at least two parameters to be detected by said detector means; at least two test conditions with respect to the two parameters detected by said detector means; and a fault probability table representing fault probabilities and names of child nodes corresponding to respective patterns of results of said test conditions.

5,587,931

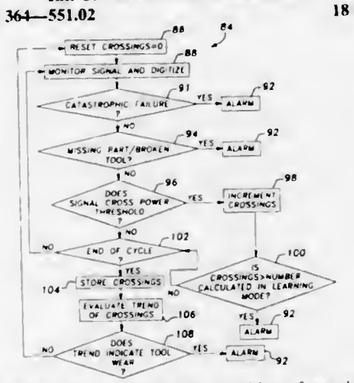
TOOL CONDITION MONITORING SYSTEM

Joel W. Jones, and Ya Wu, both of Windsor, Canada, assignors to Tri-Way Machine Ltd., Windsor, Canada

Filed Oct. 20, 1995, Ser. No. 546,361

Int. Cl.[6] G05B *23/02;* **G08B** *21/00*

U.S. Cl. 364—551.02 **18 Claims**



1. A method for monitoring the condition of an electrically powered tool of a selected tool type performing a cyclical task comprising the steps of:

a. using a tool to perform a cyclical task and measuring a power consumption signal of said tool as said tool performs said cyclical task;

b. decomposing said power consumption signal of said tool into components by converting said power consumption signal into time segments, each time segment having a digital value equivalent to the analog value of said signal at said time, and decomposing said time segments of said power consumption signal into different frequency components using a mathematical algorithm;

c. selecting feature components of said power consumption signal;

d. using said selected components of said power consumption signal to set a power threshold in a learning cycle;

e. using a tool to perform a cyclic task and monitoring its power consumption signal; and

f. identifying a worn condition of the tool of step e. based upon a comparison of said power consumption signal with said predetermined power threshold of step d.

5,587,932

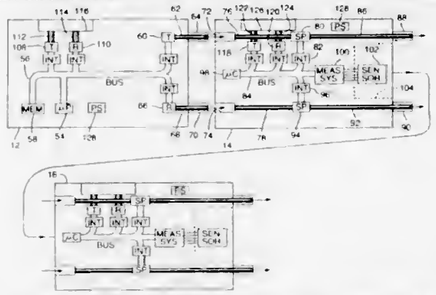
ON-BOARD MEASUREMENT SYSTEM

Joseph V. Ferrante, Redmond; Mark E. Lockman, Everett; Donald P. Matson, Mukilteo; John A. Gibbs, Lynnwood, and Warren H. Wong, Seattle, all of Wash., assignors to Fluke Corporation, Everett, Wash.

Filed Aug. 4, 1994, Ser. No. 285,952

Int. Cl.[6] G06F *15/00;17/40*

U.S. Cl. 364—556 **33 Claims**



1. Apparatus for logging parameters to which a movable unit in a process environment is subjected, said apparatus comprising:

a plurality of separable modules including at least one measurement module provided with sensor means for measuring an environmental parameter, and at least one control module for operating said measurement module;

said control module including microprocessor means for programming a measurement sequence, detachable interface means for connection to an external command center, and memory means for storing instructions and measured data;

attachment means for removably attaching said measurement and control modules physically to said unit for movement with said unit;

first linking means positioned in communicating relation between said measurement and control modules when said modules are physically attached to said unit for transmitting instructions from said control module to said measurement module in order to direct measurement of said parameters and for returning data from said measurement module to said control module for storage in said memory means; and

said measurement module including second linking means adaptable for communication between said measurement module and another measurement module for transmitting instructions from said control module to said other measurement module, and said first and second linking means being operable separately from said detachable interface means so as to facilitate simultaneous data transmittal by said measurement module and connection of said control module to an external command center.

5,587,933

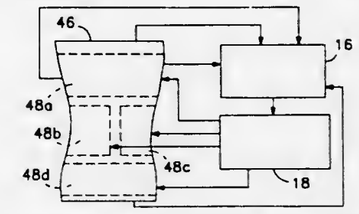
SUPPORT ENHANCING DEVICE AND ASSOCIATED METHOD

Clifford M. Gross, Roslyn, N.Y., assignor to BCAM International, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 277,230, Jul. 19, 1994. This application Nov. 16, 1994, Ser. No. 340,541

Int. Cl.[6] A61H *7/00;1/00;* **G06F** *15/00*

U.S. Cl. 364—558 **32 Claims**



1. A method for supporting an animate object, comprising the steps of:

(a) providing a structure defining a configurable contoured support surface;

(b) placing a part of the object in contact with said support surface;

(c) automatically measuring an input parameter to determine a pressure distribution on the part of the animate object in contact with the support structure;

(d) automatically determining an optimal pressure distribution wherein comfort of the object's part is maximized according to an empirical regression equation or table;

(e) automatically subjecting said support surface, in response to the selected optimal comfort pressure, to forces tending to modify a contour of said support surface ; and

(f) periodically and automatically altering said forces exerted on said support surface so as to provide a cyclic massage to the object's part.

5,587,934

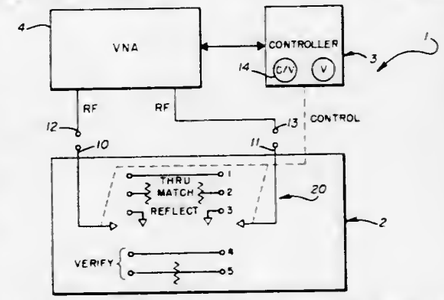
AUTOMATIC VNA CALIBRATION APPARATUS

William W. Oldfield, Redwood City, Calif.; Thomas R. Brinkoetter, Portland, Oreg., and Todd D. Antes, San Jose, Calif., assignors to Wiltron Company, Morgan Hill, Calif.

Continuation-in-part of Ser. No. 140,781, Oct. 21, 1993, abandoned. This application Apr. 10, 1996, Ser. No. 630,195

Int. Cl.[6] G01R *27/06*

U.S. Cl. 364—571.01 **10 Claims**



6. A calibration apparatus for use in calibrating a Vector Network Analyzer (VNA), the VNA having a first and a second terminal, the calibration apparatus comprising:

a first terminal for connecting to the first terminal of the VNA;

a second terminal for connecting to the second terminal of the VNA;

a first set of reflection components;

a second set of reflection components;

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a through line, wherein the first set of reflection components, second set of reflection components and the through line provide a set of known scattering parameters which enable calculation of calibration values used to correct errors introduced by the VNA;

a first switch having a first end connected to the first terminal of the calibration apparatus and a second end selectively connectable to individual ones of the first set of reflection components and the through line;

a second switch having a first end connected to the second terminal of the calibration apparatus and a second end selectively connectable to individual ones of the second set of reflection components and the through line; and

a controller coupled to the first and second switch for enabling the second end of the first switch to be selectively connectable to individual ones of the first set of reflection components and the through line, and for enabling the second end of the second switch to be selectively connectable to individual ones of the second set of reflection components and the through line.

5,587,935

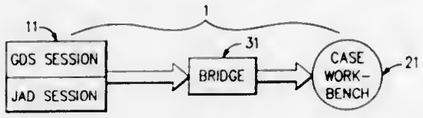
INTEGRATED SOFTWARE DEVELOPMENT SYSTEM INCLUDING GROUP DECISION SUPPORT SUBSYSTEM, APPLICATION DEVELOPMENT SUBSYSTEM, AND BRIDGE SUBSYSTEM THEREBETWEEN

Jeffrey S. Brooks, Greene, and Stephen L. Dohanich, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1991, Ser. No. 812,598

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **1 Claim**



1. An integrated system for creating a process model and writing software based on the process model, including a group decision support subsystem for creating and ordering a process model according to a protocol, an application development subsystem for writing software based on the output of the group decision support subsystem and a bridge sub-system therebetween for converting output of the group decision support subsystem into input of the application development subsystem, wherein:

a. said group decision support subsystem comprises one or more of:

(1). means for substantially simultaneously and anonymously collecting information, and exchanging ideas and comments about the said information from participants;

(2). issue analysis and idea organization means for the participants to group, categorize and define issues and ideas from the collected information;

(3). voting application means and alternative evaluation means for the participants to rank and prioritize issues and ideas;

(4). topic commenter means for participants to view and comment upon issues and ideas; and

(5). dictionary means;

b. said application development subsystem comprises rules repository means; and

c. said bridge subsystem comprises means to convert the output of the group decision support subsystem to compatible input of the application development subsystem, including:

(1). means for opening output of the group decision support subsystem and scanning directories thereof for object files;

(2). means for creating and opening initially empty input files of the application development subsystem;

(3). means for parsing an object file output of the group decision support system into object names and object definitions to determine the file contents of the group decision support subsystem output file, and thereafter writing the dissected object names and object definitions into application development subsystem files;

(4). means for building application development subsystem compatible files and writing the application development subsystem compatible files to the application development subsystem, comprising:

i. means to remove the software system delimiters and protocols inserted by the group decision support system;

ii. means to concatenate token numbers to name data and property codes to support data; and

iii. means for uniformly writing out the application development subsystem files.

5,587,936

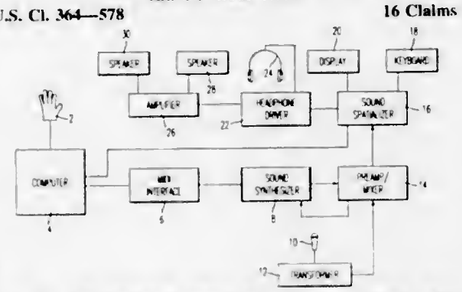
METHOD AND APPARATUS FOR CREATING SOUNDS IN A VIRTUAL WORLD BY SIMULATING SOUND IN SPECIFIC LOCATIONS IN SPACE AND GENERATING SOUNDS AS TOUCH FEEDBACK

David A. Levitt, Menlo Park; Marc Degroot, San Francisco, and Jaron Z. Lanier, Palo Alto, all of Calif., assignors to VPL Research, Inc., Redwood City, Calif.

Continuation of Ser. No. 621,446, Nov. 30, 1990, abandoned. This application Oct. 5, 1993, Ser. No. 141,203

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **16 Claims**



1. An audio feedback system for use with a virtual reality system, comprising:

means for calculating a virtual world;

a sensor, connected to the means for calculating, for sensing information of a person's hand;

an audio feedback determining means, connected to the means for calculating and the sensor, for determining if audio feedback is to be generated, using information of the virtual world and the information of the person's hand; and

a sound generator for generating sound in response to the determination made by the audio feedback determining means.

5,587,937

FORCE REFLECTING HAPTIC INTERFACE

Thomas H. Massie, Vanceburg, Ky., and J. Kenneth Salisbury, Jr., Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

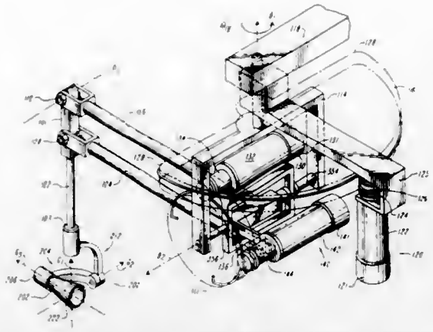
Continuation of Ser. No. 130,639, Oct. 1, 1993. This application Apr. 25, 1995, Ser. No. 429,266

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—578 **9 Claims**

1. A transmission comprising:

a. a first rotary element, having a first portion and a second portion, said first and second portions being rotatable relative to each other, said second portion being connected through a cable to a reference;



b. a second rotary element, also having a first portion and a second portion, said first and second portions of said second rotary element being rotatable relative to each other, said second portion of said second rotary element being connected through said cable to said reference;

c. a kinematic connection from said first portion of said first rotary element to a specified point; and

d. a kinematic connection from said first portion of said second rotary element to said specified point.

5,587,938

METHOD AND DEVICE FOR MANEUVERING A MOTOR VEHICLE OUT OF A PARKING SPACE

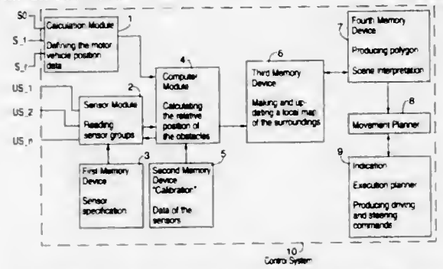
Juergen Hoetzel, Michelstadt, Germany, assignor to Robert Bosch GmbH

Continuation of Ser. No. 289,355, Aug. 11, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,593

Claims priority, application Germany, Sep. 29, 1993, 43 33 112.2

Int. Cl.[6] G06F *7/70*

U.S. Cl. 364—578 **6 Claims**



1. A method for maneuvering a vehicle out of a parking space, comprising the steps of:

measuring, with at least one sensor mounted on the vehicle, a clearance of an obstacle in a driving direction of the vehicle;

producing a local map of a surrounding area of the vehicle as a function of the measured clearance and motor vehicle position data;

producing a model of the surrounding area as a function of the local map;

determining, in an open-loop control system coupled to the at least one sensor, a driving strategy for maneuvering the vehicle out of the parking space as a function of the model; and

displaying, for a driver of the vehicle, information indicative of the driving strategy for maneuvering the vehicle out of the parking space.

5,587,939

HALF-BAND FILTER FOR A CELLULAR GROUP DEMULTIPLEXER

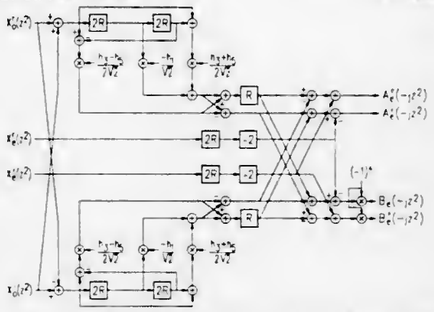
Mohammad R. Soleymani, Beaconsfield, and Yousef Shayan, Kirkland, both of Canada, assignors to Spar Aerospace Limited, Mississauga, Canada

Continuation of Ser. No. 249,143, May 25, 1994, abandoned. This application Feb. 29, 1996, Ser. No. 608,940

Claims priority, application Canada, May 2, 1994, 2122652

Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—724.16 **13 Claims**



1. A half-band filter of order N=4m−1, where m is any positive integer, for use in a cellular group demultiplexer for demultiplexing N-channel frequency multiplexed signals including even and odd numbered samples, the even and odd numbered samples each having real and imaginary parts, said half-band filter comprising:

signal receiving means for separately receiving the real and imaginary parts of the odd numbered samples and for separately receiving the real and imaginary parts of the even numbered samples, said signal receiving means having an upper output and a lower output;

an upper half having an input and an output, said input of said upper half being connected to said upper output of said signal receiving means;

a lower half having an input and an output, said input of said lower half being connected to said lower output of said signal receiving means; and

signal combining/outputting means for combining signals exiting said outputs of said upper and lower halves and for outputting signals $A_e^0(-jz^2)$, $A_e^1(-jz^2)$, $B_e^0(-jz^2)$, $B_e^1(-jz^2)$, an input of said signal combining/outputting means being connected to said outputs of said upper and lower halves;

said signal receiving means comprising:

first adder means for adding the real and imaginary parts of the odd numbered samples to obtain a signal $x_{1\ up}[n]$ at said upper output;

first subtracter means for subtracting the real part of the odd numbered samples from the imaginary part of the odd numbered samples to obtain a signal $x_{1\ low}[n]$ at said lower output;

means for passing the real part of the even numbered samples to a delaying/dividing means of said upper half; and

means for passing the imaginary part of the even numbered samples to a delaying/dividing means of said lower half;

said upper half comprising:

an upper filter section, said upper filter section receiving the signal $x_{1\ up}[n]$ from said signal receiving means and outputting signals $y_{1\ up}[n]$ and $y_{2\ up}[n]$ to said signal combining/outputting means; and

delaying/dividing means for dividing by two and for delaying the real part of the even numbered samples such that the delayed and divided real part of the even numbered samples arrive at said input of said signal combining/outputting means in timed coordination with the odd numbered samples of signals $y_{1\ up}[n]$ and $y_{2\ up}[n]$;

said lower half comprising:

a lower filter section which is symmetric with said upper filter section, said lower filter section receiving the signal $x_{1\ low}[n]$ from said signal receiving means, and outputting signals $y_{1\ low}[n]$ and $y_{2\ low}[n]$ to said signal combining/outputting means; and

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delaying/dividing means for dividing by two and for delaying the imaginary part of the even numbered samples such that the delayed and divided imaginary part of the even numbered samples arrive at said input of said signal combining/outputting means in timed coordination with the odd numbered samples of signals $y_{1\ lim}$ [n] and $y_{2\ lim}$ [n];

each of said upper and lower filter sections comprising:

m−1 serially connected shift registers, each of said m−1 shift registers for delaying signal samples passing therethrough by 2 kT, wherein T is the time duration between two successive samples, the input to the first of said m−1 shift registered receiving the signal $x_{1\ upflow}$ [n] from said upper/lower outputs of said signal receiving means;

filter section adder means;

filter section subtracter means;

m multipliers, each of said m multipliers for multiplying signal samples passing therethrough by a coefficient, the inputs to the m, (m−2), . . . and 1st (for odd m), or 2nd (for even m), multipliers being connected to said m−1 shift registers via said filter section adder means and the inputs to the (m−1), (m−3), . . . and 1st multipliers being connected to said m−1 shift registers via said filter section subtractor means such that the signal samples entering said m multiplier are obtained by adding the signal samples exiting the last of said m−1 shift registers to the signal samples entering the first of said m−1 shift registers, such that the signal samples entering said (m−1) multiplier are obtained by subtracting the signal samples exiting said last of said m−1 shift registers from the signal samples entering said first of said m−1 shift registers, such that the signal samples entering said (m−2) multiplier are obtained by adding the signal samples exiting the penultimate of said m−1 shift registers to the signal samples entering the second of said m−1 shift registers, such that the signal samples entering said (m−3) multiplier are obtained by subtracting said signal samples exiting the penultimate of said m−1 shift registers from the signal samples entering said second of said m−1 shift registers and so forth, . . . ; and

means for combining the signal samples exiting said m multipliers to obtain signals $y_{1\ upflow}$ [n] and $y_{2\ upflow}$ [n].

5,587,940

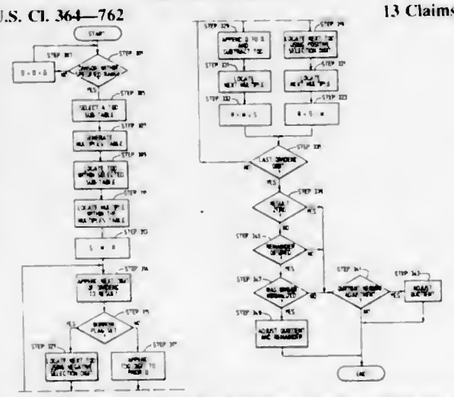
NON-HEURISTIC DECIMAL DIVIDE METHOD AND APPARATUS

David E. Ferguson, Fawnskin, Calif., assignor to Amalgamated Software of North America, Inc., Big Bear Lake, Calif.

Filed Nov. 12, 1993, Ser. No. 152,423

Int. Cl.[6] G06F *7/52*

U.S. Cl. 364—762 **13 Claims**



1. A computer apparatus for generating a quotient from a normalized divisor and a dividend, comprising:

(a) a data storage system; and

(b) at least one processor, coupled to the data storage system, and programmed to perform the following functions:

(1) storing a trial quotient digit (TQD) table in the data storage system;

(2) generating a current sub-dividend from the dividend;

(3) selecting a TQD from the stored TQD table using at least the first and second digits of the current sub-dividend, and the first and second digits of the normalized divisor;

(4) storing in the data storage system multiples of the normalized divisor, each multiple corresponding to a unique TQD value;

(5) selecting the multiple corresponding to each selected TQD;

(6) mathematically combining the selected multiple with the current sub-dividend to derive a result which is indicative of whether a current TQD is an actual quotient digit;

(7) defining a first selected TQD as a partial quotient, and thereafter appending each selected TQD to the partial quotient; and

(8) correcting the partial quotient in one computational operation if the current TQD is not the actual quotient digit.

5,587,941

Patent Not Issued For This Number

5,587,942

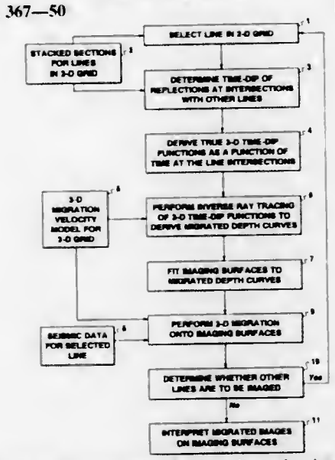
3D WAVE EQUATION MIGRATION OF A 2D GRID OF SEISMIC DATA

Jerome R. Krebs, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 2, 1994, Ser. No. 205,010

Int. Cl.[6] G01V *1/00*

U.S. Cl. 367—50 **17 Claims**



1. A method for determining the three dimensional structure of a subsurface region of the earth, said method involving seismic data acquired on a two dimensional grid of intersecting lines, said method comprising the steps of:

a) determining the three dimensional spatial reference of structural features corresponding to each of a plurality of said intersections by determining at least one three dimensional depth curve for each of said plurality of said intersections;

b) for each of a plurality of said lines, using said three dimensional depth curves corresponding to said intersections in said line to determine at least one three dimensional imaging surface; and

c) determining said three dimensional structure of said subsurface region by performing three dimensional migration of said seismic data to said imaging surface.

5,587,943

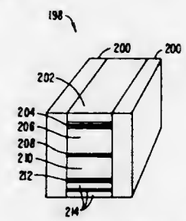
NONVOLATILE MAGNETORESISTIVE MEMORY WITH FULLY CLOSED FLUX OPERATION

James Torok, Minneapolis, Minn., and Richard Spitzer, Berkeley, Calif., assignors to Integrated Microtransducer Electronics Corporation, Berkeley, Calif.

Filed Feb. 13, 1995, Ser. No. 388,035

Int. Cl.[6] G11C *11/15*

U.S. Cl. 365—158 **68 Claims**



1. A memory cell comprising a storage element having a first structure, the first structure having a plurality of layers, selected layers having magnetization vectors associated therewith, the first structure exhibiting giant magnetoresistance, wherein the storage element has a closed flux structure in at least one dimension, and wherein the magnetization vectors are substantially confined to the at least one dimension during all stages of operation of the storage element.

5,587,944

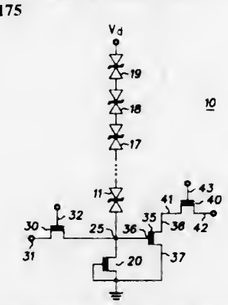
HIGH DENSITY MULTISTATE SRAM AND CELL

Jun Shen, Phoenix, and Herbert Goronkin, Tempe, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Mar. 18, 1996, Ser. No. 617,247

Int. Cl.[6] G11C *11/36*

U.S. Cl. 365—175 **18 Claims**



1. A high density multistate SRAM cell comprising:

N negative differential resistance diodes connected in series and connected to a load, the negative differential resistance diodes and the load defining a memory node therebetween having N+1 stable states;

a write device having a control terminal, an input terminal adapted to receive N+1 different amplitudes of voltage thereon, and an output terminal connected to the memory node;

an amplifier having an input terminal connected to the memory node and an output terminal; and

a read switch having an input terminal connected to the output terminal of the amplifier and an output terminal.

5,587,945

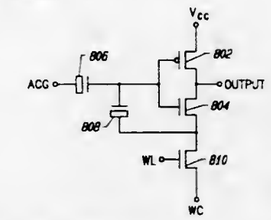
CMOS EEPROM CELL WITH TUNNELING WINDOW IN THE READ PATH

Jonathan Lin, Milpitas; Jack Z. Peng, San Jose; Radu Barsan, Cupertino, and Sunil Mehta, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 6, 1995, Ser. No. 554,092

Int. Cl.[6] G11C *16/02*

U.S. Cl. 365—185.1 **6 Claims**



1. A memory cell comprising:

a PMOS transistor having a drain forming an output node, a source and a channel between the source and drain underlying a common floating gate;

an NMOS transistor having a drain coupled to the output node, a source and a channel between the source and drain of the NMOS transistor underlying the common floating gate;

a capacitor having a first terminal forming a control gate and a second terminal coupled to the common floating gate;

a tunneling capacitor having a first terminal coupled to the common floating gate and a second terminal coupled to the source of the NMOS transistor.

5,587,946

METHOD OF READING, ERASING AND PROGRAMMING A NONVOLATILE FLASH-EEPROM MEMORY ARRRAY USING SOURCE LINE SWITCHING TRANSISTORS

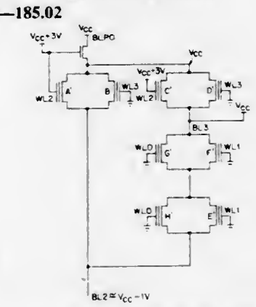
Giovanni Campardo, Bergamo; Giuseppe Crisenza, Trezzo Sull'Adda, and Marco Dallabora, Melegnano, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 15, 1994, Ser. No. 212,907

Claims priority, application European Pat. Off., Mar. 18, 1993, 93830110

Int. Cl.[6] G11C *16/02*

U.S. Cl. 365—185.02 **4 Claims**



3. A method for reading a flash-EEPROM memory array having a plurality of memory cells, comprising the steps of:

setting a selected word line to a first predetermined voltage.

setting a selected bit line to a second predetermined voltage less than said first predetermined voltage and greater than a zero voltage;

setting nonselected bit lines to a third predetermined voltage between said first and second predetermined voltages;

setting nonselected word lines to the zero voltage;

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setting a source line corresponding to a selected memory cell to said third predetermined voltage; and

reading the state of said selected memory cell which is connected to said selected bit line and said selected word line.

5,587,947

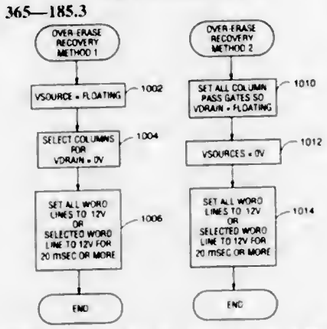
LOW VOLTAGE ONE TRANSISTOR FLASH EEPROM CELL USING FOWLER-NORDHEIM PROGRAMMING AND ERASE

Shang-De Chang, Fremont; Jia-Hwang Chang, Cupertino, and Edwin Chow, Saratoga, all of Calif., assignors to Rohm Corporation, San Jose, Calif.

Division of Ser. No. 205,327, Mar. 3, 1994. This application Sep. 27, 1995, Ser. No. 534,691

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.3 **3 Claims**



1. A method of identifying and repairing over-erased cells in an electrically erasable and programmable device of the type having a plurality of cells each comprising a single transistor having a source, a drain, a control gate, and a floating gate positioned between the control gate and the source and drain and wherein Fowler-Nordheim tunneling is used for tunneling electrons from the source to the floating gate and for tunneling electrons from the floating gate to the drain and further of the type having a plurality of row address lines each coupled to the control gates of the cells in an associated row, a plurality of column address lines each coupled to the drains of the cells in an associated column, and a plurality of source lines coupled to the sources of the cells, the method comprising the steps of:

(a) separately testing each column for the presence of over-erased cells;

(b) individually testing the cells in columns found to have over-erased cells to determine which cells are over-erased; and

(c) repairing the cells found to be over-erased by

(i) applying a first voltage to the row address lines associated with the control gates of the over-erased cells;

(ii) grounding the source lines associated with the sources of the over-erased cells; and

(iii) floating the column address lines associated with the drains of the over-erased cells.

5,587,948

NONVOLATILE SEMICONDUCTOR MEMORY WITH NAND STRUCTURE MEMORY ARRAYS

Hiroto Nakai, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kyoto, Japan

Filed Jun. 14, 1995, Ser. No. 490,167

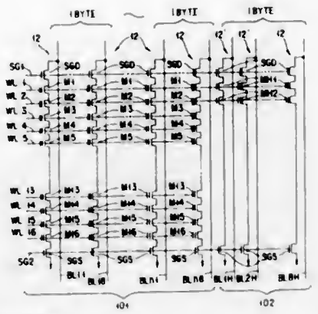
Claims priority, application Japan, Jun. 17, 1994, 6-135814

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.17 **6 Claims**

1. A nonvolatile semiconductor memory comprising:

a first bit line;



a second bit line;

a plurality of select gate lines;

a source line;

a memory cell array comprising a plurality of first NAND strings in a first memory cell area and a plurality of second NAND strings in a second memory cell area, each of the first NAND strings comprising a select gate transistor and i nonvolatile memory cells, which are connected in series between said first bit line and said source line, each of the second NAND strings comprising a select gate transistor and j nonvolatile memory cells, which are connected in series between said second bit line and said source line, said i nonvolatile memory cells being greater in number than said j nonvolatile memory cells; and

decoding means for selecting those of said first NAND strings and those of said second NAND strings, which are connected to a selected one of said select gate lines.

5,587,949

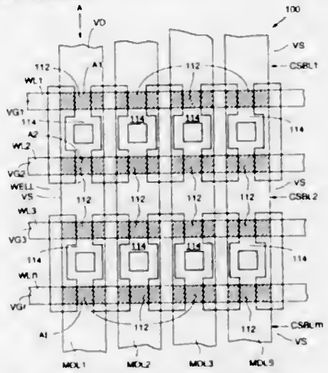
METHOD FOR PROGRAMMING AN ETOX EPROM OR FLASH MEMORY WHEN CELLS OF THE ARRAY ARE FORMED TO STORE MULTIPLE BITS OF DATA

Albert Bergemont, and Min-hwa Chi, both of Palo Alto, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 27, 1995, Ser. No. 429,644

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—185.24 **20 Claims**



1. A method for programming a memory array,

the array having a plurality of memory cells formed in columns and rows, a plurality of common source bit lines arranged so that two rows of memory cells are formed between each pair of adjacent common source bit lines, a plurality of drain regions formed in columns and rows so that one row of drain regions is formed between each pair of adjacent common source bit lines, and so that, in each column of memory cells, one drain region is formed between each pair of memory cells that are formed between adjacent rows of common source bit lines, a plurality of word lines formed so that one word line is formed over each of the memory cells in a row of memory cells, and a plurality of metal drain lines formed so that one metal drain line contacts each of the drain regions in a column of drain regions, each memory cell being formed to produce a punchthrough current during programming, the array being formed in a well, the method comprising the steps of:

identifying a memory cell in a column of memory cells that is to be programmed from an erased threshold voltage to a first threshold voltage, and a memory cell in the column of memory cells that is to be programmed from the erased threshold voltage to a second threshold voltage;

applying a first voltage to the metal drain line that corresponds to the column of memory cells;

applying a second voltage to the common source bit lines, the second voltage being less than the first voltage;

applying the second voltage to the well; and

applying a programming voltage that corresponds to the first threshold voltage to the word line that corresponds to the memory cell in the column of memory cells that is to be programmed to the first threshold voltage, and a programming voltage that corresponds to the second threshold voltage to the word line that corresponds to the memory cell in the column of memory cells that is to be programmed to the second threshold voltage.

5,587,950

TEST CIRCUIT IN CLOCK SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE

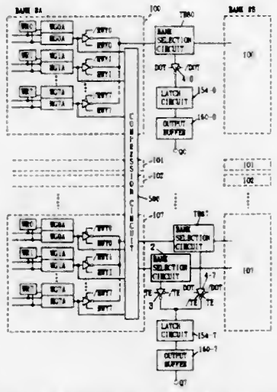
Seiji Sawada, and Yasuhiro Konishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 246,582, May 19, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 461,907

Claims priority, application Japan, May 25, 1993, 5-122439

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—201 **3 Claims**



2. A synchronous semiconductor memory device incorporating external signals in synchronization with a clock signal formed of a series of pulses, said synchronous semiconductor memory device comprising:

a plurality of data input terminal;

selection means for simultaneously selecting a group of a predetermined number of memory cells for each of said plurality of data input terminals for writing data applied sequentially to each of said plurality of data input terminals in synchronization with the clock signal; and

write means for simultaneously writing test data being supplied to each of said plurality of data input terminals in one clock cycle in corresponding groups of said predetermined number of memory cells selected by said selection means in response to a test mode designating signal.

5,587,951

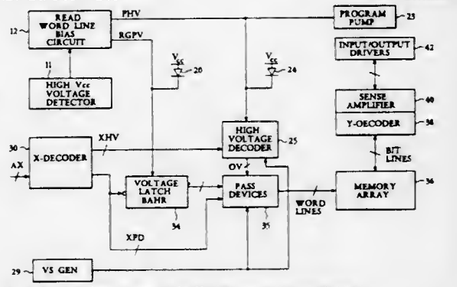
HIGH SPEED, LOW VOLTAGE NON-VOLATILE MEMORY

Mehdi Jazayeri; Edward S. Hui, both of Cupertino, and George J. Korsh, Redwood City, all of Calif., assignors to Atmel Corporation, San Jose, Calif.

Filed Aug. 4, 1995, Ser. No. 511,311

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—203 **34 Claims**



1. A low voltage non-volatile memory comprising,

a memory array of rows and columns of nonvolatile memory cells with each row identified by a word line and each column identified by a bit line and each cell addressable through a word line and a bit line, said bit lines coupled through sense amplifiers to output driving circuitry, and

an input means associated with said array for initiating a read operation, said input means being coupled to an oscillator responsive to a read operation and coupled to a voltage pump circuit responsive to a read operation, said oscillator being coupled to a frequency control input of said voltage pump circuit, and said voltage pump circuit being coupled to a word line.

5,587,952

DYNAMIC RANDOM ACCESS MEMORY INCLUDING READ PREAMPLIFIERS ACTIVATED BEFORE REWRITE AMPLIFIERS

Goro Kitsukawa, Hinodemachi; Takao Watanabe, Kokubunji; Ryoichi Hori, Hinodemachi; Noriyuki Honma, Kokubunji; Kunihiko Yamaguchi, Sayama, and Kiyoo Itoh, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 35,272, Mar. 22, 1993, abandoned, which is a division of Ser. No. 921,385, Jul. 30, 1992, abandoned, which is a continuation of Ser. No. 308,680, Feb. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 803,673, Dec. 2, 1985, abandoned, and Ser. No. 170,623, Mar. 17, 1988, Pat. No. 4,813,020, which is a continuation of Ser. No. 825,939, Feb. 4, 1986, abandoned. This application Feb. 21, 1995, Ser. No. 391,537

Claims priority, application Japan, Dec. 17, 1984, 59-264466

Int. Cl.[6] G11C *11/409;7/06*

U.S. Cl. 365—207 **26 Claims**

1. A dynamic random access memory comprising:

a memory cell;

a word line for accessing said memory cell;

a first data line crossing said word line for transferring a signal voltage from said memory cell;

a second data line crossing said word line;

a rewrite amplifier simultaneously coupled to said first and second data lines when amplifying a voltage difference between the signal voltage from said memory cell on said first data line and a voltage on said second data line, for rewriting

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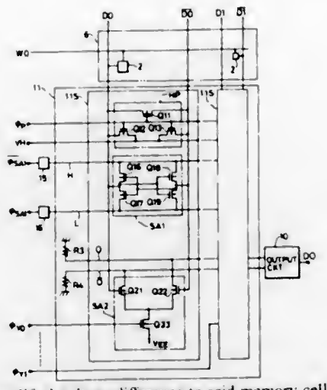


the amplified voltage difference to said memory cell, wherein the memory cell is directly connected to said rewrite amplifier through said first data line;

a read sense circuit for sensing the voltage difference between the signal voltage from said memory cell on said first data line and the voltage on said second data line; and

a common data line pair coupled to output terminals of said read sense circuit,

wherein said read sense circuit has two insulated gate field-effect transistors, gates of which are respectively coupled to said first and second data lines to receive voltages thereon, and source/drain paths of which are coupled to said common data line pair, and

wherein said read sense circuit is activated to sense the voltage difference between the signal voltage from said memory cell on said first data line and the voltage on said second data line and to provide an output to the common data line pair before said rewrite amplifier is activated to amplify the voltage difference between the signal voltage from said memory cell on said first data line and the voltage on said second data line.

5,587,953

FIRST-IN-FIRST-OUT BUFFER MEMORY

Chan H. Chung, Bubaleub, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Inc., Rep. of Korea

Filed Jul. 6, 1995, Ser. No. 499,087

Claims priority, application Rep. of Korea, Jul. 6, 1994, 1994-16143

Int. Cl.[6] **G11C** *7/00*

U.S. Cl. 365—220 **3 Claims**

1. A first-in first-out buffer memory comprising:

a core memory having a dual port, for substantially storing data;

first and second address decoders responsive to read and write clock signals, for producing addresses indicative of directing a location in the core memory, when data is written in the core memory, or when the data is read from the core memory; and

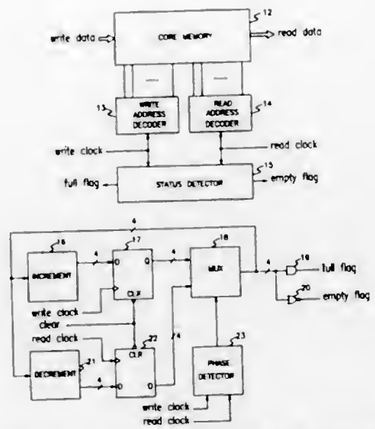
a status detector for generating memory status signals indicating whether the data can be written in the core memory or whether the data can be read from the core memory,

said status detector comprising,

first and second flip-flops for providing input signals thereof to output terminals thereof in accordance with the write and read clock signals, respectively, each having a clear terminal and a clock terminal;

a multiplexer for receiving the output signals of the flip-flops and selecting one of them in response to a selection control signal;

a phase detector for generating the selection control signal in response to the write and read clock signals to control selecting operation of the multiplexer;



a first AND gate for receiving output data of the multiplexer and generating a full flag on the basis of AND logic function thereof;

a NOR gate for receiving the output data of the multiplexer and generating an empty flag on the basis of NOR logic function thereof;

an increment circuit for incrementing the output data of the multiplexer by one and providing incremented signal to the input of the first flip-flop; and

a decrement circuit for decrementing the output data of the multiplexer by one and providing decremented signal to the input of the second flip-flop.

5,587,954

RANDOM ACCESS MEMORY ARRANGED FOR OPERATING SYNCHRONOUSLY WITH A MICROPROCESSOR AND A SYSTEM INCLUDING A DATA PROCESSOR, A SYNCHRONOUS DRAM, A PERIPHERAL DEVICE, AND A SYSTEM CLOCK

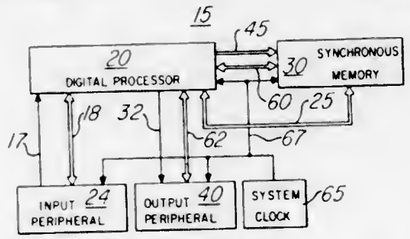
Wilbur C. Vogley, Missouri City; Anthony M. Balistreri, Houston; Karl M. Guttag, Missouri City; Steven D. Krueger, Houston; Duy-Loan T. Le; Joseph H. Neal, both of Sugarland; Kenneth A. Poteet, Houston; Joseph P. Hartigan, Stafford, and Roger D. Norwood, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 184,749, Jan. 21, 1994, Pat. No. 5,390,149, which is a continuation of Ser. No. 690,207, Apr. 23, 1991.

This application Oct. 21, 1994, Ser. No. 327,540

Int. Cl.[6] **G11C** *13/00*

U.S. Cl. 365—221 **53 Claims**



1. A data processing system comprising

a digital processor;

a system clock circuit for producing a system clock signal having timing edges for controlling operation of the digital processor;

a synchronous random access memory, directly responsive to the edges of the system clock signal, for accessing addressable storage cells within the synchronous memory to write data into the storage cells and to read out data from the storage cells; and

the synchronous random access memory including input and output data latches arranged for latching data directly in response to the system clock signal.

5,587,955

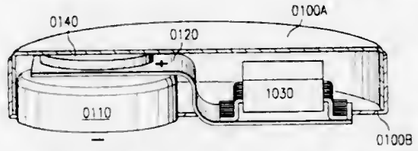
ELECTRONIC TOKEN

Robert D. Lee, Denton; Stephen M. Curry, Dallas; Michael L. Bolan, Dallas; Hal Kurkowski, Dallas; Donald R. Diaz, Carrollton; Francis A. Scherpenberg, Dallas, all of Tex., and Kevin E. Deierling, Los Altos Hills, Calif., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Division of Ser. No. 19,932, Feb. 19, 1993, Pat. No. 5,398,321, which is a division of Ser. No. 352,581, May 15, 1989, Pat. No. 5,210,846. This application Dec. 13, 1994, Ser. No. 355,362

Int. Cl.[6] **G06K** *19/04;19/06;* **H01L** *25/04;* **G11C** *7/00*

U.S. Cl. 365—221 **81 Claims**



1. An electronic token, comprising:

(a) a casing having a first conductive surface and a second conductive surface, said first conductive surface and said second conductive surface accessible from an exterior of said casing, said first conductive surface and said second conductive surface combine a substantial portion of said casing, said first conductive surface and said second conductive surface combine to form a cavity;

(b) an energy source positioned in said cavity;

(c) a semiconductor memory positioned in said cavity, said semiconductor memory electrically coupled to said energy source;

(d) input logic operatively electrically coupled to said first conductive surface and to said second conductive surface of said casing and configured to detect whether said first conductive surface is at a first voltage or at a second voltage and selectably to store data in said semiconductor memory accordingly, said input logic electrically coupled to said energy source; and

(e) output logic comprising an active device electrically coupled to selectably pull said first conductive surface of said casing toward said second voltage, said output logic electrically coupled to said semiconductor memory and said energy source.

5,587,956

SEMICONDUCTOR MEMORY DEVICE HAVING FUNCTION OF GENERATING BOOSTED POTENTIAL

Susumu Tanida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,077

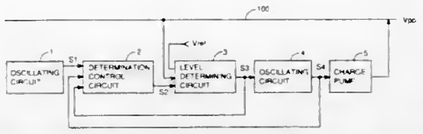
Claims priority, application Japan, Nov. 10, 1994, 6-276476

Int. Cl.[6] **G11C** *13/00;8/00*

U.S. Cl. 365—226 **6 Claims**

1. A semiconductor memory device comprising:

a boosted potential node provided for outputting a boosted potential;



determination cycle control means for outputting a control pulse signal having a controllable cycle for defining a cycle used for determining a level of the potential of said boosted potential node;

level determining means for comparing the potential of said boosted potential node with a predetermined reference potential to determine a relative level of the potential of said boosted potential node with respect to the reference potential in accordance with a determination cycle defined by said control pulse signal output from said determination cycle control means;

drive pulse oscillating means for oscillating a drive pulse signal when said level determining means determines that the potential of said boosted potential node is lower than said reference potential; and

charge pump means for being driven to supply an electric charge for raising the potential of said boosted potential node to said boosted potential node in response to the drive pulse signal output from said drive pulse oscillating means, wherein

said determination cycle control means outputs a control pulse signal of a first cycle in response to the determination by said level determining means that the potential of said boosted potential node is equal to or higher than said reference potential, and outputs the control pulse signal of a second cycle shorter than said first cycle in response to the determination by said level determining means that the potential of said boosted potential node is lower than said reference potential.

5,587,957

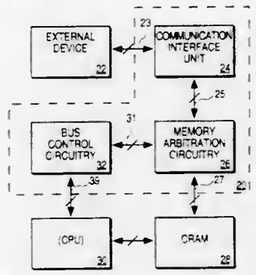
CIRCUIT FOR SHARING A MEMORY OF A MICROCONTROLLER WITH AN EXTERNAL DEVICE

Robert M. Kowalczyk; Robert H. Brown, III, both of Chandler, and Jack W. Heller, Mesa, all of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1995, Ser. No. 537,109

Int. Cl.[6] **G11C** *8/00;* **G06F** *9/00*

U.S. Cl. 365—230.03 **5 Claims**



1. A device for sharing a memory of a microcontroller with an external device said microcontroller having a CPU, said device, comprising:

a communication unit for exchanging information between said external device and said memory;

bus control circuitry for exchanging information, between said CPU of said microcontroller and said memory, and for generating CPU status signals;

memory arbitration circuitry, coupled to said communication unit and to said bus control circuitry, for receiving said CPU status signals and responsive thereto operatively coupling said communication unit to said memory when said CPU status

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signals indicate that said CPU will not access said memory for a predetermined time.

5,587,958

SEMICONDUCTOR MEMORY DEVICE INCLUDING A BOOST POTENTIAL GENERATION CIRCUIT

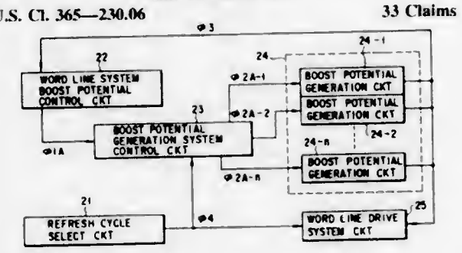
Tetsuya Kaneko, Kawasaki, and Takashi Ohsawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1994, Ser. No. 363,825

Claims priority, application Japan, Dec. 28, 1993, 5-349524

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.06 **33 Claims**



1. A semiconductor memory device comprising:

boosted potential generating means for steadily generating a boosted potential which is higher than an external voltage supplied thereto;

word line driving means, receiving the boosted potential of said boosted potential generating means as a power supply, for driving word lines; and

control means for receiving a designation signal for designating one of a plurality of refresh cycles and for supplying, to said boosted potential generating means, a control signal, which is generated based on the designation signal, for setting a current supply capability of said boosted potential generating means in accordance with the number of word lines driven by said word line driving means in the designated refresh cycle,

wherein the control signal generated by said control means increases the current supply capability of said boosted potential generating means when the number of word lines driven in the refresh cycle designated by the designation signal is increased, and decreases the current supply capability of said boosted potential generating means when the number of word lines driven in the refresh cycle designated by the designation signal is decreased.

5,587,959

SEMICONDUCTOR MEMORY DEVICE

Masaki Tsukude, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1995, Ser. No. 530,583

Claims priority, application Japan, Jan. 10, 1995, 7-001920

Int. Cl.[6] G11C *8/00*

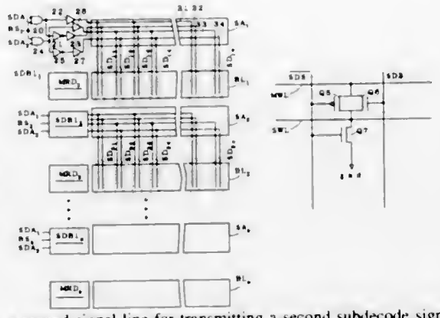
U.S. Cl. 365—230.06 **16 Claims**

15. A semiconductor memory device, comprising:

a plurality of memory elements provided in a plurality of rows and a plurality of columns for dynamically storing information by storing charge;

a main word line supplied with one of a first voltage not to make a selection of a set of rows in which said plurality of memory elements are provided and a second voltage higher than said first voltage to make the selection;

a first signal line for transmitting a binary first subdecode signal including said first voltage and a third voltage lower than said second voltage;



a second signal line for transmitting a second subdecode signal having a logical value complementary to said first subdecode signal;

a sub word line for selecting a certain row in said set of rows in accordance with an active state of said main word line and said first and second subdecode signals;

a first MOS transistor of P-channel having a first current electrode connected to said main word line, a control electrode connected to said second signal line and a second current electrode connected to said sub word line;

a second MOS transistor of N-channel having a first current electrode connected to said main word line, a control electrode connected to said first signal line and a second current electrode connected to said sub word line; and

a third MOS transistor of N-channel having a first current electrode connected to said sub word line, a control electrode connected to said second signal line and a second current electrode connected to said first voltage.

5,587,960

INTEGRATED CIRCUIT MEMORY DEVISE WITH VOLTAGE BOOST

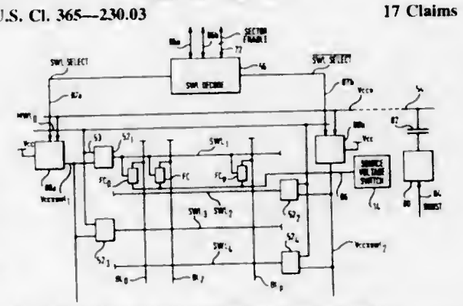
Andrew Ferris, Milan, Italy, assignor to SGS-Thomson Microelectronics Limited, Bristol, United Kingdom

Filed Nov. 15, 1995, Ser. No. 558,323

Claims priority, application United Kingdom, Nov. 15, 1994, 9423038

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.03 **17 Claims**



1. An integrated circuit memory device comprising:

a memory array comprising a plurality of memory cells arranged in rows and columns, the cells in a row being arranged in sectors with cells in each sector being connected to a common respective sub-wordline and cells in a column being connected to a common bit line;

a plurality of sub-wordline drive circuits associated respectively with said sub-wordlines and connected to supply a cell voltage to their associated sub-wordline;

voltage raising circuitry for raising a power supply voltage connected on a memory voltage supply line to said cell voltage;

row addressing circuitry for selecting one of the sub-wordlines in one of said sectors; and

control circuitry for selectively disconnecting at least some of said sub-wordline drive circuits associated with non-selected sub-wordlines from said memory voltage supply line.

5,587,961

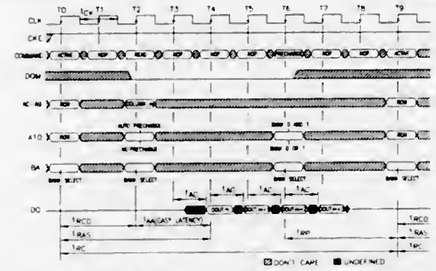
SYNCHRONOUS MEMORY ALLOWING EARLY READ COMMAND IN WRITE TO READ TRANSITIONS

Jeffrey P. Wright, and Hua Zheng, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 16, 1996, Ser. No. 601,290

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233 **15 Claims**



1. A memory device responsive to command signals and operating in synchronization with active edges of a system clock, the memory device comprising:

a memory array having storage cells; and

a command decoder/controller responsive to selected command signals to initiate, at a first active edge of the system clock, a burst write command controlling a burst write operation to transfer multiple input data sets to the memory array and to initiate, at a second active edge of the system clock, a read command controlling a read operation to transfer at least one output data set from the memory array, wherein one of the multiple input data sets transferred during the write operation is input into the memory device during a second system clock cycle beginning with the second active edge, and wherein each input and output data set includes at least one bit of data.

5,587,962

MEMORY CIRCUIT ACCOMMODATING BOTH SERIAL AND RANDOM ACCESS INCLUDING AN ALTERNATE ADDRESS BUFFER REGISTER

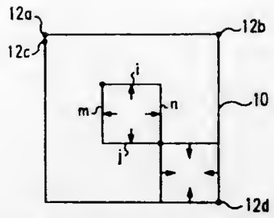
Masashi Hashimoto, Garland; Gene A. Frantz, Missouri City, both of Tex.; John V. Moravec, Willow Springs, Ill., and Jean-Pierre Dolait, Villeneuve-Loubet, France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 362,289, Dec. 22, 1994, which is a division of Ser. No. 175,478, Dec. 22, 1993, Pat. No. 5,400,288, which is a continuation of Ser. No. 843,780, Feb. 28, 1992, abandoned, which is a division of Ser. No. 512,611, Apr. 20, 1990, Pat. No. 5,093,807, which is a continuation of Ser. No. 137,305, Dec. 23, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 483,003

Int. Cl.[6] G11C *8/04*

U.S. Cl. 365—230.09 **13 Claims**

1. A memory circuit for storing and providing streams of data, said memory circuit accommodating both serial access and random access, said memory circuit comprising:



a random access memory array having an address input and a data port;

a data buffer having a data port coupled to said memory array data port, said data buffer synchronizing operation of said memory array to the streams of data;

an address sequencer having a data input and having an output coupled to said memory array address input, said address sequencer generating a sequence of memory addresses to be successively applied to said memory array;

an address buffer register having an output coupled to said address sequencer data input, said address buffer register supplying a random access address that initializes the sequence of memory addresses generated by said address sequencer; and

an alternate address buffer register having an output coupled to said address sequencer data input, said alternate address buffer register supplying an alternate random access address that initializes an alternate sequence of memory addresses generated by said address sequencer.

5,587,963

SEMICONDUCTOR MEMORY DEVICE

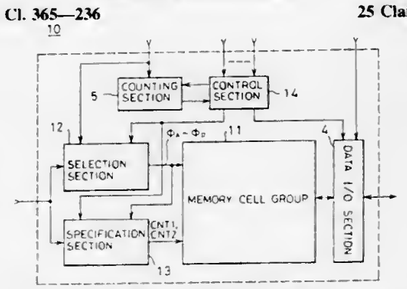
Haruki Toda; Shozo Saito, and Kaoru Tokushige, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 223,222, Apr. 5, 1994, Pat. No. 5,500,824, which is a division of Ser. No. 775,602, Oct. 15, 1991, Pat. No. 5,313,437. This application Apr. 24, 1995, Ser. No. 427,270

Claims priority, application Japan, Oct. 15, 1990, 2-273170; Oct. 2, 1991, 3-255354

Int. Cl.[6] G11C *7/00;14/00*

U.S. Cl. 365—236 **25 Claims**



1. A semiconductor memory device, comprising:

a memory cell array having a plurality of memory cells arranged in rows and columns, said memory cells storing data and being selected according to address signals; and

control means, receiving a clock signal and a first control signal, for outputting a plurality of said data in synchronism with said clock signal after said first control signal is asserted, output of said data beginning a number of clock cycles (N) of said clock signal (N being a positive integer ≧2) after said first

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control signal is asserted, a different one of said data being output at each of said clock cycles after said output begins until said plurality of data is output.

5,587,964

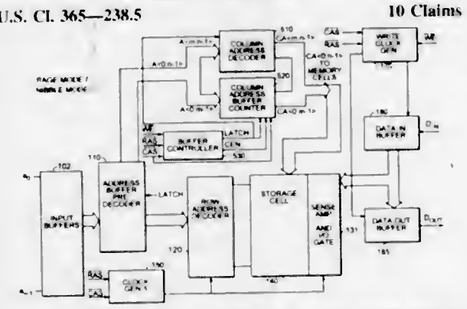
PAGE MODE AND NIBBLE MODE DRAM

Mitchell N. Rosich, Groton, Mass., and William L. Lippitt, Cumbuland, R.I., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 417,712, Apr. 6, 1995, abandoned, which is a continuation of Ser. No. 317,413, Oct. 3, 1994, abandoned, which is a continuation of Ser. No. 176,294, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 722,697, Jun. 28, 1991, abandoned. This application Apr. 1, 1996, Ser. No. 625,990

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—238.5 **10 Claims**



1. A page mode/nibble mode dynamic random access memory (DRAM) for providing both a page mode and a nibble mode comprising:

a storage cell for storing information in an array defined by a predetermined number of rows and columns;

a row address decoder, coupled to said storage cell, the row address decoder receiving a first predetermined portion of a memory address and a first signal, said row address decoder inputting the first predetermined portion of the memory address into said storage cell in response to receiving the first signal;

a column address decoder, coupled to said storage cell, for receiving a second predetermined portion of the memory address and a second signal;

a column address buffer counter, coupled to the column address decoder and said storage cell, the column address buffer counter for receiving a third predetermined portion of the memory address and the second signal;

said column address decoder and said column address buffer counter inputting the second and third predetermined portions, respectively, of the memory address into said storage cell in response to receiving the second signal;

data-in and data-out buffers each coupled to said storage cell;

a write mode/read mode selection means coupled to said data-in and data-out buffers for receiving as an input a third signal with a state of the third signal determining whether a write mode is selected and whether a read mode is selected; and

a buffer controller means, coupled to said column address decoder and said column address buffer counter, the buffer controller means for receiving at least the third signal as an input and for providing the second signal, with a state of the third signal determining whether a page mode or a nibble mode is selected, and wherein said page mode or said nibble mode is changeable during operation of said dynamic random access memory.

5,587,965

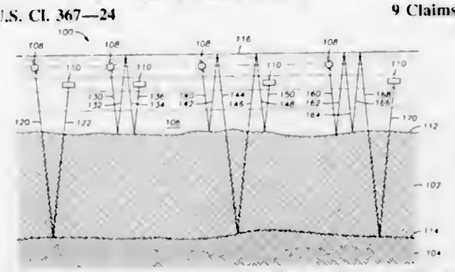
SURFACE MULTIPLE ATTENUATION VIA EIGENVALUE DECOMPOSITION

William H. Dragoset, Jr., and Zeljko Jericevic, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Apr. 26, 1996, Ser. No. 638,282

Int. Cl.[6] G01V *1/38;1/36*

U.S. Cl. 367—24 **9 Claims**



1. A method for substantially attenuating surface multiples from a marine seismic signal, comprising the steps of:

transforming said marine seismic signal from time domain into frequency domain to generate a transformed signal represented by matrix D, truncating said marine seismic signal in time to generate a truncated signal and transforming said truncated signal from time domain into frequency domain to generate a transformed truncated signal represented by truncated matrix D_T;

computing eigenvalue decomposition $D_T=S\cdot A\cdot S^{-1}$ of said truncated matrix D_T; where A is the diagonal matrix whose elements are the eigenvalues of D_T, S is the square matrix whose rows are the corresponding eigenvectors of D_T and S^{-1} is the inverse of S,

solving for source wavelet w by minimizing total energy in matrix product $[D\cdot S][I-w^{-1}A]^{-1}S^{-1}$ in an iterative loop;

solving for primary matrix P by inserting said solved value for said source wavelet w into the expression

$$P=[D\cdot S][I-w^{-1}A]^{-1}S^{-1};\text{ and}$$

inverse transforming said primary matrix P from frequency domain into time domain.

5,587,966

SONIC WELL LOGGING METHODS AND APPARATUS FOR PROCESSING FLEXURAL WAVE IN OPTIMAL FREQUENCY BAND

Christopher V. Kimball, West Redding, Conn., and David J. Scheibner, Tokyo, Japan, assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Oct. 13, 1994, Ser. No. 322,885

Int. Cl.[6] G01V *1/40;* **G06F** *15/48*

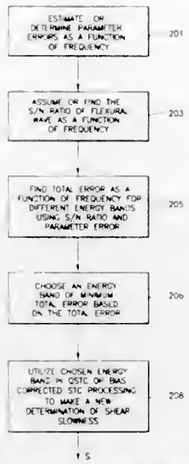
U.S. Cl. 367—31 **21 Claims**

1. A method of determining a frequency band for the frequency-dependent processing of flexural wave information obtained in a borehole traversing a formation, comprising:

a) obtaining a determination of a diameter of the borehole;

b) obtaining a preliminary estimate of a shear slowness of the formation;

c) choosing a frequency band with a center frequency which is a function of said preliminary estimate of a shear slowness of the formation, and a function of the product of said estimate shear slowness and said borehole diameter, said frequency band having a bandwidth less than twice said center frequency; and



d) processing the flexural wave information in said frequency band to obtain an indication of a parameter of the formation.

5,587,967

METHOD FOR IMPROVEMENT OF SEISMIC SECTIONS

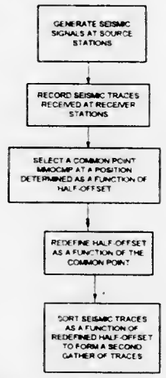
Ralf G. Ferber, Hanover, Germany, assignor to Prakla-Seismos GmbH, Hanover, Germany

Continuation of Ser. No. 182,006, Jan. 13, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,923

Claims priority, application European Pat. Off., May 15, 1992, 92108259; May 29, 1992, 92109082

Int. Cl.[6] G01V *1/36;1/24*

U.S. Cl. 367—53 **8 Claims**



1. A method for improving seismic sections comprising the steps of

generating seismic signals at a plurality of source stations;

recording seismic traces at a plurality of receiver stations;

selecting a common point (MMOCMP) having a position defined by

$$l^2=h^2-b^2+r^2$$

wherein

h is a half-offset between a source station and a receiver station and defines RAWCMP,

b is a distance between RAWCMP and a point on a line joining said source station and receiver station corrected by dip moveout, thereby defining DMOCMP,

r is a distance between DMOCMP and MMOCMP, and

l is a distance between the selected common point MMOCMP and the RAWCMP;

gathering the recorded seismic traces as a first gather at said common point;

redefining half-offset l as a function of the common point; and

sorting the seismic traces as a function of the redefined half-offset l, thereby forming a second gather of traces.

5,587,968

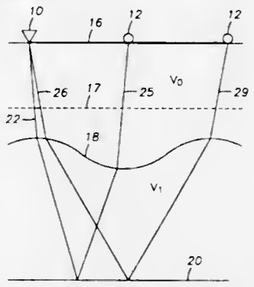
METHOD FOR MEASURING THE NEAR-SURFACE SHEAR WAVE VELOCITY FOR USE IN DETERMINING 3-COMPONENT 3-D STATICS

Frederick J. Barr, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Aug. 25, 1995, Ser. No. 519,463

Int. Cl.[6] G01V *1/36*

U.S. Cl. 367—75 **6 Claims**



1. A method for scaling static time corrections for application to shear wave reflection data received by at least two sets of two co-located shear wave sensors having first and second mutually perpendicular polarization directions respectively, the sets being distributed in spaced-apart relationship along a line of survey, comprising:

a) acoustically irradiating a first microspread including a plurality of spaced-apart seismic sensors, the microspread being aligned along a first azimuth aligned with said first polarization direction;

b) determining the phase velocity of a compressional wave, propagating directly through a near-surface earth layer, from measurement of the arrival times of the compressional wave detected by each said sensor as a function of sensor spacing;

c) determining the group velocity of a boundary wave, propagating along the upper boundary of said near-surface earth layer, from the arrival time of the boundary wave detected by each said sensor as a function of sensor spacing;

d) resolving the so-determined velocities to define a first near-surface shear-wave velocity vector directed along said first azimuth;

e) repeating steps a) through d) for a microspread oriented along a second azimuth aligned with said second polarization direction, to define a second near-surface shear-wave velocity vector directed along said second azimuth;

f) defining a scaling coefficient from the ratio between said first and second near-surface shear wave velocity vectors;

g) applying said scaling coefficient to static time corrections applicable to seismic recordings received by shear-wave sensors whose polarization directions are aligned with said second azimuth.

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5,587,969

PROCESS FOR THE RECOGNITION AND SEPARATION OF USEFUL AND INTERFERING ECHOES IN THE RECEIVED SIGNALS OF DISTANCE SENSORS WHICH OPERATE IN ACCORDANCE WITH THE PULSE-ECHO PRINCIPLE

Nils Kroemer, Hohenstein-Ernstthal; Martin Vossiek, München; Peter-Christian Eccardt, Ottobrunn, and Valentin Magori, München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

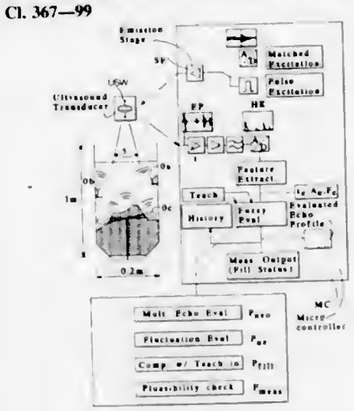
PCT No. PCT/DE94/00249, § 371 Date Sep. 5, 1995, § 102(e) Date Sep. 5, 1995, PCT Pub. No. WO94/22033, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 10, 1994, Ser. No. 522,310

Claims priority, application Germany, Mar. 16, 1993, 43 08 373.0

Int. Cl.[6] **G01S** *15/00;7/52;* **G01F** *23/28*

U.S. Cl. 367—99 **7 Claims**



1. A method for the recognition and separation of useful and interfering echoes in a received signal of a pulse-echo distance sensor, said method comprising the steps of:

detecting maxima in said received signal and associating each maxima with an echo;

identifying a form factor with each echo characterizing a form of that echo, and storing the form factors for the respective echoes;

identifying an amplitude and a time of occurrence for each maximum, and storing the respective amplitude and time of occurrence for all of said maxima;

measuring a difference between the amplitudes of the respective maxima and expected amplitude values;

measuring a difference between the time of occurrence of each maximum and expected time of occurrence values;

measuring a difference between the form factor for each echo and expected form factor values;

assigning a probability to each echo as to whether that echo comprises a multiple echo by evaluating each of the amplitude, time of occurrence and form factor differences with a smaller difference resulting in an increased probability that said echo comprises a multiple echo; and

assigning a probability to each echo as to whether that echo comprises an interfering echo with the probability that said echo comprises an interfering echo being greater as the probability of said echo comprising a multiple echo increases.

5,587,970

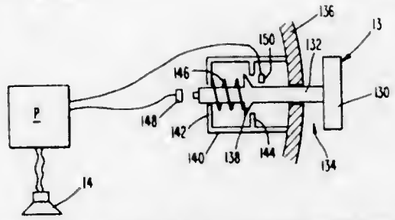
PERSONAL ATTACK/HELP ALARM

Julie A. Greenwood, 33 Russell Dr., Wollaton, Nottingham NG8 2BA, United Kingdom

Filed Nov. 29, 1994, Ser. No. 346,418

Int. Cl.[6] **G04B** *47/00;* **G08B** *15/00;13/00*

U.S. Cl. 368—10 **8 Claims**



1. A personal attack/help alarm incorporated within a watch to be worn by an operator, the alarm comprising an alarm signal generating device and activating means accessible externally to enable the alarm to be activated by the operator, and in which the activating means is a pin switch arrangement, in which the pin switch arrangement comprises a two position device, a first position for testing the alarm and a second position for full activation of the alarm, and in which the second position the pin is completely removed from the watch.

5,587,971

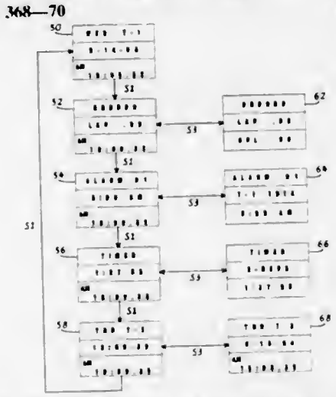
MODE PRESELECT FUNCTION FOR A MULTIMODE ELECTRONIC TIMEPIECE

Tom Thinesen, Sunnyvale, Calif., assignor to Timex Corporation, Middlebury, Conn.

Filed Feb. 20, 1996, Ser. No. 603,972

Int. Cl.[6] **G04B** *19/30;* **G04C** *19/00*

U.S. Cl. 368—70 **8 Claims**



1. An improved multimode electronic timepiece of the type having a display, a plurality of manually actuated switches, and an integrated circuit programmed to keep time, to provide a set of at least three operating modes, including time-of-day, in a continuous loop, and to permit an operator of the timepiece to shift said operating modes sequentially by selectively and repetitively actuating a first of said switches, wherein the improvement comprises:

mode preselect function means responsive to selective actuation of a second of said switches, said mode preselect function means comprising a program for the integrated circuit which provides a set of at least one preselect function mode in a continuous loop, each preselect function mode displaying information from a preselected operating mode along with information from another operating mode;

said program being adapted to permit the operator of the timepiece to shift sequentially through the set of preselect function modes by selectively, and where there is more than one preselect function mode in the set, repetitively actuating a third of said switches; and

said mode preselect function means being further responsive to selective actuation of a fourth of said switches, actuation of said fourth switch causing the timepiece to shift between a preselect function mode and the operating mode, other than the preselected operating mode, having its information displayed by said preselect function mode.

5,587,972

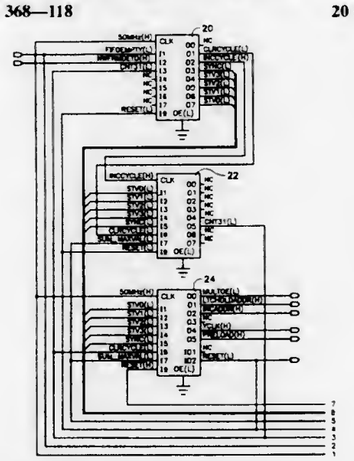
CONTROL CIRCUIT USING DELAY LINES TO GENERATE CLOCK AND CONTROL SIGNALS DURING A CLOCK CYCLE OF THE SYSTEM CLOCK

Ronald D. Schofield, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1996, Ser. No. 610,502

Int. Cl.[6] **G04F** *8/00;* **G06F** *1/04*

U.S. Cl. 368—118 **20 Claims**



1. A control signal generating circuit comprising:

state machine means for receiving a system clock signal, said state machine means, responsive to said system clock signal, generating a plurality of state variable signals;

a plurality of decoding means coupled to said state machine means, each of said decoding means receiving said plurality of state variable signals, each of said decoding means decoding said plurality of state variable signals to provide a group of timing and control signals;

first delay means coupled to three of said plurality of decoding means, said first delay means receiving and then delaying for a first predetermined time period some of said group of timing and control signals from each of said three decoding means coupled to said first delay means; and

second delay means coupled to two of said plurality of decoding means, said second delay means receiving and then delaying for a second predetermined time period at least one of said timing and control signals from each of said two decoding means coupled to said second delay means.

5,587,973

MAGNETO-OPTICAL DISK DRIVE SYSTEM WITH MAGNETIC HEAD RETRACTING MECHANISM AND MANUAL CARTRIDGE EJECTING MECHANISM

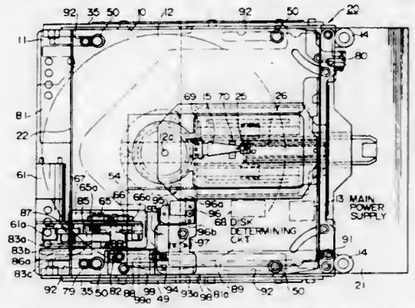
Hiroshi Kanazawa; Isao Okuda; Shimpei Shinozaki, and Suguru Takishima, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 86,432, Jul. 6, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 408,977

Claims priority, application Japan, Jul. 7, 1992, 4-179922; Nov. 16, 1992, 4-78734

Int. Cl.[6] **G11B** *11/00;33/02*

U.S. Cl. 369—13 **6 Claims**



1. A magneto-optical disk drive system utilizing a magnetic field modulation recording method, comprising:

a housing;

a disk cartridge for housing a magneto-optical disk therein, said disk cartridge being insertable into said housing;

a magnetic head for writing information on the magneto-optical disk held in said disk cartridge, said magnetic head being movably disposed in said housing;

cam means supported on said housing for guiding said disk cartridge to move between a first unloading position and a first loading position when said disk cartridge is inserted in said housing, and guiding said magnetic head to move between a second unloading position from said disk cartridge toward a second loading position close to said disk cartridge;

resilient means acting between said housing and said cam means normally urging said magnetic head to move from said second loading position to a standby position between said first loading position and said second unloading position;

electromagnetic locking means energizable for holding said cam means to lock said magnetic head in said second loading position against a bias of said resilient means, and de-energizable for releasing said cam means to move said magnetic head from said second loading position into said standby position under the bias of said resilient means;

a lock arm for engaging said cam means to prevent said magnetic head from moving from said standby position toward said second unloading position when said electromagnetic locking means is de-energized;

a manual ejecting lever slidably supported in said housing and manually pressable for moving said lock arm out of engagement with said cam means and moving said cam means to guide said disk cartridge to move from said first loading position to said first unloading position;

a guide plate assembly movably supported on said housing;

a magnetic head carriage supporting said magnetic head;

a cartridge holder for holding said disk cartridge, and wherein

said cam means includes a first cam pin mounted on said cartridge holder and movably disposed in a first cam groove defined in said guide plate assembly, and a second cam pin

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mounted on said magnetic head carriage and movably disposed in a second cam groove defined in said guide plate assembly;

said manual ejecting lever being slidably mounted on said guide plate assembly;

an attachment plate;

a drive motor supported on said housing by said attachment plate;

a drive gear rotatably supported on said attachment plate and operatively coupled to said drive motor and said guide plate assembly for causing said cam means to move said cartridge holder and said magnetic head carriage; and wherein

said lock arm is angularly movably supported on said attachment plate for lockingly engaging said drive gear to prevent said magnetic head from moving from said standby position toward said second unloading position when said electromagnetic locking means is de-energized.

5,587,974

MAGNETO-OPTICAL RECORDING MEDIUM HAVING TWO MAGNETIC LAYERS WITH PERPENDICULAR MAGNETIC ANISOTROPY, AND INFORMATION RECORDING METHOD HAVING THE SAME

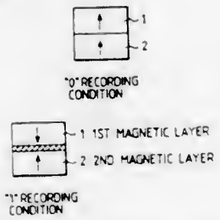
Naoki Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 171,628, Dec. 22, 1993, abandoned. This application Aug. 23, 1995, Ser. No. 518,220

Claims priority, application Japan, Dec. 28, 1992, 4-347871

Int. Cl.[6] G11B *5/02; 11/00*

U.S. Cl. 369—13 **4 Claims**



1. An information recording method for recording information on a magneto-optical recording medium that includes a first magnetic layer having a perpendicular magnetic anisotropy, and a second magnetic layer having a perpendicular magnetic anisotropy and in which a direction of magnetization remains constantly aligned in one direction at all times, said method comprising the steps of:

radiating a laser beam, which is not modulated in accordance with the information to be recorded, onto the recording medium; and

while the laser beam is being irradiated onto the recording medium, selectively performing, in accordance with the information to be recorded, one of (i) a first type of recording step of applying an external magnetic field to align a direction of magnetization of the first magnetic layer in a direction of the external magnetic field, and (ii) a second type of recording step of removing the external magnetic field, the laser beam irradiation being effective to align the direction of magnetization of the first magnetic layer in a direction that is stable with respect to the direction of magnetization of the second magnetic layer.

5,587,975

MAGNETO-OPTICAL DISK REPRODUCING APPARATUS WITH GAIN AND OFFSET CONTROLLED BY A REFERENCE PATTERN READ FROM THE DISK

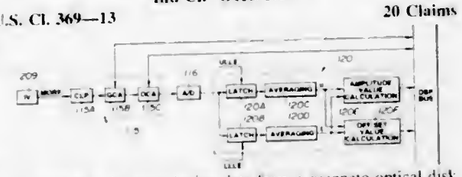
Shoei Kobayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 20, 1995, Ser. No. 545,957

Claims priority, application Japan, Oct. 24, 1994, 6-258283

Int. Cl.[6] G11B *5/09*

U.S. Cl. 369—13 **20 Claims**



1. Apparatus for reproducing data from a magneto-optical disk, said data being recorded in a track which contains a reference pattern exhibiting distinct amplitude levels, said apparatus comprising:

an optical head for reading data in said track;

gain control means supplied with a signal read by said optical head and having an adjustable gain to vary the gain of said signal;

offset control means supplied with a gain-controlled signal from said gain control means and adjustable to vary the offset of said gain-controlled signal;

level detecting means for detecting upper and lower amplitude levels in the reference pattern read by said optical head; and

calculating means responsive to said upper and lower amplitude levels to calculate amplitude and offset control values for adjusting the gain and offset of said gain control and offset control means, respectively, whereby data read by said optical head is reproduced with predetermined gain and offset.

5,587,976

OPTICAL PICKUP FOR OPTICAL MAGNETIC DISC

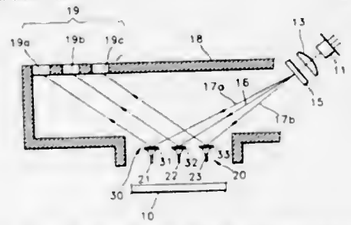
Jang-hoon Yoo, Seoul; Kyung-hwa Rim; Chong-sam Chung, both of Suwon, and Chul-woo Lee, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 13, 1995, Ser. No. 555,967

Claims priority, application Rep. of Korea, Dec. 29, 1994, 94-39004

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—13 **10 Claims**



1. An optical pickup for reproducing information stored in an optical magnetic disc, said optical pickup comprising:

a light source;

a grating for diffracting the light radiated from said light source into a main light beam and at least two auxiliary light beams;

a plurality of magnetic dipole tips arranged above said optical magnetic disc so as to interact with magnetic signals stored in said optical magnetic disc;

a plurality of mirror members being each attached to a rear end of each of said plurality of magnetic dipole tips for reflecting said main light beam and at least two auxiliary light beams; and

a plurality of photodetectors for receiving the reflected light beams from said plurality of mirror members.

5,587,977

RECORDING/REPRODUCING APPARATUS HAVING MEANS TO DETECT THE EXCHANGE OF AN EXTERNAL MEMORY

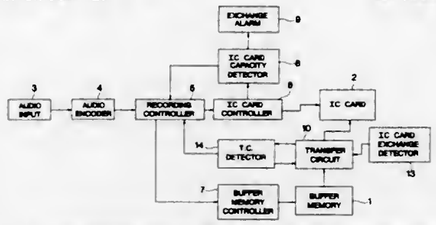
Yasumoto Murata, Nara-ken, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 207,597, Mar. 9, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,270

Claims priority, application Japan, Mar. 17, 1993, 5-057543

Int. Cl.[6] G11B *19/00*

U.S. Cl. 369—25 **20 Claims**



1. A recording/reproducing apparatus for recording and reproducing an audio signal, comprising:

an audio encoding means for receiving an audio signal and converting the audio signal into audio data;

an external memory means for storing the audio data, the external memory means being mounted in and dismounted from the apparatus at will;

an internal memory means for temporarily storing the audio data, the internal memory means being built in the apparatus;

a memory control means for controlling writing and reading operations of the audio data;

a detection means for detecting the exchange of the external memory means, the detection means producing an output signal when the external memory means is exchanged into another external memory means; and

an audio data transfer means for, in response to the output signal from the detection means, transferring the audio data stored in the internal memory means into said other external memory means,

wherein the detection means further comprises a storage capacity detection means for detecting that the rest of the storage capacity in the external memory means becomes less than a prescribed level and then outputting a first detection signal indicating that the rest of the storage capacity in the external memory means has become less than the prescribed level.

5,587,978

RECORD/REPRODUCTION APPARATUS FOR RECORDING/REPRODUCING MULTI-CHANNEL SIGNALS IN DIFFERENT AREAS OF A RECORDING MEDIUM

Kazuhito Endo; Masayuki Ishida; Yoshinobu Ishida; Manabu Tsukamoto, and Nobuaki Hirai, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

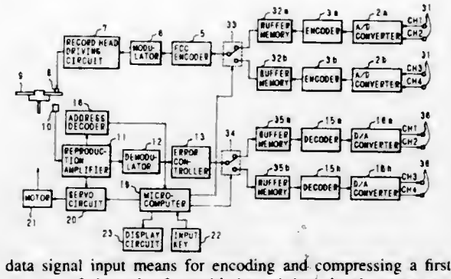
Filed Apr. 15, 1993, Ser. No. 46,143

Claims priority, application Japan, Apr. 16, 1992, 4-096216; Apr. 17, 1992, 4-097629; May 6, 1992, 4-113596

Int. Cl.[6] G11B *17/22*

U.S. Cl. 369—32 **8 Claims**

4. A recording/reproduction apparatus for recording data signals having a compressed data amount and for recording signals having continuous addresses on a recording medium and reproducing the data signals, comprising:



data signal input means for encoding and compressing a first group of channels of a multi-channel data signal, output as a first data signal, said first group of channels being represented by a continuous input signal;

recording means for recording the first data signal on the recording medium;

reproducing means for reproducing a second data signal from the recording medium;

recording/reproduction control means for recording a first portion of the first data signal into a first area of the recording medium, for reproducing a first portion of the second data signal from a second area of the recording medium, for recording a second portion of the first data signal, following an end address of said first portion of the first data signal, into the first area of the recording medium, and for reproducing a second portion of the second data signal from the second data area, thereby alternately recording the first data signal and reproducing the second data signal; and

data signal output means for expanding and decoding at least the first and second portions of the second data signal to produce a continuous output signal representing a second group of channels of the multi-channel data signal.

5,587,979

INFORMATION CARRIER HAVING INFORMATION PACKETS CONTAINING CODED TEXT OR IMAGE INFORMATION RELATING TO DIFFERENT CATEGORIES, ARRANGEMENT FOR READING SUCH INFORMATION CARRIER AND A SYSTEM INCLUDING SUCH ARRANGEMENT AND INFORMATION CARRIER

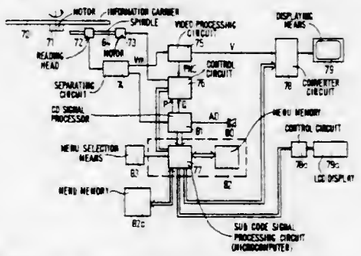
Björn Blüthgen, Celle, Germany, assignor to U.S. Philips Corporation, and Dupont Optical Company, both of Nieuwegein, Netherlands

Continuation of Ser. No. 741,230, Aug. 5, 1991, abandoned, which is a continuation of Ser. No. 297,800, Jan. 17, 1989, abandoned. This application Apr. 5, 1993, Ser. No. 300,002

Claims priority, application Germany, Jan. 19, 1988, 38 01 332.0; May 18, 1988, 38 16 832.4

Int. Cl.[6] G11B *7/085*

U.S. Cl. 369—32 **82 Claims**



1. A system for transferring information, comprising:

an information carrier having main information and sub-information, the sub-information including a plurality of information packets which each contains coded text or image information therein relating to an information category and a

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category code which is separate from and indicates the information category to which the information contained therein relates, different ones of the information packets containing coded text or image information relating to different information categories and being interleaved; and

an arrangement for reading the information carrier, including:

reading means for reading the sub-information;

selection means for selecting one of the information categories to which the information contained in the information packets relates as a selected information category; and

separating means for separating the one or more information packets containing coded text or image information relating to the selected information category from the sub-information on the basis of the category codes.

5,587,980

METHOD DERIVING A QUALITY SIGNAL FROM A READ SIGNAL, AND READING AND RECORDING DEVICES WHICH EMPLOY THAT METHOD

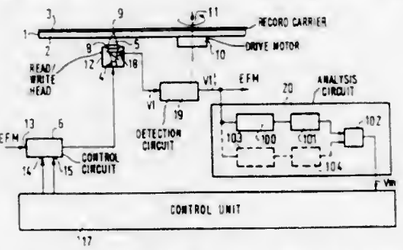
Johannes G. F. Kablau; Winslow M. Mimnagh, and Petrus C. J. Hoeven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1994, Ser. No. 219,321

Claims priority, application Belgium, Apr. 22, 1993, 09300398

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—54 **25 Claims**



1. A method of deriving a quality signal which is indicative of the quality of a read signal having constant-length bit cells, which bit cells individually have a first or a second logic value, the method comprising:

obtaining the read signal by reading an information pattern of optically detectable effects which represent groups of successive bit cells having the first logic value, in which first read signal portions of the read signal exceeding a reference value correspond to the effects; and

deriving the quality signal on the basis of the first read signal portions, such derivation involving determining a first measure of first length deviation between lengths of the first read signal portions which represent groups of n successive bit cells and n times the bit cell length, where n is a value such that sensitivity of the length deviation for the value of n to certain parameter changes is relatively large in comparison with sensitivity of the first length deviation for other values of n to the parameter changes.

5,587,981

MULTI-STANDARD OPTICAL DISK READING METHOD HAVING DISTINCTION PROCESS

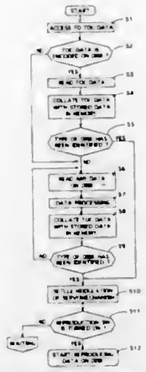
Yasuo Kamatani, 2-12-2 Yokoyama, Sagamihara-shi, Kanagawa 229, Japan

Filed Sep. 5, 1995, Ser. No. 523,461

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **3 Claims**

1. An optical disk reading method comprising the steps of.



reading a total of contents data in a read-in region of an optical disk to identify total number of data layers and pit configuration standard of the optical disk; and

settling modulation of servomechanism means dependent upon the total of contents data;

(a)the servomechanism means including:

a focusing lens servo to modulate position of a focusing lens; and

a tracking servo to modulate movement of a pickup.

5,587,982

OPTICAL DISK DRIVE DEVICE CAPABLE OF DETECTING MISPLACEMENT OF OPTICAL DISKS

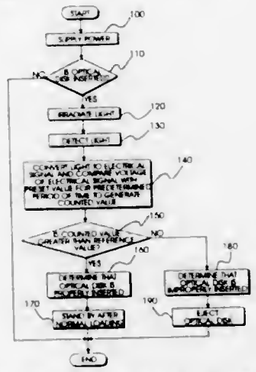
Tae-Young Choi, Uiwang, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 23, 1995, Ser. No. 547,070

Claims priority, application Rep. of Korea, May 12, 1995, 11766/1995

Int. Cl.[6] G11B *3/90;23/00*

U.S. Cl. 369—58 **15 Claims**



1. An optical disk driving apparatus for preventing misplacement of an optical disk within said optical disk driving apparatus, said optical disk driving apparatus comprising:

a main body having an opening through which said optical disk is transferred into and out from said optical disk driving apparatus;

transfer means for transferring said optical disk into and out from said main body;

driving means, positioned within said main body, for rotatably driving said optical disk when said optical disk is loaded upon said driving means;

an optical pickup for detecting information recorded on said optical disk while said optical disk is rotated by said driving means;

light emitting means for irradiating first light onto at least one surface of said optical disk while said optical disk is being inserted into said main body via said transfer means;

light receiving means, positioned apart from said light emitting means, for receiving second light reflected by said optical disk in response to said first light irradiated by said light emitting means; and

circuit means for determining whether said optical disk is being properly inserted into said main body in dependence upon an amount of said second light received by said light receiving means, said circuit means controlling said transfer means to eject said optical disk from said main body before said optical disk is loaded upon said driving means when said optical disk is not being properly inserted into said main body.

5,587,983

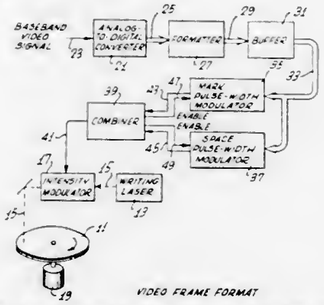
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to Discovision Associates, Irvine, Calif.

Continuation of Ser. No. 119,655, Sep. 13, 1993, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application Jun. 7, 1995, Ser. No. 473,737

Int. Cl.[6] H04N *5/76;5/78*

U.S. Cl. 369—59 **8 Claims**



1. A disc-shaped record medium for storing digital information in a succession of substantially circular and concentric recording tracks,

wherein each recording track includes a succession of alternating marks and spaces, lengths of successive marks and spaces being modulated in accordance with information to be recorded, the digital information derived from a succession of multi-bit binary code blocks, said digital information being converted to a succession of output pulses having discretely-variable time durations,

wherein each recording track includes lengths on which are recorded marks and spaces representing digital information to be recorded interspersed with lengths on which are recorded supermark synchronization patterns,

wherein the lengths of the succession of marks and spaces are modulated in discrete steps in accordance with the discrete lengths of the succession of said output pulses, and wherein said record medium includes information thereon which is indicative of a particular location of said information on the record medium.

5,587,984

HOLOGRAM PRINTED ON OPTICAL RECORDING MEDIUM FOR COPY PROTECTION

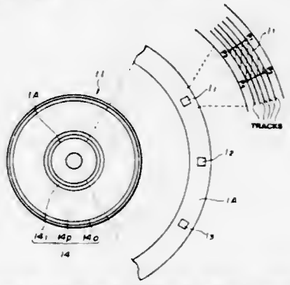
Hideo Owa, and Seiji Kobayashi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1995, Ser. No. 525,191

Claims priority, application Japan, Sep. 13, 1994, 6-218543

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—103 **17 Claims**



1. An optical recording medium having signals optically recorded therein, the optical recording medium comprising a hologram for recording medium discrimination recorded in an area other than an information recording area in which information signals are recorded.

5,587,985

SIGNAL PROCESSING DEVICE FOR AN OPTICAL INFORMATION REPRODUCING APPARATUS

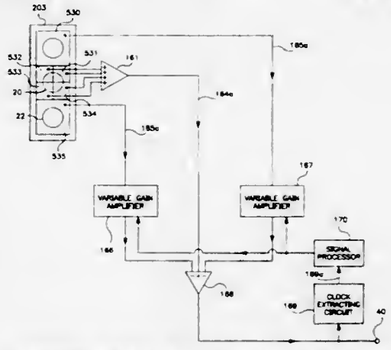
Kousei Sano, Neyagawa, and Shin-ichi Kadowaki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 207,859, Mar. 8, 1994. This application Sep. 25, 1995, Ser. No. 533,527

Claims priority, application Japan, Mar. 9, 1993, 5-47701; Mar. 10, 1993, 5-48917; Apr. 2, 1993, 5-76636

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—124 **29 Claims**



1. An apparatus capable of optically reproducing information from a recording medium, the apparatus comprising:

an optical pickup head for outputting a first signal mainly including information recorded at a desired position and a second signal including information recorded at positions

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adjacent to the desired position, when informations are to be reproduced by a light beam from the recording medium having tracks in which the informations are recorded;

an operation circuit for receiving the first and second signals and for performing an adding or subtracting operation;

a variable gain amplifier for controlling the level or polarity of the first or second signal which is input into the operation circuit; and

a signal processing means for receiving the first signal or a signal output from the operation circuit and for outputting a signal for adjusting a gain of the variable gain amplifier.

5,587,986

ON-TRACK DETECTING CIRCUIT FOR USE IN TRACKING SERVO APPARATUS

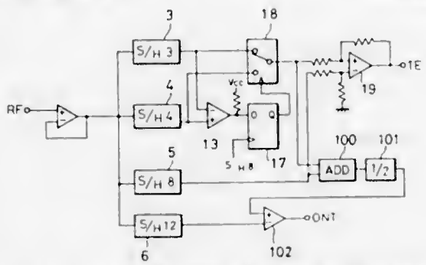
Kyota Funamoto, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 6, 1995, Ser. No. 540,402

Claims priority, application Japan, Oct. 14, 1994, 6-276140

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—124 **3 Claims**



1. An on-track detecting circuit in a tracking servo apparatus of an optical disk apparatus for recording or reproducing to/from a disk having wobble pits formed by deviating from a track center in the opposite directions for the disk radial direction by a predetermined track pitch and clock pits formed on the track center, comprising:

sample and hold circuits for sampling and holding outputs from at least the two wobble pits existing in a same servo byte;

an adding circuit for adding outputs of said sample and hold circuits;

a mean value circuit for obtaining a mean value of an output of said adding circuit;

a sample and hold circuit for sampling and holding an output from the clock pit, and

a comparator for comparing an output of said mean value circuit and an output of said sample and hold circuit obtained by sampling and holding the output from the clock pit,

wherein said comparator generates an on-track signal for setting an on-track state when the output of said sample and hold circuit from the clock pit is larger than the output of said mean value circuit.

5,587,987

INFORMATION RECORDING METHOD HAVING A LIQUID CRYSTAL SUBSTRATE

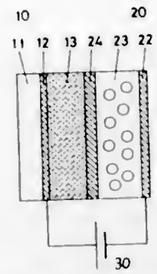
Masato Okabe, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 532,153

Claims priority, application Japan, Sep. 22, 1994, 6-227944

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—126 **7 Claims**



1. An information recording method using an integrated type of information recording system having a photoconductive layer, a dielectric interlayer, a liquid crystal recording layer and an electrode layer stacked on a transparent electrode in the described order, wherein the photoconductive layer is exposed to information light with voltage applied across both electrodes of the system so that the liquid crystals are oriented to record image information depending on the quantity of the exposure light, characterized in that:

from the following equations:

$$V_S(0) = \frac{C_M C_L}{C_S C_M + C_M C_L + C_L C_S} V_{AP}$$

$$V_M(0) = \frac{C_L C_S}{C_S C_M + C_M C_L + C_L C_S} V_{AP}$$

$$V_L(0) = \frac{C_S C_M}{C_S C_M + C_M C_L + C_L C_S} V_{AP}$$

$$I_S + C_S(dVS/dt) = I_M + C_M(dV_M/dt) = I_L + C_L(dV_L/dt)$$

$$V_S + V_M + V_L = V_{AP}$$

$$dV_M/dt = \frac{C_L I_S - (C_S + C_L) I_M + C_S I_L}{C_S C_M + C_M C_L + C_L C_S}$$

$$dV_L/dt = \frac{C_M I_S + C_S I_M - (C_S + C_M) I_L}{C_S C_M + C_M C_L + C_L C_S}$$

$$V_M(t + \Delta t) = V_M(t) + (dV_M/dt)\Delta t$$
$$V_L(t + \Delta t) = V_L(t) + (dV_L/dt)\Delta t$$

where V_{AP} is the voltage applied across both electrodes; C_S, C_L and C_M are the capacities of the photoconductive layer, the liquid crystal recording layer and the interlayer, respectively; V_S, V_L and V_M are the voltages applied on the respective layers; I_S, I_L and I_M are the currents flowing through the respective layers; and $V_S(0)$, $V_M(0)$ and $V_L(0)$ are the voltages applied on the respective layers just after the application of voltages, changes-with-time in the voltages of exposed and unexposed portions of the liquid crystal recording layer with respect to the photoconductive layer having a varying dark current value are found by varying the applied voltage, and the applied voltage and the value of the dark current through the photoconductive layer are determined such that when the voltage of the unexposed portion of the liquid crystal recording layer reaches the threshold voltage of the liquid crystal recording layer, the difference in voltage between the exposed and unexposed portions of the liquid crystal recording layer reaches a maximum, so that information is recorded with the photoconductive layer and at the applied voltage, where a potential difference is obtained, which is at least one half of the difference maximum contrast in the voltages applied on the liquid crystals at the exposed and unexposed portions of the liquid crystal recording layer.

5,587,988

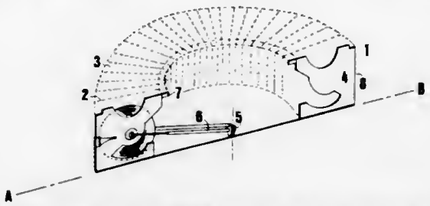
COMPUTER CONTROLLED DISK STORAGE UNIT WITH A TELESCOPIC ARM FOR READING AND WRITING INFORMATION ON A DISK LOCATED IN A MAGAZINE

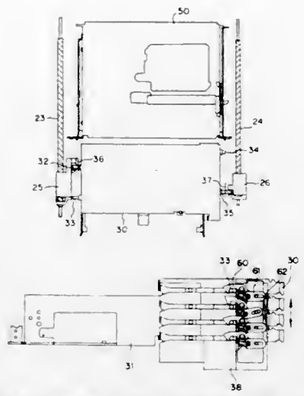
Gilles Boulanger, 2100 Route 112 #106, Magog, Quebec, Canada

Filed Nov. 17, 1993, Ser. No. 153,917

Int. Cl.[6] G11B *17/24*

U.S. Cl. 369—178 **3 Claims**





1. A computer controlled disk storage unit used for selecting any one of a plurality of disks and reading and/or writing from and onto any of the said disks, said unit comprising:

a toroidal magazine means comprising a plurality of slots to hold individual disks in place and to allow rotation of said disks when information is to be read from or written to said disks, each one of said slots includes a pressure plate on each side of the slot located on the inside of the slot so that the pressure plates are freely rotating against said slot for firmly holding the disks, rubber caps on each side of the slot located on the inside of the slot with each rubber cap adjacent a side of one of said pressure plates, said rubber caps fit inside a center hole of one of said plurality of disks to firmly hold and center the disk, and a friction gear on one side of the slot located on the outside of the slot on a side of one of the pressure plates opposite to the side the rubber cap is located on;

a player/recorder means embodied in the form of a telescopic arm situated in the middle of the toroidal magazine and able to align itself with any one of the slots containing disks and said telescopic arm provided with means for extending itself to reach any one of said disks situated inside any one of said slots to rotate and read or write information from and onto said disk while the disk is in said slot;

said telescopic arm made of two parallel prongs extending outwardly from its base, one of said prongs being a drive shaft with a second friction gear on one end of said shaft that engages with the friction gear located on the outside of the slot of a selected disk to induce rotation using power from a motor situated at the base of the telescopic arm, and the other of said prongs holding a data reading/writing means to read and/or write data from/onto said selected disk in said slot.

5,587,989

CARTRIDGE CHANGING APPARATUS INCLUDING A PAIR OF BASE CARRIERS AND A PAIR OF SLIDE CARRIERS

Tatsunori Fujiwara; Yasuyuki Nakanishi; Koutarou Oka; Kei Shirahata, and Shigehiro Itou, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1995, Ser. No. 423,751

Claims priority, application Japan, Oct. 3, 1994, 6-238903

Int. Cl.[6] G11B *3/00;17/04;17/08*

U.S. Cl. 369—178 **17 Claims**

1. A cartridge changing apparatus for replacing a cartridge containing a disc, said cartridge changing apparatus comprising:

a plurality of holders, each holding a cartridge inserted therein;

a plurality of pins fixed to said plurality of holders;

a loading motor, loading any cartridge held in any of said plurality of holders;

a synchronizing shaft, transmitting a rotating force of said loading motor;

a pair of screw shafts, further transmitting the rotating force transmitted from said synchronizing shaft;

a pair of base carriers, each having a gripping portion for gripping one of said plurality of pins on a holder and each engaged with one of said pair of screw shafts, said pair of base carriers being moved along axes of said pair of screw shafts as said pair of screw shafts are rotated; and

a pair of slide carriers which are combined with said pair of base carriers and are moved on said pair of screw shafts together with said base carriers, each of said pair of slide carriers restricting a vertical movement of one of said plurality of pins gripped within the gripping portion of a corresponding one of said pair of base carriers in cooperation with the corresponding one of said pair of base carriers while one of said holder is carried.

5,587,990

OPTICAL DISC SYSTEM AND OPTICAL DISC THEREFOR

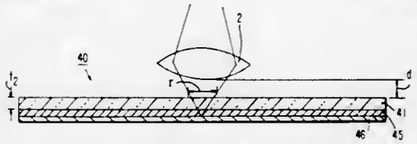
Tetsu Watanabe, and Yoshio Aoki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 383,351, Feb. 3, 1995, Pat. No. 5,533,001, which is a division of Ser. No. 277,357, Jul. 19, 1994, Pat. No. 5,392,263, which is a continuation of Ser. No. 761,874, Sep. 13, 1991, abandoned. This application Jul. 7, 1995, Ser. No. 499,331

Claims priority, application Japan, Jan. 31, 1990, 2-21210

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—275.2 **4 Claims**



1. An optical recording medium used in an optical recording and/or reproducing apparatus having at least one light source for radiating a light beam and at least one objective lens for converging the light bream on an optical axis thereof, the wavelength of the light beam radiated from the light source falling within a range of 635 to 650 nm, the numerical aperture of the objective lens being 0.6, said medium comprising:

a recording layer; and

a light-transmitting cover layer provided on the one surface of said recording layer and transmitting the light bream to irradiate on said recording layer, wherein the thickness of the light transmitting cover layer falls within a range of 0.55 to 0.6 mm.

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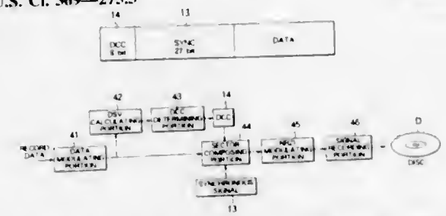
5,587,991
RECORDING MEDIUM, SIGNAL RECORDING APPARATUS THEREOF, AND SIGNAL REPRODUCING APPARATUS THEREOF

Daiki Nabeshima, and Naoki Ozaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawagawa-ken, Japan

Filed Jan. 18, 1995, Ser. No. 375,428
Claims priority, application Japan, Mar. 16, 1994, 6-046010
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—275.3 7 Claims



4. A signal recording apparatus of a recording medium, comprising:

DSV calculating means for calculating a DSV of a signal wave form recorded on the recording medium;

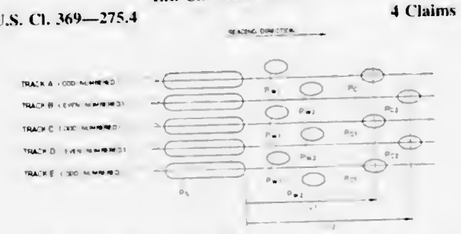
cancel code generating means for generating a cancel code for suppressing a DC component of the signal wave form corresponding to the DSV calculated by said DSV calculating means; and

recording means for connecting a synchronous code and record data to the cancel code generated by said cancel code generating means and recording the cancel code, the synchronous code, and the record data on the recording medium so that the cancel code and the synchronous code are adjacently disposed, the synchronous code being adapted for synchronizing with data.

5,587,992
SAMPLED-SERVO TYPE OPTICAL DISK HAVING CLOCK PITS ARRANGED OFFSET FROM EACH OTHER IN THE DISK RADIAL DIRECTION

Hideki Hayashi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 17, 1994, Ser. No. 343,947
Claims priority, application Japan, Nov. 19, 1993, 5-290959
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—275.4 4 Claims



1. An optical disk of a sampled servo type comprising:

a plurality of tracks which are spaced from each other in a radial direction of the disk;

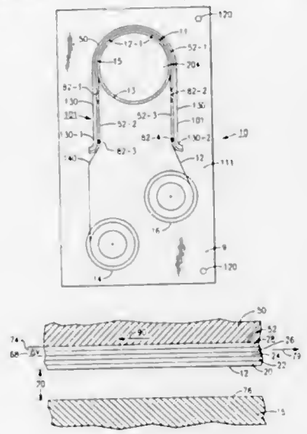
a plurality of synchronization pits, each disposed on a corresponding one of said tracks in a servo area of the disk and aligned with each other in the radial direction of the disk; and

a plurality of clock pits formed in said servo area on each of said tracks and arranged to deviate from each other in a reading direction of said disk per adjacent track.

5,587,993
OPTICAL TAPE CARTRIDGE HAVING IMPROVED TAPE MOVEMENT MECHANISM

David P. Gregg, Culver City, Calif., assignor to DiscoVision Associates, Irvine, Calif.

Filed Jun. 30, 1994, Ser. No. 268,992
Int. Cl.[6] G11B 7/24
U.S. Cl. 369—291 26 Claims



1. An optical tape cartridge suitable for playing by a player, the player associated with a voltage supply capable of supplying said optical tape cartridge with a controllably variable voltage, said optical tape cartridge comprising:

a sealed cartridge housing;

first and second tape reels disposed within said sealed cartridge housing, said first and second tape reels each being freely rotatable and acting as tape supply and tape take up reels;

an optical tape having a first surface end an optically recordable side, said optical tape being wound on and thereby coupling each of said first and second reels by a

an optical tape having a first surface and an optically recordable side, said optical tape being wound on and thereby coupling each of said first and second reels by a segment of said optical tape so that said optically recordable side faces away from each of said reels, said optical tape further having a conductive layer extending substantially the length thereof, said conductive layer being grounded;

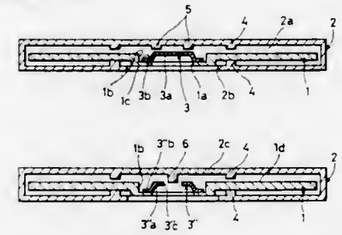
sealed window means being positioned on a surface of said sealed cartridge housing and disposed across a portion of said segment of said optical tape for enabling optical reading from said segment; and

conductive guide means for guiding said segment of said optical tape past said sealed window means, said conductive guide means having a portion disposed adjacent said sealed window means and being connected to the controllably variable voltage supplied by the voltage supply, said first surface of said segment thereby being maintained a predetermined, substantially fixed distance from said sealed window means by electrostatically attracting said conductive layer of said segment toward said conductive guide means with an attractive force controlled by the supplied voltage, said attractive force being changeable by corresponding changes in applied voltage so that a preselected fixed distance is maintained between said conductive guide means and said segment of optical tape.

5,587,994
CARTRIDGE USED FOR A DISC-SHAPED RECORDING MEDIUM

Toshikazu Nagaura, Nara; Zenjiro Yamashita, Yamatokoriyama; Kazuhiko Arikawa, Yamabe-gun, and Kenji Ohta, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 63,950, May 20, 1993, abandoned.
This application Oct. 11, 1994, Ser. No. 321,451
Claims priority, application Japan, Jun. 3, 1992, 4-142732
Int. Cl.[6] G11B 17/03;23/00
U.S. Cl. 369—291 22 Claims



1. A cartridge used for a disc-shaped recording medium comprising:

a recording medium which is shaped into a disc having a center hole for use in positioning and a recessed section formed around the center hole;

a clamping plate formed into a hat shape having a flat brim for clamping the recording medium by the use of magnetic force, the flat brim having a top and bottom surface and an outer edge surface perpendicular to the top and bottom surfaces that forms an outermost edge surface of the clamping plate the flat brim extending outwardly in a radial direction, the clamping plate being placed in the recessed section so that, the outermost edge surface is located totally in the recessed section and is completely surrounded by a wall of the recessed section, with the total area of the bottom surface in direct physical contact with the recessed section, a part of the recording medium being sandwiched between the bottom surface and a turntable that is inserted into the center hole; and

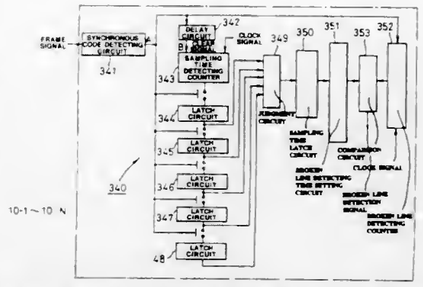
a case for housing the recording medium and the clamping plate so as to permit them to freely rotate therein, the case being provided with a through hole which allows the turntable to be removably inserted therein,

wherein the recessed section is formed into a shape that is recessed toward the through hole and houses the clamping plate so as to permit it to move therein, the clamping plate being provided with a height dimension in a rotational-axis direction of the recording medium that is set to be greater than the distance between the recording medium and the inner surface of the case.

5,587,995
SERIAL CONTROLLER

Makoto Takebe, and Masao Hagiwara, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Division of Ser. No. 861,862, Jun. 17, 1992, Pat. No. 5,461,617. This application May 8, 1995, Ser. No. 436,931
Claims priority, application Japan, Dec. 26, 1989, 1-336888; Dec. 27, 1989, 1-343482; Jan. 30, 1990, 2-19933; Oct. 30, 1990, 2-113743
Int. Cl.[6] H04J 3/14
U.S. Cl. 370—248 6 Claims



1. A serial controller in which a plurality of nodes and a main controller are connected in series through a signal line, the main controller including:

data transmission means for transmitting data frame signals serially at a predetermined period to the plurality of nodes;

reception means for receiving the data frame signals inputted through the plurality of nodes,

each node including:

reception time interval measurement means for measuring a reception time interval of successive data frame signals;

a plurality of measured value storage means for storing measured values measured by the reception time interval measurement means for a plurality of reception periods, respectively;

broken-line detection time setting reference value selection means for selecting one of the measured values which is most frequently measured in the plurality of reception periods stored in the plurality of measured value storage means and, setting the selected one of the measured values as a reference value for a broken-line detection time setting;

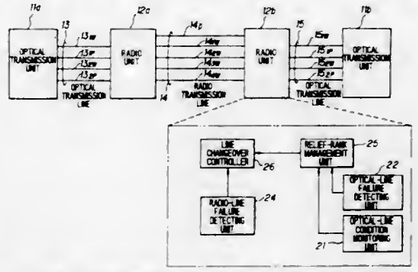
broken-line detection time setting means for setting the broken-line detection time on the basis of the reference value selected by the broken-line detection time setting reference value selection means; and

comparison means for comparing the set value set by the broken-line detection time setting means with the measured value measured by the reception time interval measurement means for each reception interval and outputting a broken-line detection signal when the measured value is greater than the set value.

5,587,996
METHOD OF RADIO-LINE RELIEF AND RADIO EQUIPMENT IN SDH NETWORK

Shingo Mizuno, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 18, 1995, Ser. No. 529,663
Claims priority, application Japan, Feb. 2, 1995, 7-015749
Int. Cl.[6] H04B 10/08
U.S. Cl. 370—228 16 Claims



1. A method of relieving a radio line in a synchronous digital hierarchy (SDH) network in which a radio transmission line is introduced between optical transmission lines each of which has a plurality of optical lines, comprising the steps of:

providing radio working lines corresponding to respective ones of optical lines and providing one radio standby line;

monitoring occurrence of failure in each optical line and occurrence of failure in the radio working lines;

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when occurrence of failure in an optical line has been detected, making rank for relief of the radio working line corresponding to this optical line lower than rank for relief of radio working lines corresponding to optical lines that have not failed; and

when failure has occurred in two or more radio working lines, transmitting data, which is to be sent to a radio working line having a higher rank for relief, via the radio standby line and relieving the radio working lines in which the failure has occurred.

5,587,997

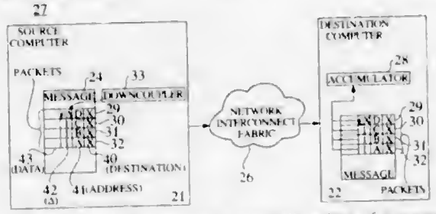
METHOD AND APPARATUS FOR DETERMINING WHEN ALL PACKETS OF A MESSAGE HAVE ARRIVED

David M. Jacobson, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1995, Ser. No. 393,650

Int. Cl.[6] H04J *3/22*

U.S. Cl. 370—253 **26 Claims**



1. An apparatus for determining when all packets of a message sent across a computer network have arrived at their destination, comprising:

a counter located at at least one source computer, said counter storing an initial value therein and being adapted to assign a delta value to each packet in a message, wherein a first delta value is assigned to each packet in a message but the last packet;

means for decrementing said counter for each packet sent, wherein said counter stores a second delta value that is to the initial value store in the counter decreased by the number of packets previously sent, and wherein said second delta value is assigned to said last packet; and

an accumulater located at a destination computer, said accumulater being adapted to extract said delta value from each packet of said message;

wherein said destination computer is notified that all packets in said message have arrived only when the sum of said extracted delta values stored in said accumulator is equal to the initial value stored in aid accumulator.

5,587,998

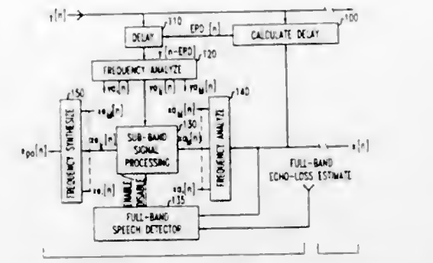
METHOD AND APPARATUS FOR REDUCING RESIDUAL FAR-END ECHO IN VOICE COMMUNICATION NETWORKS

Patrick M. Velardo, Jr., Belleville, and Woodson D. Wynn, Basking Ridge, both of N.J., assignors to AT&T, Holmdel, N.J.

Filed Mar. 3, 1995, Ser. No. 398,272

Int. Cl.[6] H04B *3/20*

U.S. Cl. 370—289 **35 Claims**



6. A method for processing FAR-IN communication signals received by a local network from a remote network, thereby to reduce energy content that is attributable to echoes, returned by the remote network, of NEAR-IN signals that were placed in the local network for transmission to the remote network, the method comprising:

a) measuring a delay between the NEAR-IN signals and the arrival of corresponding echoes in the FAR-IN signals;

b) analyzing the FAR-IN signals into a plurality of frequency sub-band components to be referred to as FAR-IN sub-band signals, delaying the NEAR-IN signals by the measured delay, and analyzing the delayed NEAR-IN signals into a plurality of frequency sub-band components, to be referred to as NEAR-IN sub-band signals;

c) processing a copy of each NEAR-IN sub-band signal to create a time-varying signal which represents the smoothed energy content of the NEAR-IN sub-band signal delayed by the measured delay and attenuated by an estimated transmission loss for echoes, said time-varying signal to be referred to as a TEMPLATE;

d) in a non-linear processor, passing each FAR-IN sub-band signal substantially without attenuation if it exceeds a threshold derived at least in part from the corresponding TEMPLATE;

e) in the non-linear processor, attenuating each FAR-IN sub-band signal if it lies within a defined range below the corresponding said threshold, and

f) synthesizing the nonlinearly processed FAR-IN sub-band signals to form an echo-reduced fullband FAR-IN signal.

5,587,999

D CHANNEL PACKET COMMUNICATION SYSTEM AND A METHOD OF D CHANNEL PACKET COMMUNICATION

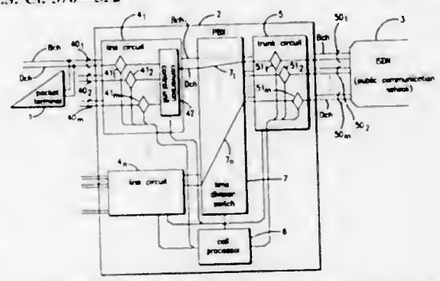
Koji Endo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 514,743

Claims priority, application Japan, Aug. 12, 1994, 6-190332

Int. Cl.[6] H04J *3/12*; **H04L** *12/56*

U.S. Cl. 370—352 **9 Claims**



1. A D channel packet communication system in a private branch exchange having a plurality of line circuits, each one of said plurality of line circuits connecting a plurality of subscriber lines for packet terminals to said private branch exchange, a plurality of trunk circuits, each one of said plurality of trunk circuits connected to a plurality of subscriber lines of a public ISDN switching system in a network, a time division switch for providing connection paths between each one of said plurality of line circuits and each one of said plurality of trunk circuits and a call processor for controlling overall operations of said private branch exchange, said D channel packet communication system comprising:

a conversion control unit comprising

means for receiving first conversion information including first connection control information allocated to a D channel packet transferred between one of said packet terminals and said private branch exchange, and second connection control information allocated to D channel packet transferred between said private branch exchange and said network;

means for deriving second conversion information having correspondences between said first connection control information and said second connection control information at a beginning of D channel packet communication based on said first conversion information, said deriving means cooperating with said receiving means; and

converting means for converting said first connection control information in said D channel packet received form one of said packet terminals to said second connection control information for a D channel packet to be sent to said network, converting said second connection control information in said D channel packet received from said network to said first connection control information for said D channel packet to be sent to one of said packet terminals, based on said second conversion information, said converting means cooperating with said receiving means;

a plurality of first switching control units, each one of said plurality of first switching control units connecting to one of said plurality of subscriber lines for one of said packet terminals, identifying D channel information received from one of said packet terminals, establishing a path to said conversion control unit where a D channel packet is being received, and establishing a path to said call processor where information other than said D channel packet is being received;

a plurality of second switching control units; each one of said plurality of second switching control units connected to one of said plurality of subscriber lines of said public ISDN switching system, identifying D channel information from said public ISDN switching system, establishing a path to said time division switch where a D channel packet is being received and establishing a path to said call processor where information other than said D channel packet is being received; and

a plurality of permanent connection paths in said time division switch, each making a permanent connection between said conversion control unit and one of said second switching control units.

5,588,000

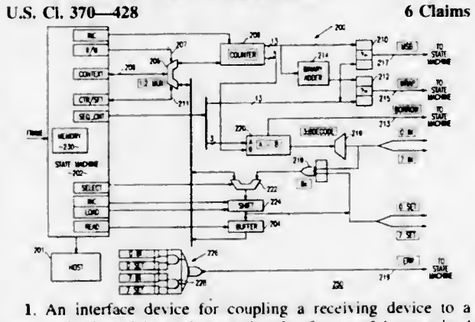
APPARATUS FOR REORDERING DATA FRAMES WITHIN AN INTERFACE DEVICE

Wayne T. Rickard, Oceanside, Calif., assignor to Emulex Corporation, Costa Mesa, Calif.

Filed Mar. 27, 1995, Ser. No. 410,712

Int. Cl.[6] H04L *12/54*

U.S. Cl. 370—428 **6 Claims**



1. An interface device for coupling a receiving device to a communications link and for ensuring that frames of data received by the interface device, each frame being included within a sequence of frames, are communicated to the receiving device in a predetermined order defined by an external transmitting device, the interface device including:

(a) a control circuit for processing information contained in each frame of data; and

(b) a comparator window circuit coupled to, and controlled by, the control circuit, wherein each valid frame received by the interface device is associated with a value that indicates the relative position of that frame within the predetermined order, the comparator window circuit having:

(1) a missing frame window storing means for storing a missing frame window which indicates whether the last received frame is the next expected frame in the order defined by the external transmitting device,

(2) a counter, operatively coupled to the control circuit, for storing the value associated with the next expected frame and capable of incrementing the value stored in the counter by a predetermined value upon command from the control circuit when the missing frame window indicates that the last received frame is the next expected frame,

(3) a comparator, coupled to the counter and the control circuit, for comparing a value associated with the next expected frame with a value associated with a last received frame and indicating whether the value associated with the last received frame is within a predetermined range of values relative to the value of the next expected frame, and

(4) a shift register coupled to the control circuit and coupled to an input to the missing frame window storing means, such that a missing frame window input to the missing frame window storing means may be shifted under the control of the control circuit prior to being stored in the missing frame window storing means when the missing frame window indicates that the last received frame is the next expected frame.

5,588,001

Patent Not Issued For This Number

5,588,002

MULTIPLEX TRANSMISSION APPARATUS FOR SUPPORTING PRIORITIZED COMMUNICATIONS AMONG A PLURALITY OF NETWORK NODES

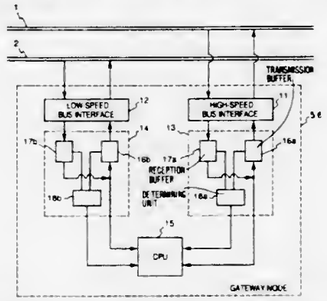
Toshiaki Kawanishi; Yoshikazu Nobutoki; Seiji Hirano, and Koji Terayama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 100,965, Aug. 3, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 408,190

Claims priority, application Japan, Aug. 6, 1992, 4-210245

Int. Cl.[6] H04L *12/46*

U.S. Cl. 370—462 **7 Claims**



1. A multiplex transmission apparatus having a plurality of control units connected independently of one another over a plurality of multiplex transmission lines, each of said plurality of

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control units having a central processing unit to perform transmission and reception of signals over said plurality of multiplex transmission lines via an internal memory of each of said control units, and said memory temporarily stores said signals, the apparatus comprising:

means for judging, in the central processing unit, which transmission line among said plurality of multiplex transmission lines is a source of a received signal;

means for determining, in the central processing unit, whether a signal to be transmitted to a first transmission line which is one of said plurality of multiplex transmission lines remains non-volatilized in said memory;

means for judging, in the central processing unit, whether the received signal is identical with the signal to be transmitted to the first transmission line, if it is determined that the received signal is from the first transmission line and if it is determined that the signal to be transmitted to the first transmission line remains in said memory; and

means for inhibiting, in the central processing unit, transmission of the signal which is to be transmitted to the first transmission line, if it is judged that the received signal is identical with the signal to be transmitted to the first transmission line.

5,588,003

LAN-WAN-LAN COMMUNICATION METHOD, AND APPARATUS FOR LAN-WAN CONNECTION

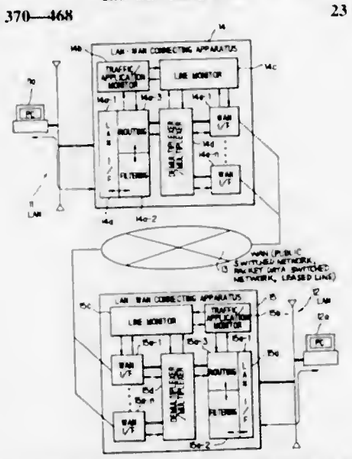
Toshimitsu Ohba; Kiyotaka Shikata, and Osamu Sekihata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 17, 1994, Ser. No. 198,070

Claims priority, application Japan, May 26, 1993, 5-123720

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—468 **23 Claims**



1. A LAN-WAN-LAN communication method in a LAN-WAN-LAN connecting apparatus, for performing communication between a local area network (LAN) on a transmitting side and a local area network (LAN) on a receiving side via a wide area network (WAN) within limits of a band allocated by said apparatus, the method comprising the steps of:

demultiplexing a frame, which has been received from the LAN on the transmitting side, into data constituting smallest units of information, and transmitting this data via a plurality of lines;

multiplexing data, which is sent to the receiving side via each line, on the receiving side so as to generate a frame and sending the generated frame to the LAN on the receiving side;

obtaining traffic between the LAN on the transmitting side and the LAN on the receiving side when a request for transfer of a new frame has been issued from a terminal which is connected to the LAN on the transmitting side;

obtaining a band required for the transfer of the new frame on the basis of the traffic;

performing communication upon increasing the number of lines used in LAN-WAN-LAN communication in such a manner that the band obtained in said band obtaining step is satisfied;

providing a table for storing a list of idle lines;

investigating whether a sufficient number of idle lines that satisfy the obtained band are available;

reducing a band to obtain a new band in the absence of the sufficient number of idle lines that satisfy the obtained band; and

increasing the number of lines to be used in said communication so as to satisfy the new band.

5,588,004

BUS SYNCHRONIZING METHOD AND SYSTEM BASED THEREON

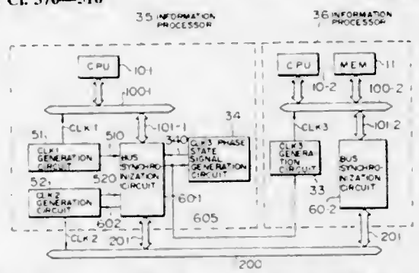
Shinichi Suzuki; Yukihiro Seki, and Ryuichi Hattori, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 405,857

Claims priority, application Japan, Sep. 7, 1994, 6-213993

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—516 **9 Claims**



9. A bus synchronizing method comprising the steps of:

generating respective phase state signals of at least two clocks of synchronous buses when said at least two clocks are transmitted through the buses, said respective phase state signals indicating phase states of the respective clocks;

defining a phase state combination for performing phase shift, clocks to be phase shifted and respective phase shift duration times, the phase shift duration times being defined to reduce synchronization overhead during transmission of the bus signals;

comparing the phase state signals; and

performing phase shifts of the defined phase shift duration times over the defined clocks when the comparison results coincide with the defined phase state combination.

5,588,005

PROTOCOL AND MECHANISM FOR PRIMARY AND MUTTER MODE COMMUNICATION FOR ASSET TRACKING

Irfan Ali, Niskayuna; John E. Hershey, Ballston Lake; Stephen M. Hladik, Albany, all of N.Y.; Amer A. Hassan, Cary, N.C.; Sandeep Channakeshu, Cary, N.C.; Ravinder D. Koilpillai, Cary, N.C.; Kenneth B. Welles, II, and Harold W. Tomlinson, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1995, Ser. No. 487,272

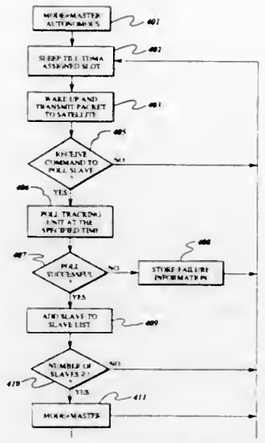
Int. Cl.[6] H04Q *7/00*

U.S. Cl. 370—346 **6 Claims**

1. A method of tracking assets comprising the steps of:

affixing a battery powered tracking unit to each asset to be tracked;

communicating with each tracking unit from a central station to receive from each tracking unit identification (ID), location, battery strength, and signal quality;



storing and maintaining a table at the central station, said table including the ID, location, battery strength, and signal quality of each tracking unit;

sorting at the central station tracking units in the table by location to identify tracking units within groups proximate to one another;

sorting at the central station tracking units within each group to identify a tracking unit within said each group which has acceptable battery strength and signal quality; and

establishing a mobile local area network of tracked assets among a plurality of tracking units within said each group, each of said tracking units constituting a node of the mobile local area network, with a tracking unit within the group having acceptable battery strength and signal quality acting as a master unit and other tracking units in the group acting as slave units.

5,588,006

LOGIC CIRCUIT HAVING A CONTROL SIGNAL SWITCHING LOGIC FUNCTION AND HAVING A TESTING ARRANGEMENT

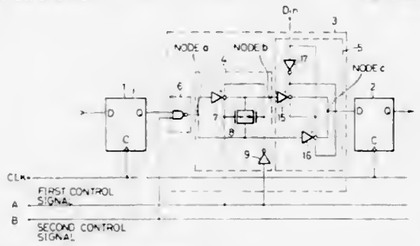
Yasuyuki Nozuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Oct. 21, 1993, Ser. No. 139,011

Claims priority, application Japan, Oct. 22, 1992, 4-284101

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—3 **10 Claims**



1. A logic circuit comprising:

a first circuit with two output terminals, wherein a second input signal and a first control signal are received, and, in the case where the first control signal has one logical value, the second input signal and the inverse value of the second input signal are output from each of the output terminals, and in the case where the first control signal has another logical value, the second input signal is output from both of the two output terminals; and

a second circuit, wherein a first input signal and the output signal from the first circuit are received, and, in the case where the first control signal has the one logical value, an exclusive NOR value of the first input signal and the second input signal is output by selecting the second input signal or its inverse value that is output from the first circuit in accordance with the logical value of the first input signal, then inverting and outputting the selected second input signal, and in the case where the first control signal has the other logical value, the second input signal that is output from both of the two output terminals of the first circuit is inverted and output from the second circuit regardless of the logical value of the first input signal.

5,588,007

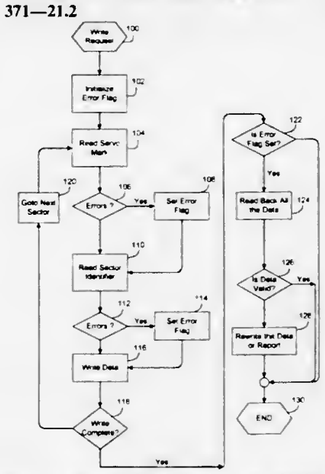
METHOD FOR DETECTING TRANSIENT WRITE ERRORS IN A DISK DRIVE

Yiping Ma, Layton, Utah, assignor to Iomega Corporation, Roy, Utah

Filed Apr. 26, 1996, Ser. No. 639,176

Int. Cl.[6] G11C *29/00;* **G06F** *7/02*

U.S. Cl. 371—21.2 **13 Claims**



1. A method of verifying the integrity of data written to a disk in a disk drive system, comprising the steps of:

(a) writing a first data section to a portion of the disk;

(b) periodically reading a pre-recorded signal from the disk;

(c) if said pre-recorded signal is substantially different from a predetermined value, reading the first data section written to the disk; and

(d) if said first data section read from the disk is substantially different from said first data section written to the disk, generating an error condition.

5,588,008

METHOD FOR GENERATING TEST PATTERNS FOR USE WITH A SCAN CIRCUIT

Tsuneo Nakata, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 26, 1992, Ser. No. 966,338

Claims priority, application Japan, Oct. 25, 1991, 3-279316

Int. Cl.[6] H04B *1/52*

U.S. Cl. 371—27 **8 Claims**

1. A method for generating test patterns for use with a scan circuit to detect a degenerative failure in a synchronous sequential circuit having a memory element comprising a predetermined scan register and a combinational circuit for inputting a value from an

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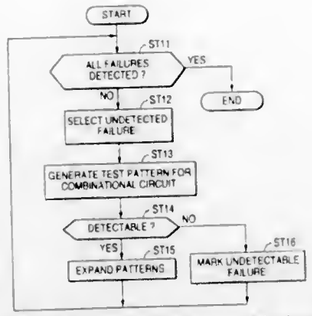


external input of the synchronous sequential circuit and said memory element, and for outputting a value to an external output of the synchronous sequential circuit and said memory element, said method for generating test patterns comprising:

a step of generating, for an undetected first failure, a first test pattern for use in a combinational circuit; and

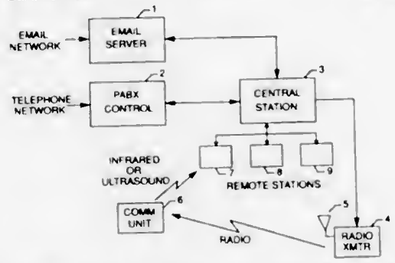
a step of pattern expansion for generating a second test pattern for detecting a second failure by changing the external input value of the synchronous sequential circuit, with value set in the predetermined scan register of said memory element fixed, with regard to the first test pattern generated in said generating step; and

a step of adding a mark for use when the undetected failure cannot be checked in the second test pattern.

5,588,009
PERSONAL PAGING, COMMUNICATIONS, AND LOCATING SYSTEM

Craig A. Will, 37675 Fremont Blvd. No. 23, Fremont, Calif. 94536

Filed Feb. 3, 1994, Ser. No. 191,111
Int. Cl.[6] H04L *1/18*
U.S. Cl. 371—33 **25 Claims**



1. A method for transmitting a message to an individual, comprising the steps of:

originating said message addressed to said individual;

transmitting the message to a central communications station;

receiving and storing the message at said central communications station;

creating a packet containing data from the message;

transmitting said packet to a communications unit carried by the individual by the steps of:

(1) computing an error checking code and adding said code to the packet;

(2) adding a code to the packet identifying said communications unit;

(3) transmitting the packet by means of radio to the communications unit;

(4) receiving the packet at the communications unit;

(5) computing an error checking code;

(6) determining whether the packet has been correctly received by comparing the error checking code computed at the communications unit with the error checking code contained in the packet;

(7) constructing a packet at the communications unit comprising a code identifying the communications unit;

(8) adding a code identifying and thus acknowledging the received packet to said packet constructed at the communications unit, should the received packet contain a correct error checking code;

(9) transmitting the packet constructed at the communications unit from the communications unit via a medium selected from the group consisting of infrared light and ultrasonic sound to one or more of a plurality of remote stations, should the received packet contain a correct error checking code;

(10) receiving the packet constructed at the communications unit from the communications unit at a remote station and temporarily storing it;

(11) transmitting the packet constructed at the communications unit from said remote station, by means of a communications circuit via a medium selected from the group consisting of wire and optical fiber, to said central station;

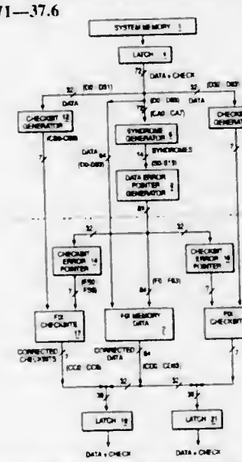
repeating the steps of creating the packet containing data from the message and transmitting the packet to a communications unit carried by the individual, until all data in the message has been transmitted from the central station to the communications unit;

displaying said message to the individual.

5,588,010
PARALLEL ARCHITECTURE ERROR CORRECTION AND CONVERSION SYSTEM

William R. Hardell, Jr., and Amjad Z. Qureshi, both of Austin, Tex., assignors to Internationnal Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1994, Ser. No. 282,334
Int. Cl.[6] H03M *13/00*; **G06F** *11/10*
U.S. Cl. 371—37.6 **11 Claims**



1. An error correction code conversion system, comprising:

means for generating error correction code checkbits from uncorrected input data;

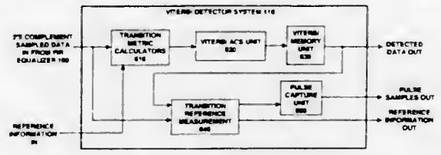
means for identifying corrections needed in the generated error correction code checkbits based upon the uncorrected input data and input checkbits related thereto; and

means for correcting tile generated error correction code checkbits responsive to the means for identifying.

5,588,011
TUNED VITERBI DETECTOR AND EQUALIZER SYSTEM

C. M. Riggle, 12995 Morris Trail, Colorado Springs, Colo. 80908-3232, assignor to C. M. Riggle, Colorado Springs, Colo.

Continuation of Ser. No. 288,475, Aug. 10, 1994, abandoned. This application Feb. 5, 1996, Ser. No. 596,927
Int. Cl.[6] G06F *11/10*; **G11B** *5/09*
U.S. Cl. 371—43 **37 Claims**



1. A method for use in detecting an input data stream via a Viterbi system, said method comprising the steps of:

providing a Viterbi detector capable of receiving input data samples and converting said input data samples into a digital output signal indicative of data stored on a recording medium or transmitted over a communication channel, said Viterbi detector comprising a trellis structure including:

a plurality of nodes arranged in a plurality of rows and columns, each row associated with a distinct state of said Viterbi detector and each column associated with a distinct level of said Viterbi detector;

a plurality of state metrics, each state metric associated with one of said distinct states of said Viterbi detector; and

a plurality of paths between nodes in adjacent levels in said Viterbi detector, each path having a corresponding transition reference value;

tuning a transition reference value associated with a first path of said trellis structure by changing said transition reference value from a first value to a second value, said first path beginning at a state in a first level and terminating at a state in a second level;

calculating a transition metric for said first path using said second value of said transition reference value and at least one of said input data samples;

combining said transition metric corresponding to said first path with a state metric corresponding to said beginning state in said first level to update said state metric associated with said terminating state in said second level; and

choosing a most likely path through said trellis structure using said updated state metric, said most likely path being representative of said digital output signal;

wherein said step of tuning improves the error rate performance of said Viterbi detector.

5,588,012
APPARATUS AND METHOD FOR ENSURING DATA IN EXTERNAL STORAGE SYSTEM

Yumiko Oizumi, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

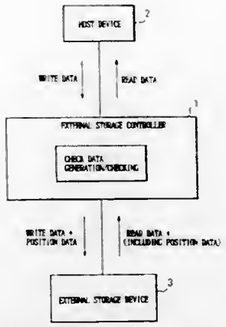
Filed Dec. 17, 1992, Ser. No. 992,450
Claims priority, application Japan, Feb. 10, 1992, 4-023750
Int. Cl.[6] G11C *29/00*
U.S. Cl. 371—51.1 **13 Claims**

1. An apparatus for ensuring data written to and read from an external storage system comprising:

a host device;

at least one external storage device for writing and reading data to and from a recording medium, said external storage device having a device controller including a buffer and a check data verification circuit; and

a data transfer external storage controller disposed between said host device and said device controller for controlling said external storage device in accordance with a command issued



from a host device, said external storage controller transferring read data from said device controller to said host device and transferring write data from the hos' device to said device controller;

wherein said external storage controller adds check data to said write data from said host device, each time write data is transferred from said host device to said external storage device, said storage controller calculating said check data using distinctive information on a position of said external storage device in which said write data is written as a seed value so that said check data is representative of both data content and location, and

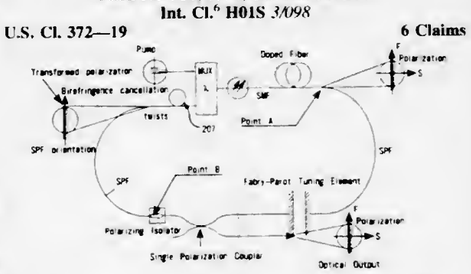
wherein said external storage controller transfers said write data, to which said check data is added, to said device controller, and said device controller buffers the data in said buffer, and said check data verification circuit verifies that the write data is correct using said check data,

said device controller further transferring said write data and said check data to said external storage device if the check data circuit verifies that the write data is correct.

5,588,013
POLARIZATION CONTROLLED TUNEABLE RING LASER

Paul Reitz, Palmyra, and Hatem Abdelkader, Harrisburg, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 30, 1994, Ser. No. 347,537
Int. Cl.[6] H01S *3/098*
U.S. Cl. 372—19 **6 Claims**



1. A controlled polarization, tuneable ring laser, comprising:

(a) A source for optical pumping coupled to means for multiplexing light signals;

(b) A section of fiber twisted to induce a selected amount of birefringence in said section of twisted fiber connected to said means for multiplexing light signals;

(c) A first segment of optical fiber connecting said section of twisted fiber to a polarizing optical isolator polarizer;

(d) Means for optically selecting a mode of light traveling in said ring laser to a selected bandwidth connected to said polarizing optical isolator, said means for tuning light connected to an output coupler; and

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(e) A second segment of optical fiber connected to said output coupler, said second further connected to a section of doped optical fiber, said doped fiber further connected to said multiplexer, thereby completing a laser ring cavity.

5,588,014

OPTICAL WAVELENGTH CONVERTING APPARATUS

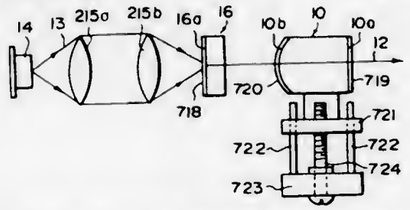
Yoji Okazaki; Chiaki Goto; Hiroaki Hyuga, and Akinori Harada, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 208,139, Mar. 9, 1994, Pat. No. 5,432,807, which is a division of Ser. No. 843,719, Feb. 28, 1992, Pat. No. 5,315,433. This application Apr. 6, 1995, Ser. No. 417,673

Claims priority, application Japan, Feb. 28, 1991, 3-33954; Mar. 1, 1991, 3-36098; Apr. 12, 1991, 3-79849; Apr. 15, 1991, 3-82333; Apr. 17, 1991, 3-85322; Apr. 17, 1991, 3-85595; Apr. 18, 1991, 3-86404; Apr. 18, 1991, 3-86617

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—22 **6 Claims**



1. An optical wavelength converting apparatus, which comprises:

i) a crystal of a nonlinear optical material, which is located in a resonator of a laser diode pumped solid laser, said crystal converting a laser beam, which has been obtained from solid laser oscillation and serves as a fundamental wave which impinges upon said crystal, into its second harmonic by effecting the type II of phase matching between said fundamental wave and its second harmonic, and

ii) a wavelength selecting device, which is located in said resonator and selects the wavelength of said laser beam obtained from the solid laser oscillation such that the wavelength of said laser beam may be adjusted appropriately.

5,588,015

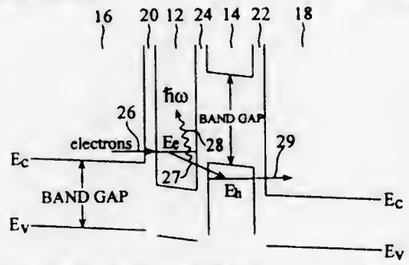
LIGHT EMITTING DEVICES BASED ON INTERBAND TRANSITIONS IN TYPE-II QUANTUM WELL HETEROSTRUCTURES

Rui Q. Yang, Houston, Tex., assignor to University of Houston, Houston, Tex.

Filed Aug. 22, 1995, Ser. No. 518,101

Int. Cl.[6] H01S *3/19*

U.S. Cl. 372—45 **21 Claims**



1. A light emitting device comprising:

a first cladding region of semiconductor material having conduction and valence allowed energy bands defined by corresponding band edges spaced apart by an energy band-gap;

a second cladding region of semiconductor material having conduction and valence allowed energy bands defined by corresponding band edges spaced apart by an energy band-gap;

a first quantum well region of semiconductor material having conduction and valence allowed energy bands defined by corresponding band edges spaced apart by an energy band-gap, said first quantum well region which is adjacent to said first cladding region having at least one energy state residing in said conduction band of said first quantum well region; and

a second quantum well region of semiconductor material having conduction and valence allowed energy bands defined by corresponding band edges spaced apart by an energy band-gap, said second quantum well region sandwiched between said first quantum well region and second cladding region, said first and second quantum well regions forming a type-II heterojunction, said second quantum well region having at least one energy state which is lower in energy than said energy state in said conduction band of said first quantum well region and is within said valence band of said second quantum well region, under a bias voltage each of said energy states residing within said allowed energy bands of said adjacent cladding region and simultaneously residing within at least one of the band-gaps of said adjacent quantum well region and the other cladding region.

5,588,016

SEMICONDUCTOR LASER DEVICE

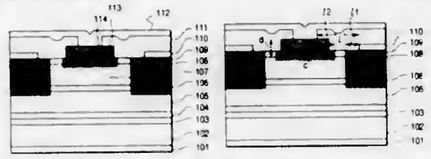
Hiromi Otoma; Nobuaki Ueki; Hideki Fukunaga; Hideo Nakayama; Yasuji Seko, and Mario Fuse, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1995, Ser. No. 523,389

Claims priority, application Japan, Sep. 6, 1994, 6-212650

Int. Cl.[6] H01S *3/19*

U.S. Cl. 372—46 **16 Claims**



1. A semiconductor laser device, comprising:

a) a substrate;

b) a first cladding layer made of semiconductor material of a first conductivity type and layered on said substrate;

c) a quantum well active layer made of semiconductor material and layered on said first cladding layer;

d) a second cladding layer layered on said quantum well active layer, said second cladding layer being made of semiconductor material of a second conductivity type that is opposite to said first conductivity type;

e) an intermediate layer made of semiconductor material of said first conductivity type or nonconductive type semiconductor, said intermediate layer being layered on said second cladding layer;

f) a contact layer made of semiconductor material of said first conductivity type of nonconductive type semiconductor, said contact layer being layered on said intermediate layer;

g) a mixed-crystal region of said first conductivity type in said intermediate layer, said second cladding layer, and said quantum well active layer, said mixed-crystal region not extending under said contact layer; and

h) a low resistance region of said second conductivity type extended over a range from said contact layer, through said intermediate layer, to said second cladding layer, said low resistance region being isolated from said mixed-crystal region by said intermediate layer.

5,588,017

OPTOELECTRONIC SEMICONDUCTOR DEVICE, SYSTEM FOR OPTICAL GLASS FIBRE COMMUNICATION HAVING SUCH A DEVICE, SEMICONDUCTOR DIODE LASER FOR USE IN SUCH A DEVICE, AND METHOD OF MANUFACTURING SUCH A DEVICE

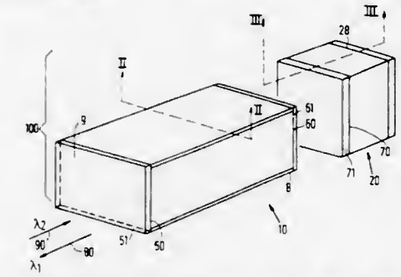
Maurice Groten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1995, Ser. No. 446,977

Claims priority, application European Pat. Off., May 24, 1994, 94201450

Int. Cl.[6] H01S *3/08;3/19*

U.S. Cl. 372—49 **19 Claims**



1. A optoelectronic semiconductor device (**100**) comprising a semiconductor diode laser (**100**) which at a first side (**50**) thereof emits a first radiation beam (**80**) with a first wavelength (λ_1) and which forms a radiation waveguide (**3**) for a second radiation beam (**90**) with a second wavelength (λ_2) greater than the first wavelength (λ_1), which second beam (**90**) can enter the semiconductor diode laser (**10**) at the first side (**50**), and a semiconductor photodiode (**20**) which is present at a second side (**60**) of the semiconductor diode laser (**10**) opposed to the first side (**50**), which is aligned relative to the semiconductor diode laser (**10**), and which is sensitive to radiation of the second wavelength (λ_2), characterized in that the semiconductor diode laser (**10**) and the semiconductor photodiode (**20**) are discrete semiconductor components which are provided in series along a single straight radiation path, and the semiconductor device (**100**) is provided with coating means (**51**, **61**, **71**) whereby during use the major portion of the emission of the semiconductor diode laser (**10**) is formed by the first radiation beam (**80**), substantially exclusively the first radiation beam (**80**) issues from the first side (**50**) of the semiconductor diode laser (**10**), and substantially the entire second radiation beam (**90**) is capable of reaching the semiconductor photodiode (**20**).

5,588,018

METALLURGICAL CONTAINER COMPRISING A HEARTH BOTTOM ELECTRODE

Philippe Destannes, Metz, France, assignor to Usinor Sacilor Societe, Puteaux, and Clecim Societe, Cergy Pontoise Cedex, both of France

Filed Oct. 14, 1994, Ser. No. 324,094

Claims priority, application France, Oct. 15, 1993, 93 12471

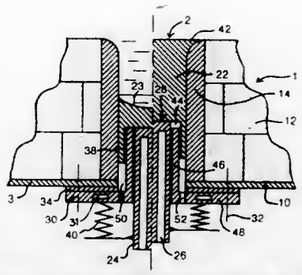
Int. Cl.[6] H05B *7/02*

U.S. Cl. 373—72 **18 Claims**

1. Metallurgical container comprising:

a vessel having an inner refractory lining and a bottom wall;

a hearth bottom electrode extending through the bottom wall of the vessel and through the refractory lining, said bottom electrode comprising and comprising in a superposed condition, 1), a bar which is flush with surface of the refractory lining and 2) a connector which is fastened under the bar, the connector being internally cooled, having an outer diameter smaller than that a diameter of the bar, and being attached to the bar at an upper front face of the connector at a level situated within a thickness of the refractory lining, and



a ring, which is interlocked to the bottom wall, which surrounds the connector, and which has an upper face 1) located below the bar and 2) capable of contacting and supporting the bar,

wherein the bar includes a skirt which extends downwardly towards the bottom wall and which surrounds the connector laterally.

5,588,019

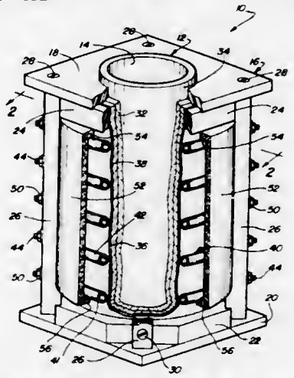
HIGH PERFORMANCE INDUCTION MELTING COIL

Robert S. Ruffini, Birmingham; Robert J. Madeira, Sterling Heights, and Robert T. Ruffini, Southfield, all of Mich., assignors to Fluxtrol Manufacturing, Inc., Troy, Mich.

Continuation of Ser. No. 866,051, Apr. 8, 1992, Pat. No. 5,418,811. This application Feb. 15, 1995, Ser. No. 389,013

Int. Cl.[6] H05B *5/16*

U.S. Cl. 373—152 **19 Claims**



1. An induction heating apparatus operable for melting a workpiece, comprising:

a hollow crucible;

an induction melting coil wound to concentrically surrounding said crucible;

power source means operable for establishing an electromagnetic field within said induction melting coil, said electromagnetic field operable for inductively heating said workpiece disposed within said crucible;

support means for maintaining a predetermined spatial relationship between adjacent winding of said induction melting coil; and

insert means for substantially encapsulating said induction melting coil, said insert means made from a homogeneous material comprising powdered ferromagnetic material dispersed in a binder whose composition acts to concentrate said electromagnetic field with respect to said workpiece, said insert means generating a low reluctance path within which said electromagnetic field travels while concomitantly confining said electromagnetic field to inhibit inductive heating of auxiliary conductive materials located in close proximity to said induction melting coil.

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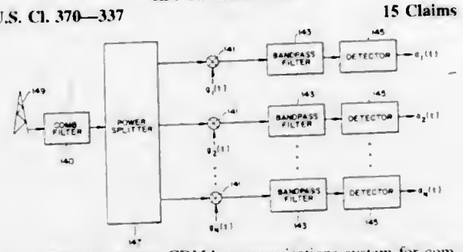
5,588,020
SPREAD SPECTRUM CDMA COMMUNICATIONS SYSTEM

Donald L. Schilling, Sands Point, N.Y., assignor to InterDigital Technology Corporation, Wilmington, Del.

Continuation of Ser. No. 622,235, Dec. 5, 1990, Pat. No. 5,351,269. This application Sep. 12, 1994, Ser. No. 304,650
Int. Cl.[6] H04L *9/00*
U.S. Cl. 370—337 **15 Claims**



1. A spread spectrum CDMA communications system for communicating data between a plurality of PCN units, said spread spectrum CDMA communications system located within a same geographical region as occupied by a mobile cellular system with each cell of the mobile cellular system having a cellular bandwidth divided into predetermined channels with guard bands between the predetermined channels, and having cellular-users communicating on the predetermined channels, said spread spectrum CDMA communications system comprising:

a plurality of PCN-base stations located within the mobile cellular system for communicating data to the plurality of PCN units, each of said plurality of PCN-base stations including,

a base modulator for converting the format of the data into a form suitable for communicating over radio waves;

a pseudorandom generator for generating a selected-chip code;

a product device coupled to said pseudorandom generator and to said base modulator, for spread spectrum processing the converted data from said base modulator with the selected-chip code; and

a transmitter coupled to said product device for transmitting across the cellular bandwidth, the spread-spectrum-processed-converted data to a PCN unit;

a plurality of PCN units, each of said plurality of PCN units including,

a PCN antenna; and

PCN detection means coupled to said PCN antenna and including PCN-spread-spectrum-processing means, for recovering the spread-spectrum-processed-converted data communicated from each of said plurality of PCN-base stations.

5,588,021
REPEATER FOR USE IN A CONTROL NETWORK

Mark A. Hunt, Derby, and Andrew Murray, Sutton Coldfield, both of United Kingdom, assignors to Light & Sound Design Limited, Edinburgh, United Kingdom

Filed Jun. 24, 1993, Ser. No. 80,717
Claims priority, application United Kingdom, Sep. 25, 1992, 9220308; Apr. 20, 1993, 9308069
Int. Cl.[6] H04B *17/02;1/38*
U.S. Cl. 375—211 **5 Claims**

1. A repeater for use in a control network comprising:

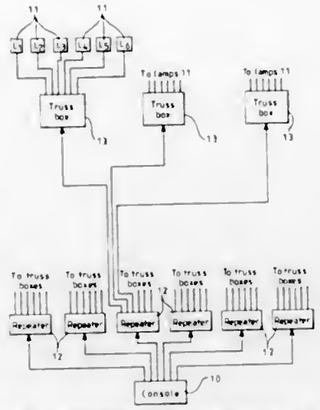
a root input/output isolating transformer,

a plurality of branch input/output isolating transformers,

a line receiver circuit,

line driver circuits coupled to said branch input/output isolating transformers,

common voltage detector means for detecting a common voltage at a root side of said root input/output isolating transformer,



common voltage applying means for applying to a branch side of each of the branch input/output isolating transformers a common mode voltage determined by said common voltage detector means,

normal data flow enabling means for enabling the line receiver circuit coupled to the root input/output isolating transformer and the line driver circuit directly connected to the branch input/output isolating transformers when a normal common mode voltage is detected, so that data signals received by the root input/output isolating transformer are transmitted from each of the branch input/output isolating transformers,

reverse data flow enabling means for enabling the line receivers coupled to the branch isolating input/output transformers when a different common mode voltage is detected,

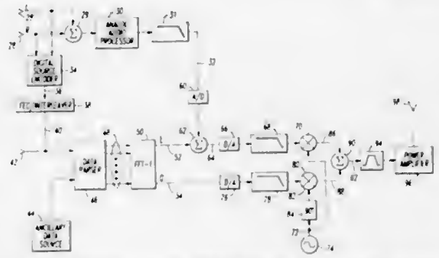
a data signal discriminating means, coupled to the line receiver circuits for detecting valid data signals at an output of any one of the line receiver circuits coupled to the branch input/output isolating transformers, and

means for enabling the line driver circuit coupled to said root input/output isolating transformer when such valid data signals are detected and for routing it to the output of the one of the line receiver circuits at which valid data signals have been detected.

5,588,022
METHOD AND APPARATUS FOR AM COMPATIBLE DIGITAL BROADCASTING

Mark J. Dapper, Cincinnati; Michael J. Geile, Loveland, and Barry W. Carlin, Greenhills, all of Ohio, assignors to Xetron Corp., Cincinnati, Ohio

Filed Mar. 7, 1994, Ser. No. 206,368
Int. Cl.[6] H04L *27/00;27/28;27/18;23/02*
U.S. Cl. 375—216 **25 Claims**



1. A radio frequency broadcasting method, said method comprising the steps of:

amplitude modulating a first carrier signal by an analog signal to generate a first radio frequency signal having a first frequency spectrum,

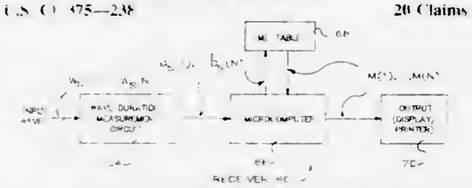
generating a plurality of digitally modulated carrier signals for broadcast, said signals being within a frequency range which encompasses the frequency spectrum of the first radio frequency signal, each of said digitally modulated carrier signals being digitally modulated by a portion of a digital signal, wherein a first group of said digitally modulated carrier signals overlap said first frequency spectrum and are modulated in-quadrature with said first carrier signal, and wherein second and third groups of said digitally modulated carrier signals lie outside of said first frequency spectrum and are modulated both in-phase and in-quadrature with said first carrier signal, and

simultaneously broadcasting said first radio frequency signal and said plurality of digitally modulated carrier signals.

5,588,023
HIGH CONTENT INFORMATION TRANSMISSION SYSTEM

Kit-Fai Ho, P.O. Box 54504, North Point, Hong Kong

Continuation of Ser. No. 268,797, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 853,480, Apr. 18, 1986, Pat. No. 4,809,299. This application Apr. 18, 1995, Ser. No. 423,126
Int. Cl.[6] H03K *7/08;9/08*
U.S. Cl. 375—238 **20 Claims**



1. A process for transmitting information comprising a series of message units selected from a set of more than two defined message units, said transmission process comprising the steps of:

(a) defining the message units comprising said set of defined message units,

(b) assigning a wavelet duration to each defined message unit,

(c) converting each of said defined message unit of the information to be transmitted into an alternate-state wavelet at a rate of one message unit per wavelet state, each of said defined message unit being a member of said set of defined message units, the duration of said alternate-state wavelet being varied for each of said defined message unit to conform to the wavelet duration defined for each of said defined messsage unit, successive converted wavelets corresponding to respective message units being contiguous and alternating,

(d) transmitting said converted wavelet, said information to be transmitted being transmitted as succeeding alternating wavelets;

(e) receiving said transmitted wavelet;

(f) determining a received wavelet duration of said received wavelet;

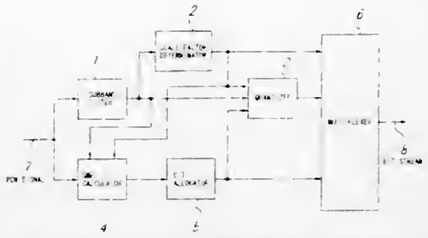
(g) deconverting said received wavelet duration to a message unit in accordance with the assigned wavelet duration, thereby to convey the information.

5,588,024
FREQUENCY SUBBAND ENCODING APPARATUS

Hideto Takano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 25, 1995, Ser. No. 533,100
Claims priority, application Japan, Sep. 26, 1994, 6-229889
Int. Cl.[6] H04B *14/04*
U.S. Cl. 375—242 **3 Claims**

1. A frequency subband encoding apparatus comprising:



a subband filter for dividing a digital audio signal into a plurality of frequency subbands,

a signal to mask level ratio calculator for calculating mask levels for the individual frequency subbands from the digital audio signal based on a psychoacoustic model, detecting signal levels of the individual frequency subbands from samples of the frequency subbands and outputting signal to mask level ratios which are ratios between the signal levels and the mask levels for the individual frequency subbands,

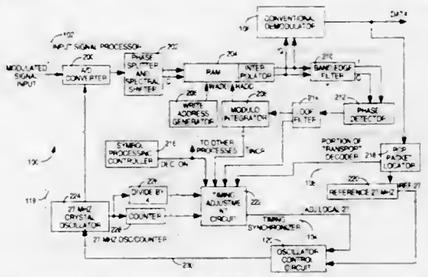
a bit allocator for determining a reference NMR which is a value obtained by subtracting from a signal to mask level ratio of the entire frequency band a signal to noise ratio calculated from a reference bit number to be allocated to one of the frequency subbands which exhibits a maximum signal to mask level ratio and adjusting the reference NMR to perform bit allocation, wherein said bit allocator temporarily allocates to those of the frequency subbands which have higher signal to mask level ratios than the reference NMR, bit numbers corresponding to differences between the signal to mask level ratios and the reference NMR and then adjusts the reference NMR to perform bit allocation repetitively until a remaining bit number after the temporary bit allocation exhibits a minimum value, and

a quantizer for quantizing samples of the individual frequency subbands with quantization step numbers calculated from bit allocation amounts to the individual frequency subbands.

5,588,025
SINGLE OSCILLATOR COMPRESSED DIGITAL INFORMATION RECEIVER

Christopher H. Strolle, Glenside, Pa.; Steven T. Jaffe, Freehold, and Paul W. Lyons, New Egypt, both of N.J., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Mar. 15, 1995, Ser. No. 406,216
Int. Cl.[6] H04L *27/06;27/14;27/22;7/00*
U.S. Cl. 375—316 **21 Claims**



1. A receiver for demodulating a packetized input signal containing encoded timing information, comprising:

an oscillator for generating a sampling signal;

digitizing means, connected to said oscillator, for digitizing the packetized input signal using the sampling signal;

interpolating means, connected to said digitizing means, for interpolating the digitized signal to produce an interpolated signal;

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a first timing loop, connected to said interpolating means, for synchronizing the interpolating means whereby channel symbols within the packetized input signal are optimally interpolated;

a demodulator, connected to said interpolating means, for demodulating the interpolated signal to produce a baseband signal;

a transport decoder, connected to said demodulator, for extracting said encoded timing information from said baseband signal;

a second timing loop, connected to said transport decoder and said oscillator, for synchronizing the sampling signal to the extracted timing information; and

decoder means, connected to said transport decoder, for decoding information contained in said baseband signal to generate a decoded signal.

5,588,026

METHOD OF COMPENSATING PHASE SHIFT KEYING FREQUENCY OFFSET

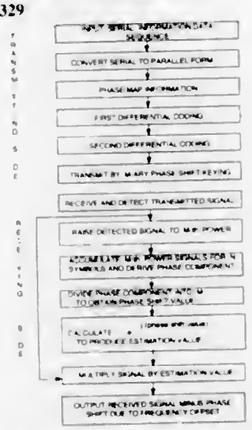
Hiroyasu Ishikawa, Tokyo, and Hideo Kobayashi, Saitama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 66,242, May 25, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 361,707

Claims priority, application Japan, Jun. 4, 1992, 4-168217

Int. Cl.[6] H03D *3/00*

U.S. Cl. 375—329 **4 Claims**



1. A method of communication including a method of compensating frequency offset in a digital mobile communication system having a differential detection scheme as a demodulation method for demodulating a received digital phase shift keying signal having information encoded in M information phases wherein M is equal to 2^N (N is an integer larger than zero) to produce a detected signal, said method comprising the steps of:

detecting said received digital phase shift signal;

raising the detected digital signal to M-th power (M is the number of information phases) producing M-th power signals to remove a modulation factor from said received signal;

accumulating the M-th power signals for N symbols and deriving a phase component of the accumulated M-th power signal;

dividing the derived phase component into M so as to obtain an estimation value with respect to phase shift due to the frequency offset which represents frequency deviation from a true carrier frequency contained in the received signal;

multiplying the received signal by the obtained estimation value in a form of a conjugate complex number to remove phase shift due to frequency offset from the received signal; and

demodulating the resultant signal and providing said digital phase shift keying signal to an output device from which keyed information therein can be retrieved.

5,588,027

DIGITAL DEMODULATING METHOD AND CIRCUIT FOR USE IN A TIME-DIVISION MULTIPLE ACCESS CHANNEL

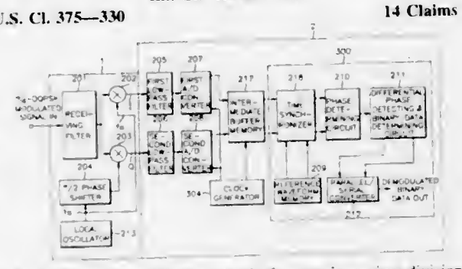
Moo-Gil Lim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1993, Ser. No. 176,451

Claims priority, application Rep. of Korea, Jan. 30, 1993, 1245/1993

Int. Cl.[6] H04L *27/22*

U.S. Cl. 375—330 **14 Claims**



4. A digital demodulating circuit for use in a time-division multiple access channel, having a radio frequency processing circuit for filtering a $\pi/4$-differentially quadrature phase shift keying (DQPSK) modulated signal, converting the filtered signal to base band I channel and a Q channel signal components, said digital demodulating circuit comprising:

first and second low-pass filters for low-pass filtering said I channel and Q channel signal components, respectively;

first and second analog/digital converters for oversampling respective filtered analog signals output from said first and second low-pass filters to generate respective I and Q channel data, wherein said I and Q channel data include a plurality of data sets;

an intermediate buffer memory for temporarily storing said I and Q channel data,

a clock generator for providing a clock for use in oversampling of said first and second analog/digital converters and for controlling write speed of said intermediate buffer memory;

a reference waveform memory for storing data representative of a reference training modulation signal;

a time synchronizer for calculating complex correlation function values between I and O channel data for each of said plurality of data sets stored in said intermediate buffer memory and said data representative of a reference training modulation signal stored in said reference waveform memory, detecting a maximum peak value within a time slot of the calculated complex correlation function values, and generating a signal indicative of a selected one of said data sets of the I and Q channel data stored in said intermediate buffer memory, said selected data set corresponding to said maximum peak value;

a phase determining circuit for determining the phase of the signal generated by said time synchronizer every predetermined time period;

a differential phase detecting and binary data determining circuit for detecting a phase difference according to the phase determined from said phase determining circuit and determining binary data adapted for a $\pi/4$-differentially quadrature phase shift keying (DQPSK) modulation characteristic according to the detected phase difference; and

a parallel/serial converter for converting binary data output from said differential phase detecting and data determining circuit

into serial data to generate a differential phase value by the unit of 2 bits.

5,588,028

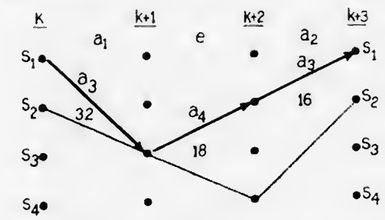
SIMPLIFIED TRELLIS DECODER

Vladimir Parizhsky, Chicago, Ill., assignor to U.S. Robotics, Skokie, Ill.

Continuation of Ser. No. 299,888, Sep. 1, 1994, abandoned, which is a continuation of Ser. No. 12,525, Feb. 2, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,723

Int. Cl.[6] H04L *27/22*

U.S. Cl. 375—341 **11 Claims**



1. A method of translating signal values received over an error-prone communications channel into a replica of an original transmitted sequence of symbol values, each transmitted symbol value in said original transmitted sequence being selected from a predetermined alphabet of symbol values, each transmitted symbol value being representative of a transition between two of plural possible process states as defined by a coding scheme in which only selected state-to-state transitions are allowed and each of said allowed transitions is uniquely represented by one of said symbol, values said method comprising, in combination, the steps of:

deriving and storing a path metric value associated with each given one of said plural process states by performing, for each such given state, the substeps comprising, in combination:

selecting a limited number of candidate transitions, said limited number being less than all possible valid transitions, said step of selecting the limited number of candidate transitions comprised of

selecting, as first candidate transitions from those allowed transitions which terminate at said given state, those transitions which originated from a predecessor state associated with the most favorable previously stored path metric value,

producing, for each given one of said allowed transitions, a branch metric value representing the difference between the value of the symbol representing said one allowed transition and the value of the corresponding symbol in said sequence as received over said channel,

selecting, as second candidate transitions, those transitions having the most favorable branch metric value,

calculating for each of said first and second candidate transitions the combined value of said branch metric value and the path metric value previously stored for the state at which said transition originated,

comparing said combined values to select that candidate transitions having the most favorable combined value,

saving said most favorable combined value as the new path metric for said given state, and

saving an identification of the selected candidate transition having the most favorable combined value; and

sequentially tracing a connected chain of a plurality of said selected transitions from a current one of states to produce a decoded output symbol corresponding to a prior transition in said chain.

5,588,029

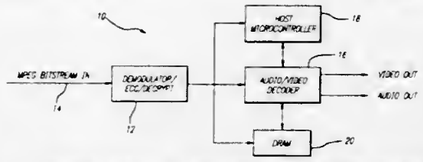
MPEG AUDIO SYNCHRONIZATION SYSTEM USING SUBFRAME SKIP AND REPEAT

Greg Maturi, Tracy, and Gregg Dierke, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jan. 20, 1995, Ser. No. 375,951

Int. Cl.[6] H04L *7/06*

U.S. Cl. 375—364 **22 Claims**



1. A decoding system for decoding a data stream including frames of encoded data, each frame including a plurality of subframes of integrally encoded data, comprising:

decoding means for decoding said subframes; and

synchronization means for controlling the decoding means to skip a subframe if a predetermined decoding time for said subframe is earlier than a current time; and to repeat said subframe if said predetermined decoding time is later than said current time.

5,588,030

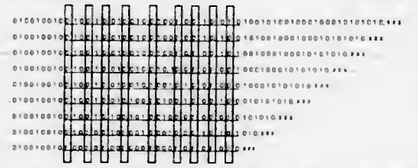
APPARATUS AND METHOD FOR THE SYNCHRONIZATION OF DATA IN A BIT STREAM

C. M. Riggle, Colorado Springs, and Marvin DeForest, Longmont, both of Colo., assignors to Maxtor Corporation, Longmont, Colo.

Continuation of Ser. No. 135,072, Oct. 13, 1993. This application Jan. 11, 1996, Ser. No. 585,260

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—368 **17 Claims**



1. A method for detecting the beginning of data in a bit stream, wherein the bit stream comprises sequences of a preamble, byte synch and data, wherein the byte synch comprises an EOP bit sequence which identifies the end of the preamble and the beginning of the data, said method comprising the steps of:

determining a frequency and phase related to the bit stream for clock synchronization;

wherein said step of determining is completed within an initial portion of a pattern of bits in the preamble, said pattern being a repetition of instances of a specific bit string having a bit with a first value and one or more bits having a different second value;

performing EOP searches to detect a first occurrence of said EOP bit sequence in said bit stream, wherein at least one of said EOP searches commences at a first bit position within said bit stream, said first bit position separated by a second bit position from a third bit position at which a next EOP search is commenced, wherein no EOP search commences at said second bit position; and

determining where the data begins in the bit stream using an EOP bit sequence detected in one of said EOP searches;

wherein said step of performing EOP searches allows an EOP bit sequence to be used which is shorter than a bit sequence which would be required if an EOP search were commenced at said second bit position.

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5,588,031

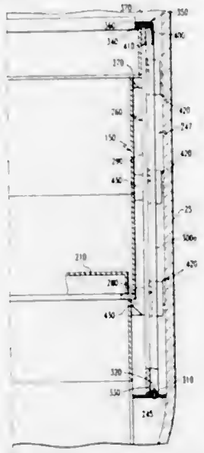
APPARATUS FOR REINFORCING A REACTOR VESSEL CORE SHROUD

Bruce W. Bevilacqua, Export; Louis J. Malandra, McKeesport; Robert E. Meuschke, Monroeville, and Alex W. Harkness, Gibsonia, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1994, Ser. No. 330,058

Int. Cl.[6] G21C *9/00*

U.S. Cl. 376—287 **3 Claims**



1. An apparatus, which reinforces a core shroud that is contained within a reactor vessel, operable in the event of cracking or events of similar magnitude in the core shroud, the apparatus comprising:

(a) a rector vessel wall positioned surrounding the shroud;

(b) a plurality of beams positioned generally axially and in a spaced apart relationship with each other around the shroud, each beam attached to the shroud for absorbing the forces generated in the shroud, each beam having a generally U-shaped cross section for allowing easy installation of each said radial support, and each beam having a support shelf positioned in its interior; and

(c) a plurality of radial supports positioned between each said beam and said reactor vessel wall for transmitting any forces absorbed by each said beam to said reactor vessel wall which, in effect, reduces the loads in each said beam and also maintains generally uniform distribution of the loads absorbed by each said beam for allowing each said beam to efficiently absorb the generated forces, each said radial support including a mating portion which attaches to the beam shelf for assisting in transmitting the absorbed forces in said beam to the wall.

5,588,032

APPARATUS AND METHOD FOR IMAGING WITH WAVEFIELDS USING INVERSE SCATTERING TECHNIQUES

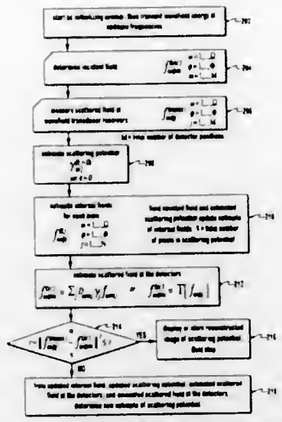
Steven A. Johnson, 1916 E. Browning Ave., Salt Lake City, Utah 84108; James W. Wiskin, 1021 Medical Towers, Salt Lake City, Utah 84112; David T. Borup, 1133 E. Sunnyside Ave., Salt Lake City, Utah 84103; Douglas A. Christensen, 8520 S. Top of the World Cir., Salt Lake City, Utah 84121, and Frank Stenger, 680 Ter. Hills Dr., Salt Lake City, Utah 84103

Filed Oct. 14, 1992, Ser. No. 961,768

Int. Cl.[6] G01N *23/201;* **G01V** *1/00*

U.S. Cl. 378—8 **120 Claims**

107. A method of producing an image of an object from wavefield energy that has been transmitted into and scattered by the object, said image comprising a high resolution map of the scattering potential at all points within the object, said image being stored in a memory of a central processing unit (CPU), and said method comprising the steps of:



(a) electronically transmitting an electric signal at one or more frequencies and transducing said electric signal at each said frequency into wavefield energy propagated toward said object from one or more of antennae transmitter positions;

(b) electronically processing said electric signal to determine an incident field corresponding to said propagated wavefield energy, said incident field being stored in the memory of the CPU in the form of digitized electric signals;

(c) detecting at one or more of antennae receiver positions said wavefield energy transmitted into and scattered by said object;

(d) electronically processing said detected wavefield energy so as to transform said detected wavefield energy into one or more digitized electric signals stored in said memory of said CPU and corresponding to a scattered field detected at said one or more antennae receiver positions;

(e) said CPU setting an initialized estimate of the scattering potential for said object at each said frequency and storing each said scattering potential estimate in said memory: and

(f) said CPU computing an updated scattering potential from said incident field and said scattered field detected.

5,588,033

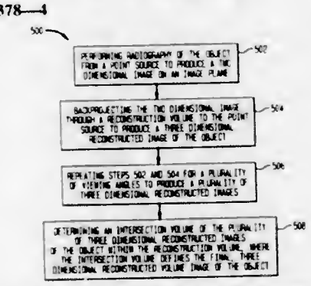
METHOD AND APPARATUS FOR THREE DIMENSIONAL IMAGE RECONSTRUCTION FROM MULTIPLE STEREOTACTIC OR ISOCENTRIC BACKPROJECTIONS

Kah T. D. Yeung, Cordova, Tenn., assignor to St. Jude Children's Research Hospital, Memphis, Tenn.

Filed Jun. 6, 1995, Ser. No. 466,829

Int. Cl.[6] G01N *23/083*

U.S. Cl. 378—4 **16 Claims**



1. A method for reconstructing a three dimensional image of an object from a plurality of radiographic images, comprising the steps of:

backprojecting each radiographic image through a reconstruction volume to produce a plurality of corresponding backprojected images; and

determining an intersection of said plurality of backprojected images in said reconstruction volume, said intersection defining a three dimensional, reconstructed image of the object.

5,588,034

APPARATUS AND METHOD FOR INSPECTING A CRYSTAL

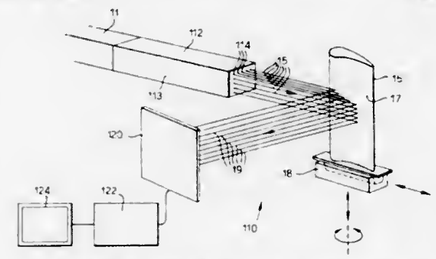
David K. Bowen, and Charles R. Thomas, both of Warwickshire, England, assignors to Rolls-Royce PLC, London, and University of Warwick, Coventry, both of England

Filed Apr. 21, 1995, Ser. No. 426,602

Claims priority, application United Kingdom, Apr. 22, 1994, 9408012

Int. Cl.[6] G01N *23/207*

U.S. Cl. 378—73 **23 Claims**



1. An apparatus for detecting defects in a crystal comprising

a specimen holder arranged to hold a crystal,

a polychromatic x-ray generator arranged to produce a beam of polychromatic x-rays,

a collimator arranged to receive the beam of polychromatic x-rays from the polychromatic x-ray generator, the collimator having means to produce a plurality of separate parallel polychromatic x-ray beams in a predetermined pattern and to direct the plurality of separate parallel polychromatic x-ray beams in the predetermined pattern onto the surface layers of the crystal,

an x-ray detector arranged to detect at least one separate diffracted x-ray beam diffracted by the surface layers of the crystal, each of the separate diffracted x-ray beams corresponding to a respective one of the plurality of separate parallel polychromatic x-ray beams directed onto the surface layers of the crystal, the x-ray detector determining whether any of the separate diffracted x-ray beams have been displaced from the predetermined pattern to indicate that there is a defect in the surface layers of the crystal.

5,588,035

X-RAY TUBE NOISE AND VIBRATION REDUCTION

Paul G. Christean, and Dennis H. Runnoe, both of Salt Lake City, Utah, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 17, 1995, Ser. No. 503,114

Int. Cl.[6] H01J *35/20*

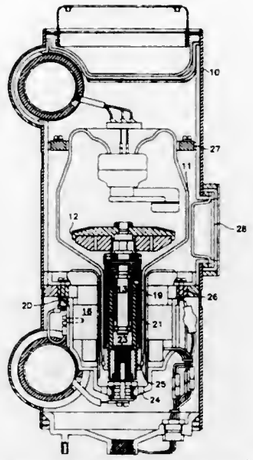
U.S. Cl. 378—132 **16 Claims**

1. An X-ray tube comprising:

a housing;

a vacuum envelope disposed within said housing, said vacuum envelope comprising a head portion and a neck portion;

an anode assembly disposed within said vacuum envelope and extending through said head and neck portion, said anode assembly comprising a rotatable target, a shaft mounted to said target, said shaft extending inwardly along a tube axis, a rotor mounted to said shaft for rotation said anode assembly about said axis at a predetermined speed;



a bearing and support structure, said anode assembly mounted to said bearing and support structure;

a cathode assembly disposed within said head portion in proximity to said anode assembly for generating and focusing a beam of electrons onto said target for producing X-rays;

a high voltage source for maintaining a potential between said rotating anode and said cathode assembly; and

a flexible isolating member disposed between said neck portion of said vacuum envelope and said bearing and support structure along said tube axis for providing independent respective movement for said vacuum envelope and said bearing and support structure to prevent transmission of the vibrational energy from said anode assembly to said vacuum envelope, said flexible isolating member being integral with said vacuum envelope.

5,588,036

X-RAY CT APPARATUS AND RADIOGRAPHING METHOD USING SAME

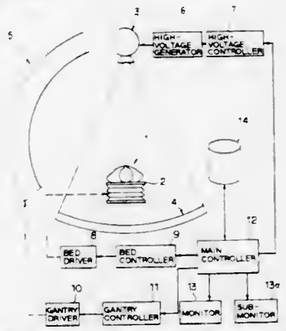
Masakuni Fujise, Otawara, and Hiroshi Ishikawa, Mitaka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 266,631, Jun. 28, 1994, abandoned. This application Feb. 15, 1996, Ser. No. 601,967

Claims priority, application Japan, Jun. 28, 1993, 5-157470

Int. Cl.[6] G21K *5/10*

U.S. Cl. 378—146 **18 Claims**



1. An X-ray CT apparatus for performing a scanning operation on an examined region of a patient lying on a bed, in which an

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X-ray from an X-ray tube irradiating the patient passes through the patient and is detected by a detecting means, the X-ray CT apparatus comprising:

a scan condition file means into which past scan condition including a predetermined scan pitch and a predetermined slicing width for patients to be scanned are stored the past scan condition being acquired by means of previously performing at least one scanning operation on the examined region of the patient;

means for individually designating a specific one of the patients;

means for reading out the past scan condition of the designated specific one of the patient from the scan condition file means; and

a main controller for setting a scan condition in accordance with the past scan condition of the examined region of the designated patient and for performing the scanning operation on the examined region of the designated patient in accordance with the set scan condition.

5,588,037

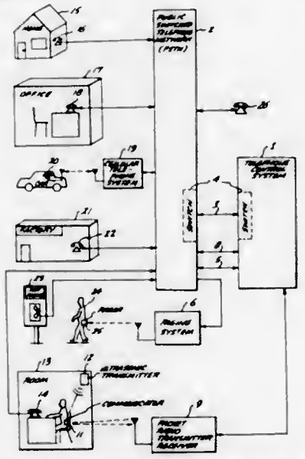
REMOTE ACCESS TELEPHONE CONTROL SYSTEM

Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Accessline Technologies, Inc., Bellevue, Wash.

Division of Ser. No. 249,453, May 26, 1994, which is a division of Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Jul. 8, 1994, Ser. No. 273,008

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—57 **55 Claims**



1. A control system for connection to a telephone network, said network including at least one telephone switch which is capable of connecting a plurality of telephone lines such that a plurality of parties can simultaneously be in telephone contact with other parties at the same time via said switch, said control system receiving and processing calls from callers to users, the control system comprising: input/output means for connection to telephone network lines to input and output telephone calls; switch control means for controlling said at least one switch to connect a call on one line to a different line; memory means for controllably storing and recalling electronic signals; and electronic processing means for accessing said memory means and said switch control means to direct the flow of input and output calls, said electronic processing means including means for:

a) processing calls to the system directed to a user in a selected one of at least two distinct programmable modes, one such mode being call forwarding in which case the processing means proceeds with functions b) through c),

b) recalling from said memory means a forwarding number for said user,

c) causing said switch control means to switch the caller's call in said switch to said forwarding number,

d) monitoring a call to said system from said user, including during calls made by said user via said control system to one or more third parties,

e) in response to the user transmitting a predetermined command while the call is being monitored, placing the user's call in a control mode wherein user may enter commands to change a users call processing mode.

5,588,038

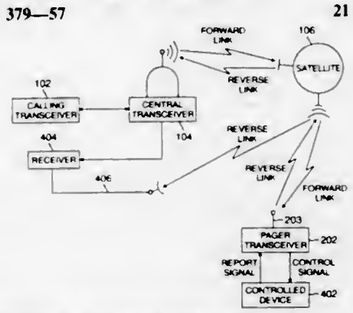
SYSTEM AND METHOD FOR SIGNALING A DEVICE AT A REMOTE LOCATION OVER A WIRELESS NETWORK

Bernard M. Snyder, San Diego, Calif., assignor to J.F.A. Tech., Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 154,818, Nov. 19, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 349,548

Int. Cl.[6] H04Q *7/12*

U.S. Cl. 379—57 **21 Claims**



1. A system for remotely stopping a vehicle theft, comprising:

a transmitter for generating a calling code and a predetermined security code;

a central switching unit for receiving said calling code and said predetermined security code and for generating a forward wireless communication including said calling code and said predetermined security code;

a satellite for receiving and transmitting said forward wireless communication;

a pager transceiver, located in a vehicle, for receiving said wireless communication and for transmitting a reverse wireless communication, wherein said pager unit is responsive to said calling code and generates a first signal in response to receiving said predetermined security code;

a tripping circuit, responsive to said first signal and located in said vehicle, for generating a second signal; and

a switch, responsive to said second signal and located in said vehicle, for disabling said vehicle;

wherein said pager transceiver is a digital transceiver that receives and sends only low-power short digital data packets and that cannot receive digital and analog voice transmissions;

wherein said reverse wireless communication can be relayed through said satellite to said central switching unit.

5,588,039

MOBILE COMMUNICATION SYSTEM CAPABLE OF AVOIDING LOCAL CONGESTION

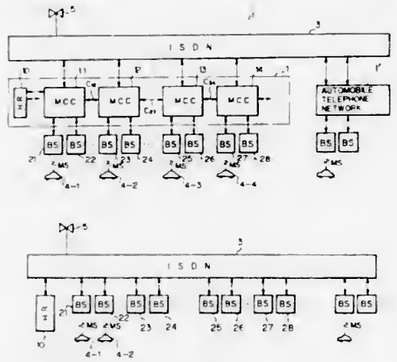
Kazuko Ohkubo, and Masahiko Yahagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 258,815

Claims priority, application Japan, Jun. 15, 1993, 5-143695

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 379—58 **2 Claims**



1. A mobile communication system comprising:

an integrated service digital network (ISDN);

a plurality of mobile base stations directly connected to said ISDN as subscribers of said ISDN, each of said mobile base stations comprising means for receiving a call request with a destination subscriber number from one of a plurality of mobile stations, and means for transmitting to said ISDN a call information signal including an identification of said one of said mobile stations and the destination subscriber number;

a home memory station, directly connected to said ISDN as a subscriber of said ISDN, for storing update location information of said plurality of mobile stations with respect to said mobile base stations, said home memory station comprising:

(i) means for receiving said call information signal and for searching the stored update location information to determine to which mobile base stations the destination subscriber number belongs, and

(ii) means for returning an information signal including an ISDN subscriber number of at least one of said mobile base stations to which the destination subscriber number belongs and an identification number of the destination subscriber number via said ISDN to said one of said mobile base stations.

wherein each of said mobile base stations further comprises:

(i) means for receiving said information signal and for establishing a call connection to at least one of said mobile base stations, without passing through said home memory station, based on the ISDN subscriber number thereof, and

(ii) means for calling one of said mobile stations having the identification number of the destination subscriber number.

5,588,040

Patent Not Issued For This Number

5,588,041

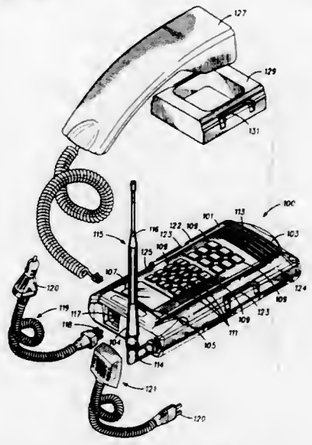
CELLULAR SPEAKERPHONE AND METHOD OF OPERATION THEREOF

George W. Meyer, Jr., Buffalo Grove; Allen Wong, Streamwood; John H. Spears, McHenry; David L. Bond, Hoffman Estates, and Thomas F. Vondrak, Libertyville, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1995, Ser. No. 369,021

Int. Cl.[6] H04Q *7/32*

U.S. Cl. 379—59 **15 Claims**



1. A portable cellular speakerphone comprising:

a housing;

a transceiver circuit disposed within said housing;

a processor and switching circuit disposed in said housing and coupled to said transceiver circuit for controlling said transceiver circuit;

a coupler carried on said housing and coupled to said processor and switching circuit for communicating with an optional handset; and

a hands-free user interface disposed within said housing and coupled to said processor and switching circuit, said hands-free user interface including a first microphone and a first speaker for operating the portable cellular speakerphone in a default hands-free mode, said processor and switching circuit coupling said hands-free user interface to said transceiver circuit in a default hands-free mode, and said processor and switching circuit responsive to detecting an activation indication signal from an optional handset coupled to said coupler to automatically interrupt the default hands-free mode to permit the portable cellular speakerphone to operate in a handset mode.

5,588,042

INTERACTIVE ROAMER CONTACT SYSTEM FOR CELLULAR MOBILE RADIOTELEPHONE NETWORK FOR AUTOMATICALLY INITIATING A COMMUNICATION WITH AN AUTONOMOUSLY REGISTERING CELLULAR MOBILE RADIOTELEPHONE

Edward I. Comer, Marietta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Continuation of Ser. No. 647,719, Jan. 28, 1991. This application Jun. 6, 1995, Ser. No. 468,794

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 379—59 **120 Claims**

1. In or for a cellular mobile radiotelephone (CMR) system, an automated customer class identification and contacting system, comprising:

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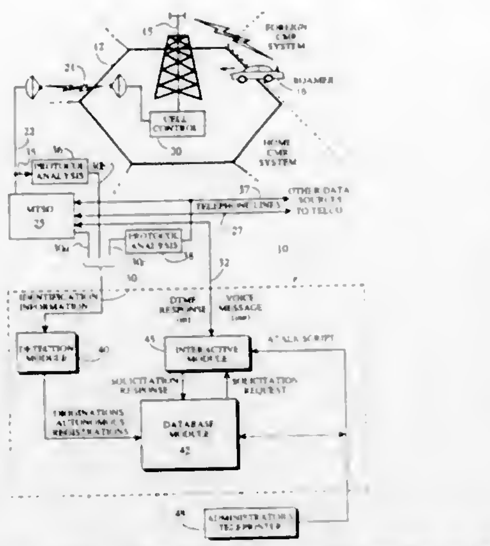


means for monitoring identification information provided by an autonomously registering mobile radiotelephone as it autonomously registers into said CMR system by powering up or entering an area of coverage of a cell of said CMR system;

means responsive to said identification information for detecting predetermined identifying characteristics of said autonomously registering mobile radiotelephone; and

communicating means responsive to detection of a selected predetermined identifying characteristic of said autonomously registering mobile radiotelephone for initiating a voice channel communication with a selected autonomously registering mobile radiotelephone having said selected predetermined identifying characteristic.

5,588,043

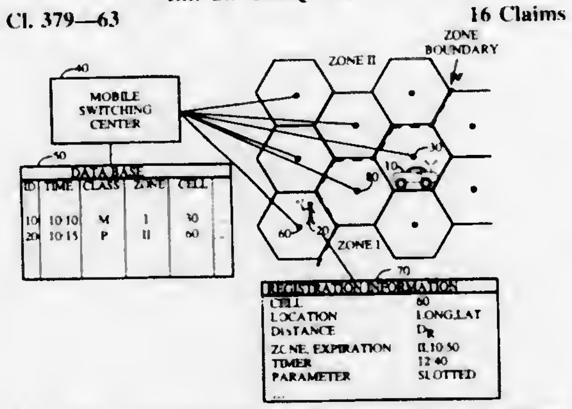
COMPREHENSIVE MOBILE COMMUNICATIONS DEVICE REGISTRATION METHOD

Edward G. Tiedemann, Jr.; Gadi Karmi, and Frank Quick, all of San Diego, Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 370,771, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 26,899, Mar. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 763,091, Sep. 20, 1991, Pat. No. 5,289,527. This application Feb. 16, 1996, Ser. No. 602,683

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 379—63 **16 Claims**



1. In a cellular communication system having a plurality of base stations, each of said plurality of base stations having a corresponding coverage area, in which a mobile station initially registers through a first base station with a system controller so that a message for said mobile station from said system controller may be communicated to said mobile station through at least one of said base stations in a predetermined manner, a method of registration comprising the steps of:

changing at said mobile station, during a time when active communication between said system controller and said mobile station is not established, a parameter which effects said predetermined manner of communication; and

registering said parameter via a radio frequency signal generated by said mobile station and transmitted to a base station corresponding to a coverage area in which said mobile station is currently located, wherein said parameter which effects said predetermined manner of communication is a slot cycle of said mobile station;

receiving at said mobile station location information from said first base station;

receiving at said mobile station location information from a second base station;

computing a distance between said second base station and said first base station; and

registering by said mobile station through said second base station if said computed distance exceeds a threshold.

5,588,044

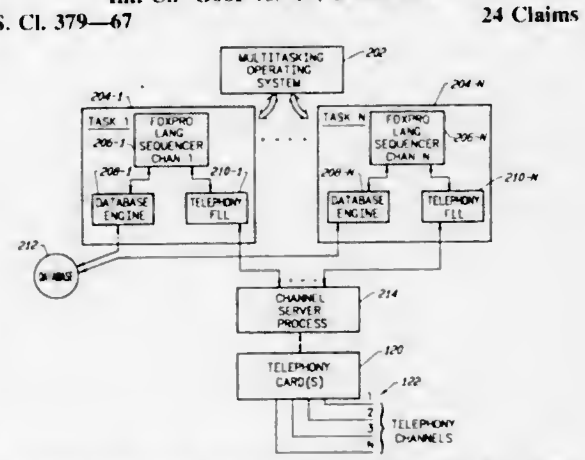
VOICE RESPONSE SYSTEM WITH PROGRAMMING LANGUAGE EXTENSION

Dan M. Lofgren, Milpitas, and William A. Dietrich, Sunnyvale, both of Calif., assignors to Voysys Corporatinn, Fremont, Calif.

Filed Nov. 22, 1994, Ser. No. 343,721

Int. Cl.^{6} G06F *15/419;* **H04M** *1/64*

U.S. Cl. 379—67 **24 Claims**



1. Telephony server apparatus, for use with a plurality of telephony channels, comprising:

a processor structure;

channel control hardware coupled to said telephony channels and to said processor structure; and

a memory structure having stored therein a plurality of channel programs each associated with a respective one of said telephony channels, multi-tasking operating system software instructions executable by said processor structure, database engine software instructions executable by said processor structure under a different task of said operating system for each of said telephony channels, and a database,

said database engine software instructions including instructions which, when executing under a given task of said operating system, interpret the channel program associated with the telephony channel of said given task and perform both database and telephony operations in response to such channel program associated with the telephony channel of said given task, said database operations including at least one operation from the group consisting of reading data from and writing data to said database, and said telephony operations including at least one operation from the group consisting of speaking a predefined prompt onto the telephony channel associated with the given task, receiving and storing DTMF-encoded input from the telephony channel associated with the given task, and recording audio input from the telephony channel associated with the given task.

5,588,045

VOICE/DATA TRANSFER METHOD AND APPARATUS UTILIZING AN ALTERNATE LINE

Michael L. Locke, Santa Clara, Calif., assignor to Siemens Rolm Communications Inc., Santa Clara, Calif.

Filed Feb. 3, 1995, Ser. No. 383,031

Int. Cl.^{6} H04M [illegible]

U.S. Cl. 379—67 **15 Claims**

1. An apparatus for transferring a call from a first port of an application processor of a telephone switch having an alternate line to a second port of the application processor, comprising:

means for seizing the second port;

means for detecting dialtone at the second port;

means for confirming the detection of dialtone to the first port;

means for initiating a transfer of the call to the alternate line; and

means for transferring the call to the second port, wherein said alternate line is configured such that said alternate line will not go off-hook prior to said call being connected to said second port.

5,588,046

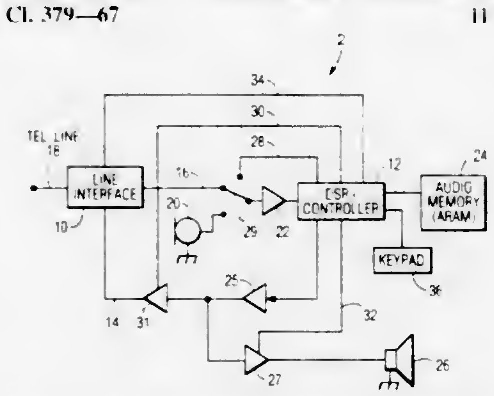
DIGITAL TELEPHONE ANSWERING DEVICE AND METHOD OF TESTING MESSAGE STORAGE MEMORY THEREIN

Stephen B. Knuth, Mission Viejo; Santoro M. Brown III, Cardiff by the Sea; and Mark [illegible] Karnowski, Westminster, all of Calif., assignors to Casio PhoneMate, Inc., Torrance, Calif.

Filed Oct. 23, 1995, Ser. No. 546,810

Int. Cl.^{6} G11C *11/34; 29/00;* **G06F** *11/00;* **H04M** *1/64*

U.S. Cl. 379—67 **11 Claims**



1. A method for testing a storage memory in a digital telephone answering device, the method comprising the steps of:

performing an initial test of only a predetermined portion of said memory, said predetermined portion of said memory having a size sufficient to store a first user input of information required to perform a basic telephone answering device function, said initial test being performed immediately after power is supplied to said device, without testing a remainder of said memory;

thereafter performing a continuous repetitive series of tests on at least said remainder of said memory while waiting for subsequent user inputs of information relating to any telephone answering device function, said continuous repetitive series of tests being performed to identify failed sections of said memory;

marking said identified failed sections of said memory;

processing said subsequent user inputs when such subsequent user inputs occur;

stopping performance of said continuous repetitive series of tests simultaneously with said processing of said subsequent user inputs; and

returning to said step of performing said continuous repetitive series of tests after completion of said processing of said subsequent user inputs.

5,588,047

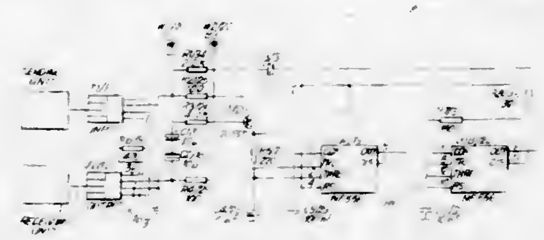
INTERFACE FOR SIMULATING A TELEPHONE LINE CONNECTION BETWEEN TWO DEVICES FOR ESTABLISHING A COMMUNICATION PATH BETWEEN THE DEVICES

Lars Rosengren, Huskvarna, and Ingemar Emricsson, Jonkoping, both of Sweden, assignors to Rosengren Teknik AB, Huskvarna, Sweden

Filed Feb. 2, 1995, Ser. No. 12,52[illegible]

Int. Cl.^{6} H04M [illegible]

U.S. Cl. 379—100 **16 Claims**



1. A circuit connected between a transmitting device and a receiving device which are disposed in close proximity to each other for simulating a telephone ring signal provided to the transmitting device to facilitate the transmission of data from the transmitting device to the receiving device, said circuit comprising:

an input terminal for connection to the transmitting device;

sensing means connected to said input terminal for sensing when transmission of data from the transmitting device is imminent;

an output terminal for connection to the receiving device, said output terminal being connected to said input terminal for providing a transmission path for data from said input terminal;

a voltage terminal connected to said input and output terminals for providing a transmission voltage to the transmitting and receiving devices during the transmission of data;

a telephone ring generator circuit connected to said sensing means for generating, for a preset time duration, a signal representative of a telephone ring when imminent transmission of data is sensed by said sensing means, said signal being provided to said input terminal during said preset time duration;

a timing circuit powered by said voltage terminal and connected to said ring generator circuit for instructing said ring generator circuit when to cease generating said representative ring signal; and

switching means connected between said voltage terminal and said timing circuit for providing voltage from said voltage terminal to said timing circuit when said sensing means senses that transmission of data from the transmitting device is imminent.

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5,588,048

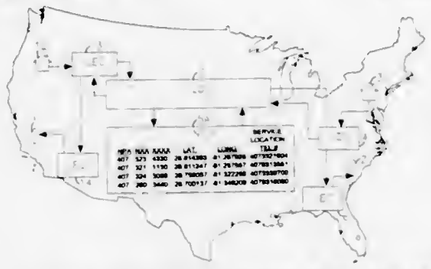
GEOGRAPHICALLY MAPPED TELEPHONE ROUTING METHOD AND SYSTEM

Daniel E. Neville, Orlando, Fla., assignor to 800 Adept, Inc., Altamonte Springs, Fla.

Continuation of Ser. No. 389,547, Feb. 15, 1995, abandoned, which is a continuation of Ser. No. 922,793, Jul. 31, 1992, abandoned. This application Mar. 28, 1996, Ser. No. 623,051

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—127 **16 Claims**



1. A system for direct routing a telephone call from a first party who has an originating telephone number at a specific location defined by latitude and longitude coordinates who dials a telephone number including digits uniquely characteristic to a second party having a plurality of service locations, said system comprising:

means for allocating individual latitude and longitude coordinates to each originating telephone number of all potential first parties;

means for defining the boundaries of one or more geographical areas which can be of any size and shape according to predetermined criteria, each point along said boundaries being defined by latitude and longitude coordinates;

means for assigning to each originating telephone number of said potential first parties a telephone number of a service location of a second party that will receive calls originating from within the boundary of a geographic area defined by said means for defining in which the individual latitude and longitude coordinates of the specific location of each of said potential first parties lie;

means for determining the originating telephone number of the first party from which said telephone call is to be routed; and

direct routing means for direct routing said telephone call to a service location of the second party assigned to said originating telephone number of the first party by said means for assigning.

5,588,049

METHOD FOR THE AUTOMATIC INSERTION OF REMOVAL OF A CALLING NUMBER IDENTIFICATION (CNID) BLOCKING PREFIX FROM WITHIN A TELEPHONE NUMBER IN A PERSONAL COMPUTER BASED TELEPHONE MANAGEMENT SYSTEM

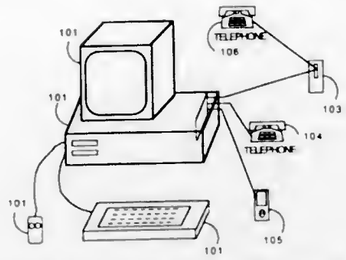
Greig R. Detering, 902 E. Marco Polo Rd., Phoenix, Ariz. 85024; Robert L. Gallick, 16220 N. 7th St., #3028, Phoenix, Ariz. 85022, and James F. Hewell, 19402 N. 73rd La., Glendale, Ariz. 85308

Filed Jan. 25, 1993, Ser. No. 8,027

Int. Cl.[6] H04M *1/56;3/00;1/66;7/00*

U.S. Cl. 379—142 **2 Claims**

1. A method for automatic insertion of a prefix code from within a telephone number, said telephone number being represented by a character string, said character string including a plurality of alphabetic characters and a plurality of numeric characters, a computer telephone management system for performing said method, said computer telephone management system being operated by a user, said user activating said prefix code through said computer telephone management system, said user defining a prefix code alias



and inserting said prefix code alias into said telephone number, said method comprising the steps of:

first removing extraneous characters from said character string of said telephone number;

translating said plurality of alphabetic characters in said telephone number to their corresponding plurality of numeric characters;

adding a predefined format information to said character string of said telephone number;

determining if said prefix code is activated by said user;

expanding a first occurrence of said prefix code alias in said character string of said telephone number to said prefix code if said step of determining determines that said prefix code is activated; and

second removing subsequent occurrences of said prefix code alias in said character string of said telephone number.

5,588,050

METHOD AND APPARATUS FOR PERFORMING COLOR CONVERSION

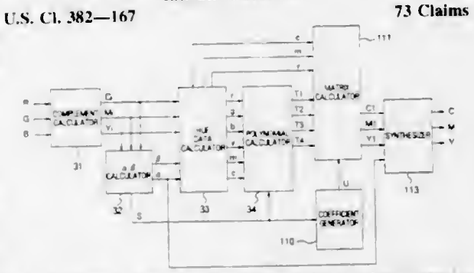
Shuichi Kagawa; Kazuhiro Chiba; Noriko Bamba, and Yoshiaki Okuno, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 292,012, Aug. 18, 1994, abandoned. This application Feb. 12, 1996, Ser. No. 600,204

Claims priority, application Japan, Aug. 27, 1993, 5-212781; Oct. 19, 1993, 5-260943; Jun. 10, 1994, 6-129003

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—167 **73 Claims**



1. An image processing method used by a color conversion apparatus for performing color conversion on first image data R, G and B expressed by three colors red, green and blue, to produce second image data C, M and Y expressed by three colors cyan, magenta and yellow, each of the first and second image data representing a pixel of one of a stationary image and a moving image, said method comprising the steps of:

(a) generating complementary color data Ci, Mi and Yi from the first image data R, G and B for each pixel of an image generated by one of a display device, image recording device, image reproducing device, and an information processing system;

(b) determining a minimum value α and a maximum value β of the complementary color data Ci, Mi, and Yi in accordance with the following expressions:

$\alpha = MIN\ (Ci, Mi, Yi)$

$\beta = MAX\ (Ci, Mi, Yi)$

(c) generating hue data r, g, b, y, m and c from the complementary color data Ci, Mi, and Yi, the minimum value α and the maximum β value, in accordance with the following equations:

$r = \beta - Ci$

$g = \beta - Mi$

$b = \beta - Yi$

$y = Yi - \alpha$

$m = Mi - \alpha$

$c = Ci - \alpha$

(d) generating predetermined matrix coefficients (Eij) and (Fij), with i=1 to 3 and j=1 to 3 for (Eij) and i=1 to 3 and j=1 to 12 for (Fij); and

(e) determining the second image data C, M, Y in accordance with a predetermined matrix calculation using the minimum value α, the hue data r, g, b, y, m and c, and the matrix coefficients (Eij) and (Fij).

5,588,051

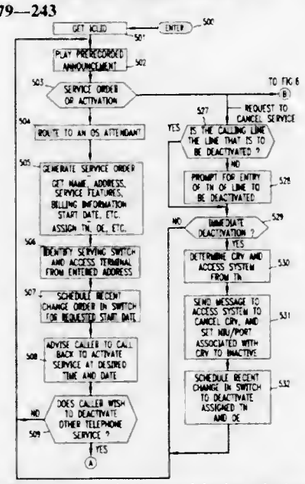
METHOD FOR DYNAMICALLY PROVISIONING TELEPHONE SERVICE

Gary M. Berkowitz, Morganville; Thomas H. Daugherty, Succasunna; Rand J. Edwards, Chester; S. Mark Klerer, Edison; Lyla R. Meader, Chatham Township, Morris County, all of N.J., and Cary A. Strohecker, Sr., Alpharetta, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 5, 1994, Ser. No. 318,413

Int. Cl.[6] H04M *3/00;5/18*

U.S. Cl. 379—243 **17 Claims**



13. A method of automatically provisioning telephone service in a telecommunications system comprising a plurality of switches and access systems, each of said access systems being operative for interfacing a plurality of telephone lines with a respective one of said switches, said telephone lines including subscribed and unsubscribed telephone lines, said method comprising the steps of

responsive to receipt of a call from a caller over a first one of said telephone lines and to said caller entering a request for telephone service, automatically prompting said caller to enter at least a street address associated with a second one of said telephone lines that is to identified with said requested telephone service,

identifying as a function of the entered address which one of said access systems and switches serve said second one of said telephone lines,

associating the requested service with a unique telephone number

scheduling a recent change order defining the requested service for execution in the identified switch at a date and time specified by the caller, said change order including said telephone number and a unique call reference value that are to be associated with said identified telephone line, and

activating the requested service at the specified date and time, and wherein said identified telephone line connects to said identified access system via a port circuit of an interface unit which interfaces said identified telephone line and other ones of said telephone lines with said identified access system and wherein said step of activating includes the steps of

prompting said caller to enter said unique telephone number and determining said unique reference value as a function of the entered telephone number, and

directing said access system to associate said call reference value with said port address to activate the requested service.

5,588,052

DTMF SIGNAL JUDGING APPARATUS

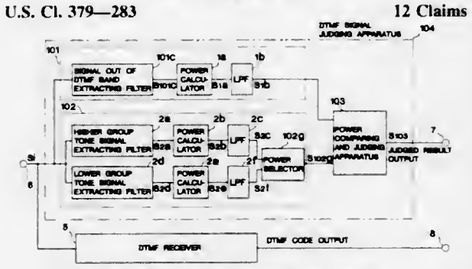
Yasumoto Murata, Nara-ken; Michio Ikeuchi; Shuichi Yoshikawa, both of Nara, and Masahiko Watanabe, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 978,742, Nov. 19, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 384,613

Claims priority, application Japan, Nov. 19, 1991, 3-303402; Dec. 27, 1991, 3-347312; Jan. 27, 1992, 4-012275; Feb. 10, 1992, 4-024108

Int. Cl.[6] H04M *1/515*

U.S. Cl. 379—283 **12 Claims**



1. A DTMF signal judging apparatus comprising:

first means for calculating power of a signal in a certain frequency band of an input signal, the input signal having a frequency band which includes frequencies inside a DTMF detection frequency band and outside the DTMF detection frequency band;

second means for extracting a signal having a frequency in the DTMF detection frequency band from the input signal, and for calculating power of the extracted signal; and

third means for performing an operation for the signals output from the first and second means, for comparing the operation result with a first predetermined threshold value, and for outputting the compared result.

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5,588,053

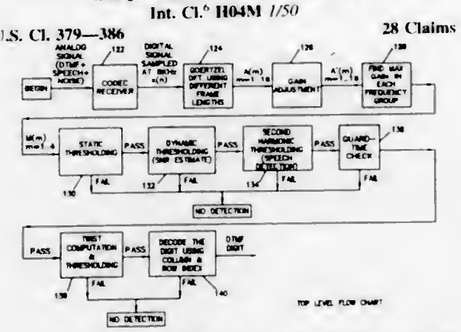
DTMF DETECTOR SYSTEM AND METHOD WHICH PERFORMS STATIC AND DYNAMIC THRESHOLDING

Zheng-yi Xie, Austin, Tex., assignor to Advanced Micro Devices, Sunnyvale, Calif.

Continuation of Ser. No. 563,973, Nov. 29, 1995. This application Jan. 11, 1996, Ser. No. 585,530

Int. Cl.[6] H04M *1/50*

U.S. Cl. 379—386 28 Claims



1. A method for detecting dual tone multifrequency (DTMF) signals which uses static and dynamic thresholding, comprising:

receiving a plurality of digital samples of a received signal, wherein said received signal includes a plurality of tones, wherein said plurality of tones comprise two or more tones from a plurality of different uncorrelated frequencies, wherein said plurality of different uncorrelated frequencies comprise two or more frequency groups;

determining energy values for each of said different uncorrelated frequencies comprising said two or more frequency groups;

determining a maximum energy value among said different uncorrelated frequencies for each of said two or more frequency groups;

comparing each of said maximum energy values for each of said two or more frequency groups with a first fixed value;

determining if each of said maximum energy values for each of said two or more frequency groups is greater than said first fixed value;

calculating a plurality of ratios of said maximum energy values with other energy values of said different uncorrelated frequencies from respective ones of said two or more frequency groups;

comparing each of said plurality of ratios with a second fixed value; and

determining if said calculated ratios are greater than said second fixed value.

5,588,054

POWER CONSERVATION SYSTEM FOR A MODEM IN A COMPUTER SYSTEM

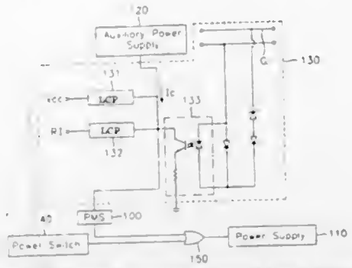
Seongkee Shin, and Sangho Lee, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 20, 1995, Ser. No. 425,530

Claims priority, application Rep. of Korea, Oct. 27, 1994, 94-27666

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—413 21 Claims



15. A power conservation system for a modem in a computer system having a primary power supply and an auxiliary power supply, comprising:

ring detect means coupled to a telephone ring signal line for generating a ring detect signal in response to detection of a ring signal on said telephone ring signal line, said ring detect means also being coupled to a power supply voltage to supply power to said ring detect means during a normal mode of operation;

power management means having an input coupled to said ring detect means and an output coupled to the primary power supply, said power management means being responsive to said ring detect signal for switching the primary power supply from a first level corresponding to a power conservation mode of operation of the computer system to a second level corresponding to said normal mode of operation; and,

wherein said auxiliary power supply is coupled to said ring detect means for supplying power to said ring detect means when the computer system is in said power conservation mode of operation, whereby said ring detect circuit is maintained in an active state even during said power conservation mode of operation of the computer system.

5,588,055

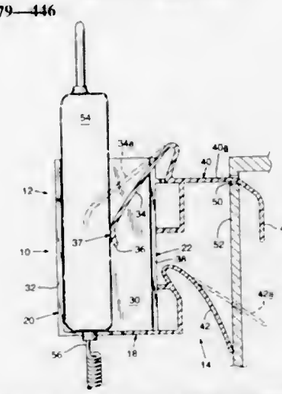
TELEPHONE HOLDER WITH MOUNTING ASSEMBLY

Robert Williamson, 7753 SE. Heather Ct., Milwaukie, Oreg. 97222; Alan Poole, 12685 SE. Sonoma, Clackamas, Oreg. 97015, and Michael S. Weinert, 5715 SE. 17th, Portland, Oreg. 97202

Continuation-in-part of Ser. No. 379,136, Jan. 27, 1995, abandoned. This application Jun. 3, 1996, Ser. No. 659,112

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—446 11 Claims



1. A telephone holder mounting assembly connected to a back wall of a telephone holder, wherein the mounting assembly is for mounting the holder to a top edge of a generally vertical surface, the mounting assembly comprising:

a hooking bracket for mounting over the top edge of the surface, wherein the bracket includes a rearwardly extending portion projecting from the back wall and a downwardly extending portion extending therefrom, and

a spring-biased buttress for stabilizing and leveling the holder against the surface by contacting and pushing against the surface, wherein the buttress is connected to the back wall and when not contacting the surface, the buttress is a substantially planar expanse which acutely extends rearwardly and downwardly away from the back wall and, when contacting the surface while the holder is mounted thereto, the buttress bends so that the buttress does not extend past a plane defined by the vertical surface.

5,588,056

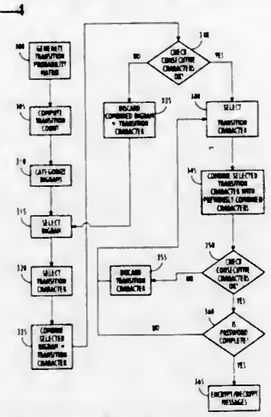
METHOD AND SYSTEM FOR GENERATING PRONOUNCEABLE SECURITY PASSWORDS

Ravi Ganesan, Arlington, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Oct. 25, 1994, Ser. No. 328,226

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—4 55 Claims



1. A method implemented on a computing device for forming a pronounceable security password using a plurality of first word segment portions, each having at least one character, and a plurality of second word segment portions, each having at least one character, with each of said plurality of first word segment portions (i) having an associated set of one or more said second word segment portions, each said second word segment portion within said associated set being different from others within said set and being combinable with said associated first word segment portion to form a pronounceable word segment and (ii) having a transition number corresponding to the number of said second word segment portions within the associated set of second word segment portions, comprising the steps of:

selecting a first one of said plurality of first word segment portions, wherein selection of any one of said plurality of first word segment portions is of substantially equal probability;

selecting a first one of said plurality of second word segment portions from said set of second word segment portions associated with said selected first word segment portion, wherein selection of any one of said second word segment portions within said associated set of second word segment portions is of substantially equal probability;

combining said selected first word segment portion and said selected second word segment portion to form a first pronounceable word segment; and

generating a pronounceable security password including said first pronounceable word segment only if consecutive characters of said first pronounceable word segment fail to correspond to those of said plurality of first word segment portions having a transition number less than a first threshold transition number.

5,588,057

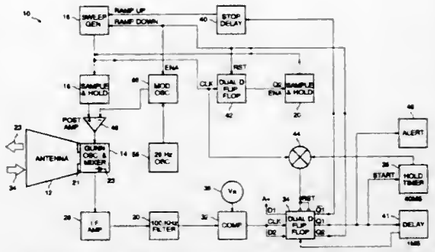
APPARATUS FOR DEFEATING RADAR SPEED DETECTION SIGNALS

M. David Sullivan, Los Altos, Calif., assignor to Voodoo Scientific, Inc.

Continuation of Ser. No. 57,160, May 4, 1993, abandoned. This application Jun. 20, 1995, Ser. No. 492,472

Int. Cl.[6] G01S *7/38*

U.S. Cl. 380—15 10 Claims



1. An apparatus for inhibiting capture by a remote seeking radar signal receiver of a return signal of a Doppler-type seeking radar signal, said apparatus comprising:

a microwave voltage-controlled oscillator means (MVCO) coupled to an antenna means for receiving seeking radar signals and for emitting a local oscillator signal;

a sweep control means coupled to said MVCO for sweeping a frequency range of said seeking radar signals at a first sweep rate with said local oscillator signal;

means coupled to said MVCO and to said first sweep control means for detecting an intercept of said seeking radar signals by said local oscillator signal by heterodyning said local oscillator signal and said seeking radar signals and for stopping sweeping of said local oscillator signal within an injection locking bandwidth of said intercept so that said oscillator signal locks to said seeking radar signals; and

means coupled to said MVCO for frequency modulating said local oscillator signal in order to cause emission through said antenna means of a frequency modulated carrier signal with deviation greater than the injection-locking bandwidth of said local oscillator signal.

5,588,058

METHOD AND DEVICE FOR SCRAMBLING AND DESCRAMBLING OF A SPECIFIC TELEVISION BROADCAST

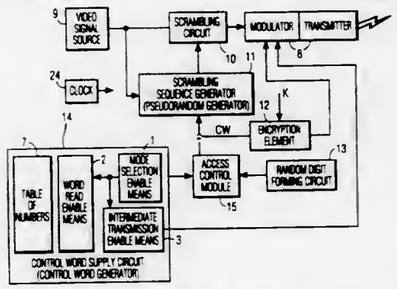
Jacques Le Berre, Puteaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1994, Ser. No. 219,055

Claims priority, application France, Mar. 31, 1993, 93 03777

Int. Cl.[6] H04N *7/167*

U.S. Cl. 380—20 12 Claims



1. A method of scrambling, at the level of a transmitter, and descrambling, at the level of receivers, a specific television transmission of limited duration, scrambling being performed by means of a pseudo-random generator which is initialized by a control word, descrambling involving the reconstruction upon reception, by means of a memory card device, of the control word which initializes a pseudo-random generator which is identical to that of the transmitter, said pseudo-random generator supplying the data necessary for descrambling, wherein in advance there are defined a table of numbers and different feasible modes of generating a control word by reading the table of numbers, and wherein the table is written into a read-only memory, the read-only memory being contained in descrambling cards issued to the users of receivers, after which at an instant of said specific television

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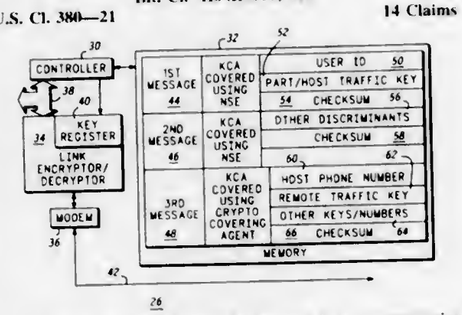
broadcast, the mode of reading a control word in the table is chosen in real time from among the various predefined feasible modes, which control word is read in conformity with said chosen mode in order to supply the control word to the transmitter in real tim, and immediately a signal is broadcast to the receivers so as to indicate a relavent mode of extracting the control word from the table, wherein the indicated mode corresponds to the chosen mode of the different feasible mode at the transmitter, as a result of which the receivers generate this control word according to the indicated mode from a descrambling card, the descrambling card comprising a simple memory in which the table of numbers is written.

5,588,059

COMPUTER SYSTEM AND METHOD FOR SECURE REMOTE COMMUNICATION SESSIONS

Ronald V. Chandos, Tempe, and Robert I. Foster, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 2, 1995, Ser. No. 398,181
Int. Cl.[6] H04L *9/00;9/08*
U.S. Cl. 380—21 **14 Claims**



7. A remote terminal for providing security for a communication session between said remote terminal and a host computer, said remote terminal comprising:

a first memory region containing encrypted user identifying data and an encrypted portion of a host traffic key;

a second memory region containing an encrypted remote terminal traffic key;

a modem for sending said encrypted user identifying data from said remote terminal to said host computer;

a user input device for obtaining a crypto-uncovering agent from a user of said remote terminal;

a controller coupled to said user input device, said first and second memory regions, and said modem for deciphering said encrypted remote terminal traffic key in response to said crypto-uncovering agent to obtain a deciphered remote terminal traffic key and for sending said encrypted user identifying data and said encrypted portion of said host traffic key to said host computer through said modem.

5,588,060

METHOD AND APPARATUS FOR A KEY-MANAGEMENT SCHEME FOR INTERNET PROTOCOLS

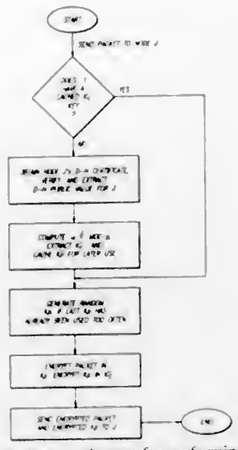
Ashar Aziz, Fremont, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jun. 10, 1994, Ser. No. 258,272
Int. Cl.[6] H04L *9/30*
U.S. Cl. 380—30 **20 Claims**

1. An improved method for a first data processing device (node I) to send data to a second data processing device (node J), comprising the steps of:

providing an element for performing the step of providing a secret value i, and a public value α^i mod p to said node I;

providing an element for performing the step of providing a secret value j, and a public value α^j mod p to said node J;



said node I including an element for performing the steps of:

obtaining a Diffie-Helman (DH) certificate for node J and determining said public value α^j mod p from said DH certificate;

computing the value of α^{ij} mod p, said node I further deriving a key K_{ij} from said value α^{ij} mod p;

utilizing said key K_{ij} to encrypt a randomly generated transient key K_p, and encrypting a data packet to be transmitted to node J using said key K_p;

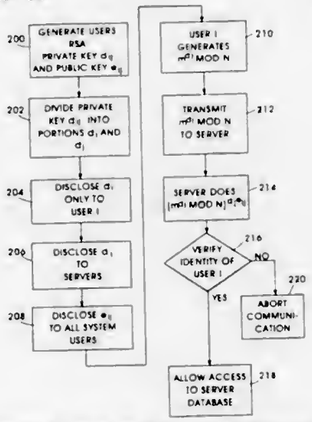
providing an element for performing the step of said node I sending said data packet encrypted using said key K_p to said node J.

5,588,061

SYSTEM AND METHOD FOR IDENTITY VERIFICATION, FORMING JOINT SIGNATURES AND SESSION KEY AGREEMENT IN AN RSA PUBLIC CRYPTOSYSTEM

Ravi Ganesan, Arlington, Va., and Yacov Yacobi, Berkeley Heights, N.J., assignors to Bell Atlantic Network Services, Inc., Arlington, Va., and Bell Communications Research, Inc., Livingston, N.J.

Filed Jul. 20, 1994, Ser. No. 277,808
Int. Cl.[6] H04L *9/30*
U.S. Cl. 380—30 **43 Claims**



1. A method for using an RSA cryptosystem comprising the steps of:

generating a private exponent key, having an associated modulus N of a predetermined bit length, and a corresponding public exponent key;

dividing said private exponent key into a first private key portion and a second private key portion, wherein said first private key portion has a bit length of no greater than fifteen percent of the bit length of the associated modulus N but not less than 56 bits;

disclosing said first private key portion to a first user; and

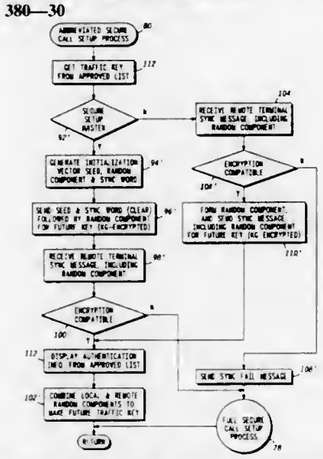
disclosing said second private key portion to a selected one or more other users of the RSA system.

5,588,062

SECURE COMMUNICATION SETUP METHOD

Barry N. Altschuler, Scottsdale; Douglas A. Hardy, Mesa; James A. Stephens, Chandler, and Joseph Kish, III, Gilbert, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 172,971, Dec. 27, 1993, Pat. No. 5,465,300. This application Jul. 13, 1995, Ser. No. 501,799
Int. Cl.[6] H04L *9/30*
U.S. Cl. 380—30 **6 Claims**



1. A method of engaging in a secure communication session with one of a plurality of remote terminals, said method comprising the steps of:

maintaining a list of approved network addresses;

obtaining a current network address for said one remote terminal;

determining whether said current network address corresponds to one of said approved network addresses; and

automatically initiating a secure call setup procedure when said current network address corresponds to one of said approved network addresses;

performing said full secure call setup process when no prior secure communication session has been conducted with said one remote terminal;

performing said abbreviated secure call setup process when a prior secure communication session has been conducted with said one remote terminal.

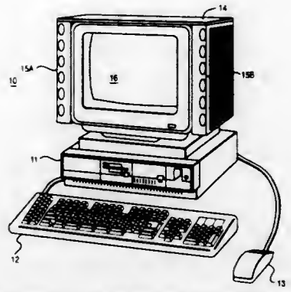
5,588,063

PERSONAL MULTIMEDIA SPEAKER SYSTEM

Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 969,677, Oct. 30, 1992, abandoned. This application May 18, 1994, Ser. No. 245,519
Int. Cl.[6] H04R *5/00*
U.S. Cl. 381—24 **2 Claims**

2. A personal computer equipped with a speaker system comprising:



a memory coupled to a system bus for storing sets of instructions to operate the computer;

a processor coupled to the system bus for executing the sets of instructions stored in the memory;

a display coupled to the system bus having a front, viewing surface and adjacent left side and right side surfaces;

a right and left speaker unit respectively comprised of a right and a left plurality of small speakers arranged in vertical linear arrays to the right and the left side surfaces of the display, each speaker unit having an exterior height dimension substantially equal to an exterior height dimension of the display and a width dimension substantially smaller than its exterior height dimension to minimize a total width of the display and the speaker units, each speaker in the right and left speaker units receiving a right or a left electrical signal from the personal computer respectively, so that the speakers in each speaker unit become a phased array;

means for locating a user's position in front of the display comprising at least two of the small speakers receiving the right or left electrical signal, to emit sound impulses which reflect off the user and to receive the reflected sound impulses and computer logic which measures the difference in time between the emitted sound impulses and the reflected sound impulses; and

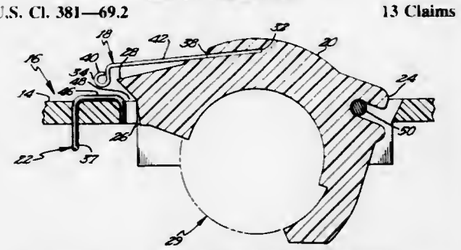
means for altering the left and right signals optimize sound at the located user's position.

5,588,064

HEARING AID BATTERY COVER SWITCH

John P. McSwiggen, Inver Grove Heights, and Randall W. Roberts, Eden Prairie, both of Minn., assignors to Wilbrecht Electronics, Inc., St. Paul, Minn.

Filed Jan. 16, 1996, Ser. No. 586,212
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—69.2 **13 Claims**



1. A battery cover switch for a hearing aid, comprising:

a battery cover pivotally attachable to the hearing aid;

a shorting contact cantileverly mounted to said battery cover and movable between a first, rest position and a second, contact position, said shorting contact comprising:

a flexible contact arm affixed at one end thereof to said battery cover and having an opposite, free, contact end disposed beyond the structural periphery of said battery cover in contacting juxtaposition to a contact member;

said contact member positioned to be touched by said shorting contact when said shorting contact is moved from said first, rest position to said second contact position.

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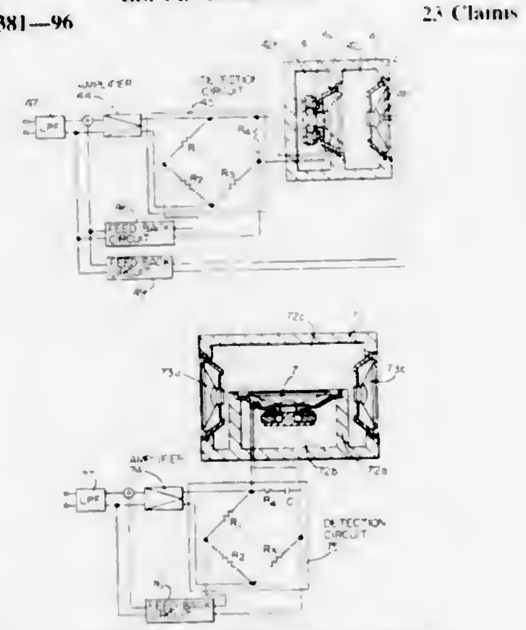
5,588,065
BASS REPRODUCTION SPEAKER APPARATUS
Shoji Tanaka, Kobe; Katsuhiko Imura, Osaka; and Satoshi Kageyama, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Kadoma, Japan
Continuation of Ser. No. 992,028, Dec. 17, 1992. This application May 23, 1995, Ser. No. 447,429
Claims priority, application Japan Dec. 20, 1991, 3-338093; Dec. 20, 1991, 3-338094; Dec. 25, 1991, 3-342676; Dec. 28, 1991, 3-359521
Int. Cl.^{6} H04R *3/00*
U.S. Cl. 381—96 **23 Claims**



1. A bass reproduction speaker apparatus, comprising:
a cabinet with an opening, having a division member inside thereof;
a speaker unit disposed at the division member;
a passive radiator disposed in the opening;
an amplifying means for driving the speaker unit;
a detection means for detecting motion of a moving system of the speaker unit; and
a feedback means for feeding back an output signal from the detection means to the amplifying means, the feedback means conducting both a velocity-type motion feedback and an acceleration-type motion feedback simultaneously over the same frequency band such that the acceleration-type motion feedback substantially aligns a height of peaks in an output sound pressure level versus frequency response of the speaker apparatus at two resonance frequencies in a low frequency range with each other; and the velocity-type motion feedback suppresses the peaks to obtain a substantially flat output sound pressure level over a wide range of low frequencies.

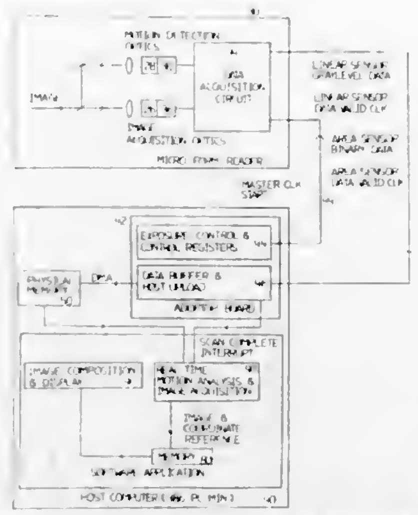
5,588,066
SPEAKER MOUNTING STRUCTURE
Su-Pei Yang, 2F, No. 110, Lane 103, Sec. 2, Nei Hu Rd., and Shyh-Lee Chen, No. 16, Alley 12, Lane 190, Chorng Yang Rd., Nan Gang District, both of Taipei, Taiwan
Filed May 7, 1996, Ser. No. 646,012
Int. Cl.^{6} H04R *25/00*
U.S. Cl. 381—188 **2 Claims**

1. A speaker mounting structure, comprising:
a speaker casing which is an annular structure integrally formed by punching, said speaker having a stepped circumferential wall consisting of an upper wall of a smaller diameter and a lower wall of a larger diameter, a notch being formed in said upper wall at a determined position by punching, a slot being provided at said lower wall at a position corresponding to that of said notch, and two positioning holes being disposed at both sides of said slot respectively;

a positioning block which is a four end stepped structure consisting of a stepped portion for matching said upper and lower walls of said speaker casing so that it may fit tightly thereonto, two mounting recesses located at an upper surface thereof, an axially oriented through hole provided at a rear end of each of said mounting recesses, an elongate slot disposed at either lateral side of each of said mounting recesses, two oblique guide grooves disposed between said two mounting recesses such that they extend from one front end of said mounting recesses to converge at an indented wall in the middle of a rear edge of said positioning block, two positioning posts respectively disposed at both sides of a bottom surface of said positioning block, and a resilient retaining clamp disposed between said positioning posts, said resilient clamp having two back-to-back hook portions at its ends;
two contact legs each being a rectangular inverted L-shaped electrically conductive piece and consisting of a horizontal portion and a vertical portion, said horizontal portion thereof having a stepped connecting element extending from one end thereof and two extended hook elements extending downwardly from both lateral sides thereof such that they may fit tightly into said elongate slots of the corresponding mounting recesses of said positioning block, said vertical portion constituting a contact leg portion which may be inserted into said through hole at the rear end of the corresponding mounting recess;
said positioning posts and said resilient retaining clamp being respectively fitted into said positioning holes and said slot of said lower wall of said speaker casing, said back-to-back hook portions of said resilient retaining clamp having a suitable resilience such that said resilient retaining clamp may be squeezed into said slot and be firmly retained therein, said elongate slots at both sides of the respective mounting recesses receiving said extended hook elements of said contact legs, said contact leg portion of each of said contact legs being inserted through said through hole at the rear end of each of said mounting recesses, said guide grooves between said mounting recesses being provided to guide the negative and positive wires extending upwardly from said notch of said speaker casing to said indented wall of said positioning block to be connected to said connecting elements of said contact legs.

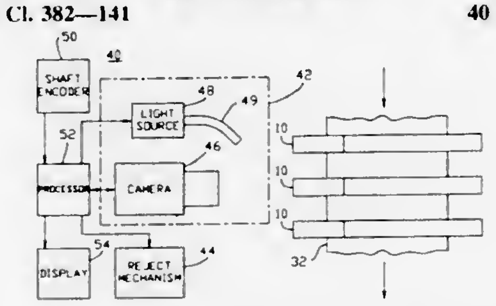
5,588,067
MOTION DETECTION AND IMAGE ACQUISITION APPARATUS AND METHOD OF DETECTING THE MOTION OF AND ACQUIRING AN IMAGE OF AN OBJECT
Fred M. Peterson, 401 Varsity Estates Bay N.W., Calgary, Canada, and James A. Yee, 76 Silver Springs Drive, N.W., Calgary, Canada
Filed Feb. 19, 1993, Ser. No. 19,847
Int. Cl.^{6} G06K *9/00; 9/64;* **H04N** *7/18*
U.S. Cl. 382—103 **35 Claims**

1. Apparatus for capturing images of a record of micro-images, the record of micro-images including non-sparse images, the apparatus comprising:
image acquisition means for repeatedly acquiring and at least temporarily storing successive non-sparse images from the record of micro-images;



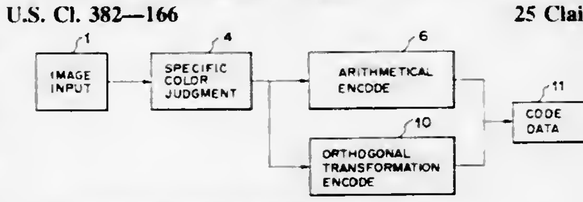
the image acquisition means including an area sensor disposed to receive light from the non-sparse images;
and the apparatus further including a second sensor disposed to receive light from the record of micro-images, the second sensor being operatively connected to the storage means for supplying images to the storage means;
correlation means for correlating successive non-sparse images from the record of micro-images to create a correlation matrix and determine if motion of the record of micro-images has occurred between successive images of the record of micro-images;
the correlation means including means to:
(i) calculate the Fourier transform of the correlation matrix to produce a phase spectrum, the Fourier transform defining a frequency space having axes and the phase spectrum defining a plane in the frequency space; and
(ii) calculate the degree of movement of the current image from the reference image using the projection of the plane onto the axes of the frequency space; and
storage means for permanently storing an image of the record of micro-images when motion has occurred between successive images.

5,588,068
METHODS AND APPARATUS FOR INSPECTING THE APPEARANCE OF SUBSTANTIALLY CIRCULAR OBJECTS
H. Cary Longest, Midlothian, and James L. Lynch, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 985,875, Dec. 4, 1992, Pat. No. 5,353,357. This application Sep. 30, 1994, Ser. No. 315,643
The portion of the term of this patent subsequent to Dec. 4, 2012, has been disclaimed.
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—141 **40 Claims**



1. Apparatus for determining whether an end surface of a cigarette has an acceptable appearance, said apparatus comprising:
means for forming an image of said end surface against a contrasting background, said image forming means comprising means for expanding said image to include imaging of a peripheral region along said cigarette adjacent said end surface;
means for digitizing said image as a plurality of pixels, each of said pixels having an initial digital value indicative of the brightness of a corresponding portion of said image;
means for processing said pixels so that each pixel having an initial digital value which has a first polarity relative to a predetermined threshold value is assigned a first of two processed digital values, and so that all other pixels are assigned a second of said two processed digital values, said threshold values being selected so that said background, substantially discolored areas of said end surface and substantially discolored areas of said peripheral region are assigned said first processed digital value and substantially undiscolored areas of said end surface and of said peripheral region are assigned said second processed digital value;
means for identifying as edge pixels those pixels which are adjacent to transitions between pixels having said first and second processed digital values;
means for associating edge pixels which are adjacent to one another so as to identify a boundary of each blob in said image;
means for identifying each blob as a first type of blob or a second type of blob by determining whether each boundary surrounds pixels having said first processed digital value or said second processed digital value, respectively;
means for calculating a characteristic of any blob of at least one of said blob types; and
means for determining acceptability of said image by comparing said calculated characteristic to a predetermined value.

5,588,069
IMAGE PROCESSING APPARATUS FOR ADVANTAGEOUSLY ENCODING BLOCKS OF DATA HAVING EITHER SUBSTANTIALLY THE SAME OR VARIED COLORS
Akihiro Katayama, Kawasaki, and Yasuhiko Yasuda, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 808,646, Dec. 17, 1991, abandoned. This application Mar. 2, 1995, Ser. No. 397,716
Claims priority, application Japan, Dec. 19, 1990, 2-403548
Int. Cl.^{6} G06K *9/36*
U.S. Cl. 382—166 **25 Claims**



1. An image processing apparatus comprising:
input means for inputting image data representing an image;
dividing means for dividing the image data into a plurality of blocks, each of which is composed of a plurality of pixels;
discriminating means for discriminating, for each block, whether that block is of a first block type or of a second block type, a first block type being one in which not all of the pixels are substantially the same predetermined color and a second block type being one in which all of the pixels are substantially the same predetermined color;
encoding means for encoding, by using an orthogonal transformation, the image data in the first type blocks; and
outputting means for outputting the image data in the first type blocks encoded by said encoding means,
wherein the image data in the second type blocks is not outputted in orthogonally-transformed form.

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5,588,070

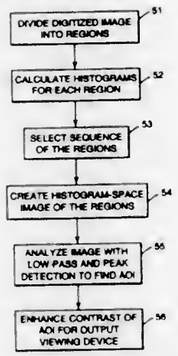
Patent Not Issued For This Number

5,588,071

IDENTIFYING AN AREA OF INTEREST USING HISTOGRAM DATA ARRANGED IN PREDETERMINED SEQUENCE

John C. Schultz, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 26, 1994, Ser. No. 329,493
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—168 **23 Claims**



1. A method of analyzing a data set of a digitized image to identify an area of interest, the method comprising the steps of:

dividing the digitized image into a plurality of regions;

calculating histogram data for frequencies of image values within each of the plurality of regions;

organizing the histogram data for each of the regions according to a predetermined sequence of the plurality of regions to create a data set for an image in histogram space of the plurality of regions; and

analyzing said data set for the image in histogram space of the plurality of regions to identify localities of maxima and minima in grouped image value characteristics which correspond to the area of interest within the digitized image.

5,588,072

METHOD AND APPARATUS FOR SELECTING BLOCKS OF IMAGE DATA FROM IMAGE DATA HAVING BOTH HORIZONTALLY- AND VERTICALLY-ORIENTED BLOCKS

Shin-Ywan Wang, Tustin, Calif., assignor to Canon Kabushiki Kaisha, Tokyo, Japan

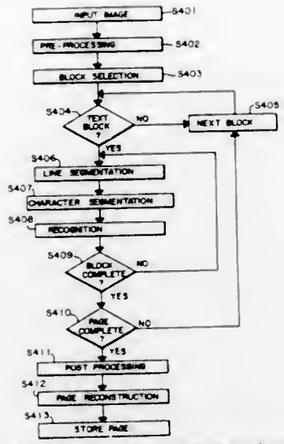
Filed Dec. 22, 1993, Ser. No. 171,720
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—176 **49 Claims**

1. A method of selecting blocks of pixels from pixel image data comprising:

an outlining step in which contours of connected components in the pixel image data are outlined,

a first connecting step in which connected components are selectably connected widthwisely based on size and proximity to other connected components to form lines;

a second connecting step in which lines of widthwise connected components are selectably connected vertically based on size and proximity to other lines to form rectangles around blocks of pixel image data; and



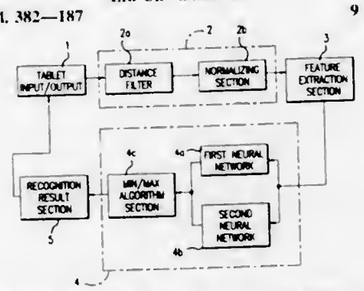
a forming step in which an irregularly-shaped curve is formed around each block of pixel image data surrounded by a rectangle which overlaps another block of pixel image data.

5,588,073

ONLINE HANDWRITTEN CHARACTER RECOGNIZING SYSTEM AND METHOD THEREOF

Heun J. Lee, Seoul, and Moon J. Joe, Kyoungki-do, both of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 309,569, Sep. 20, 1994, abandoned, which is a continuation of Ser. No. 971,649, Nov. 5, 1992, abandoned. This application Oct. 30, 1995, Ser. No. 550,227
Claims priority, application Rep. of Korea, Feb. 14, 1992, 1992-2214
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—187 **9 Claims**



1. An online handwritten character recognizing system, comprising:

an input device inputting a character and outputting a character signal including character points of said character;

a preprocessor connected to said input device and receiving said character signal and converting said character points into sample points which have normalized magnitude and uniform sampling interval;

feature extracting means for receiving said sample points from said preprocessor and transforming a coordinate function made from said sample points into Fourier coefficients representing the character;

character recognition means for receiving said Fourier coefficients from said feature extracting means, and recognizing the inputted character from said Fourier coefficients, wherein said character recognition means including:

a first neural network for generating a plurality of first signals responsive to real part of said Fourier coefficients;

a second neural network for generating a plurality of second signals responsive to imaginary part of said Fourier coefficients; and

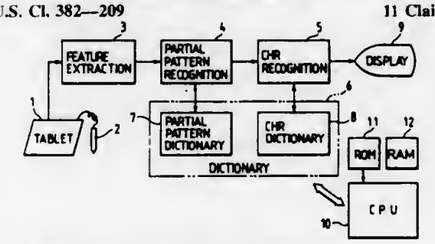
MIN/MAX algorithm means for selecting a plurality of smaller values from the plurality of first and second signals, each smaller value being selected as the smaller of a corresponding pair of first and second signals, and selecting a largest value from the plurality of smaller values to recognize the inputted character.

5,588,074

DATA RECOGNITION EQUIPMENT AND METHOD USING PARTIAL PATTERN RECOGNITION

Mitsumasa Sugiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 504,625, Apr. 4, 1990, abandoned. This application Oct. 4, 1993, Ser. No. 131,913
Claims priority, application Japan, Apr. 6, 1989, 1-085655
Int. Cl.[6] G06K *9/62;9/46*
U.S. Cl. 382—209 **11 Claims**



1. Data recognition equipment comprising:

dictionary means for storing partial pattern data and pattern data;

inputting means for inputting segmented pattern data;

recognition means for recognizing partial pattern data among input pattern data from said inputting means by comparison with the partial pattern data stored in said dictionary means;

selection means for selecting a candidate pattern having the recognized partial pattern from said dictionary means;

first comparing means for comparing the selected candidate pattern with the input pattern data for each part other than the recognized partial pattern data and for outputting a distance obtained from the comparison in correspondence to the selected candidate pattern;

second comparing means for comparing the output distance from said first comparing means with a reference value; and

third comparing means for comparing the selected candidate pattern with the input pattern data at a part of the recognized partial pattern if it is determined that the distance is smaller than the reference value by said second comparing means; and

output means for outputting character information representing the candidate pattern compared with the input pattern data by said third comparing means.

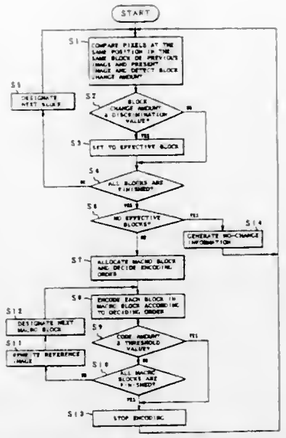
5,588,075

METHOD AND APPARATUS FOR ENCODING AND DECODING IMAGE DATA

Hirotaka Chiba; Kimitaka Murashita, and Tsugio Noda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 28, 1994, Ser. No. 233,421
Claims priority, application Japan, Sep. 2, 1993, 5-218269
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—239 **22 Claims**

1. A compressing method of image data which is continuously input, comprising:



a reference image holding step of holding reference image data;

an image holding step of holding said input image data;

an effective block detecting step of dividing said input image data which is at present a target to be compressed and said reference image data into blocks each including (m×n) pixels, and comparing and detecting each block having a change as an effective block;

a compressing order deciding step of grouping said blocks into macro blocks each having a predetermined number of said blocks, and deciding a compressing order of said macro blocks in accordance with a number of effective blocks in each macro block;

an address generating step of generating pixel addresses of said input image data on a block unit basis in accordance with the compressing order of the macro blocks decided in said compressing order deciding step;

a compressing step of reading out said input image data by pixels according to the pixel addresses generated in said address generating step and converting said input image data into codes on a block unit basis;

a code output step of outputting encoded data obtained by combining the order information decided in said compressing order deciding step and the codes converted in said compressing step; and

a compressing end step of stopping the compression in said compressing step and processing next image data in the case where a code amount by said compressing step exceeds a threshold value before the compression of the image data of one picture screen is finished and processing the next image data in the case where the compression of the image data of one picture screen is finished before said code amount exceeds said threshold value.

5,588,076

OPTICAL FIBRE MANAGEMENT SYSTEM

John Peacock, Otley; Peter L. J. Frost, and John Kerry, both of Ipswich, all of England, assignors to British Telecommunications public limited company, London, England

Continuation-in-part of Ser. No. 202,190, Feb. 24, 1994, Pat. No. 5,548,678. This application Jul. 21, 1994, Ser. No. 278,217
Claims priority, application European Pat. Off., Sep. 10, 1993, 93307145; Apr. 28, 1994, 94303091
Int. Cl.[6] G02B *6/35*
U.S. Cl. 385—20 **8 Claims**

1. An optical fibre management system for managing a plurality of optical fibres in an optical fibre communication system having at

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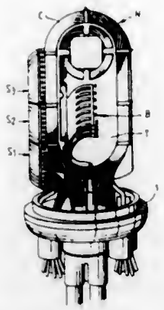


least one fibre separation point between a terminal site and an optical signal processing node such that the fibre of each single optical fibre circuit is routed separately from the fibre of other circuits, said system comprising:

a plurality of individually accessible fibre service trays with access ports for optical fibres, and

each said service tray having therein only optical fibre for a single circuit carrying optical signals between a first separation point and either a terminal or a second separation point,

whereby optical signals carried by any given single circuit are not degraded by handling operations carried out on the fibres of other circuits.

5,588,077

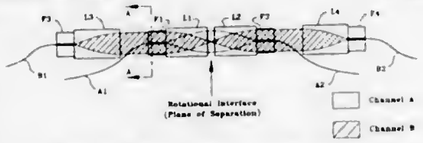
IN-LINE, TWO-PASS, FIBER OPTIC ROTARY JOINT

Shane H. Woodside, Lower Sackville, Canada, assignor to Focal Technologies, Inc., Nova Scotia, Canada

Filed May 22, 1995, Ser. No. 445,752

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—26 **10 Claims**



2. A two-channel fiber optic rotary joint for transmission of optical signals, comprising:

(a) a rotational portion aligned with a stationary portion, having a rotational axis extending therealong, and a plane of separation between said rotational and stationary portions;

(b) means for mounting first and second optical fibers in said rotational portion, spaced apart along said axis;

(c) means for mounting third and fourth optical fibers in said stationary portion, spaced apart along said axis;

(d) means for optically coupling first channel light between said first optical fiber and one of said third or fourth optical fibers;

(e) means for optically coupling second channel light between said second optical fiber and the other of said third or fourth fibers so that said second channel light shares the same physical space as said first channel light; and

(f) the mounting means and the coupling means positioned in said rotational portion on one side of said plane of separation being a mirror image of the mounting means and the coupling means positioned in said stationary portion on the other side of said plane of separation.

5,588,078

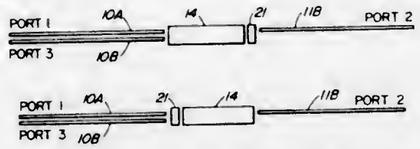
NON-RECIPROCAL OPTICAL WAVEGUIDE COUPLING DEVICE

Yihao Cheng, Kanata, and Gary S. Duck, Nepean, both of Canada, assignors to JDS Fitel Inc., Nepean, Canada

Continuation-in-part of Ser. No. 164,547, Dec. 10, 1993, abandoned. This application Aug. 9, 1995, Ser. No. 513,028

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—33 **18 Claims**



1. A non-reciprocal optical waveguide-coupling device comprising a first optical waveguide and a second optical waveguide coupled by a common optical path, respective ends of the first and second optical waveguides being spaced apart along the optical path, focusing lens means disposed in the optical path between the respective ends of the first optical waveguide and the second optical waveguide, the focusing lens means having foci at or near respective ends of the waveguides, such that light beams leaving one of the foci will be re-focused by the focusing lens means at the other of the foci before coupling into the second optical waveguide, and a non-reciprocal element comprising a plurality of optical components, the components cooperating so that light beams from the first optical waveguide couple into the second optical waveguide but light beams from the second optical waveguide do not couple into the first optical waveguide, all of said components being situated adjacent one of the foci, the device further comprising at least one optical waveguide adjacent the first optical waveguide and at least one optical waveguide adjacent the second optical waveguide, the arrangement being such that light beams from the at least one optical waveguide adjacent the first optical waveguide are coupled into the at least one optical waveguide adjacent the second optical waveguide, while light beams from the at least one optical waveguide adjacent the second optical waveguide are displaced away from the at least one optical waveguide adjacent the first optical waveguide.

5,588,079

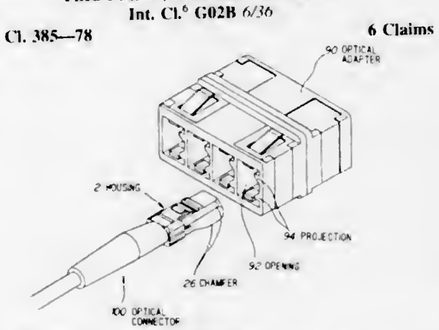
OPTICAL CONNECTOR

Takashi Tanabe, and Kouji Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Feb. 17, 1995, Ser. No. 390,471

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—78 **6 Claims**



1. An optical connector, comprising:

a housing having a round opening with equally spaced pointed ridges positioned around the periphery of said round opening, said round opening including a guide for receiving a ferrule for an optical fiber, said guide comprising:

a first tier comprising:

first sloped portions extending down a side of said equally spaced pointed ridges;

second, rounded sloped portions, adjacent said first sloped portions;

a second tier comprising:

first rectangular flat surfaces abutting said first sloped portions centered about said equally spaced pointed ridges; and

second rectangular flat surfaces positioned between two of said first rectangular flat surfaces;

a stopper surface positioned at a bottom end of said second tier, said stopper surface having a round center opening; and

a ferrule, comprising:

a capillary support for supporting an optical fiber;

a capillary being insertable into said round center opening of said stopper surface; and

a flange, connected between said capillary and said capillary support and shaped to fit into said second tier to hold said ferrule in a stationary position when said flange is guided by said first tier into said second tier against said stopper surface.

5,588,080

CONNECTOR FOR CONNECTING AN OPTICAL FIBER CABLE

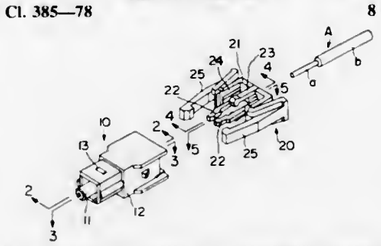
Shigeto Kawamura, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed May 19, 1995, Ser. No. 445,354

Claims priority, application Japan, May 25, 1994, 6-111170

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—78 **8 Claims**



1. A connector for connecting an optical fiber (A) having a core (a) and a sheath (b), said optical fiber (A) having a mating end, said core (a) protecting axially beyond said sheath (b) at said mating end, said connector comprising a housing (**10**) unitarily formed with a ferrule (**11**), and a fixing member (**20**) comprising a holding plate (**21**) formed with an insertion hole (**21***a*) through which the optical fiber cable (A) is inserted, flexible core retainers (**22**) extending forward from the holding plate (**21**) and having projections (**22***a*) formed on a leading end thereof for pressing the core (a) of the optical fiber cable (A), flexible sheath retainers (**23**) extending forward from the holding plate (**21**) and having projections (**23***b*) formed on a leading end thereof for pressing the sheath (b) of the optical fiber cable (A), and locking portions (**24**) for locking the fixing member (**20**) with the housing (**10**), wherein, for coupling the connector with a mating connector (**30**), coupling structure is provided on the connector, said coupling structure comprising at least one of locking arms (**25**) formed on the fixing member (**20**) for engaging portions (**32**) formed on the mating connector (**30**) and a friction lock projection (**13**) formed on the housing (**10**) for pressing the mating connector (**30**).

5,588,081

LIGHT COUPLING DEVICE TO COUPLE A LIGHT SOURCE TO AN OPTICAL FIBER

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Matsudo, Japan

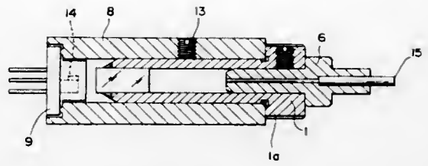
Filed May 24, 1995, Ser. No. 448,981

Claims priority, application Japan, Nov. 11, 1994, 6-303041

Int. Cl.[6] G02B *6/42*

U.S. Cl. 385—93 **7 Claims**

1. A light coupling device for coupling a light source to an optical fiber comprising:



a light power receiving element assembly including:

a first cylindrical sleeve defining a first through-hole therein, said first through-hole having a first end, a second end and an optical axis;

a GRIN lens positioned within the first end of the first through-hole of said first cylindrical sleeve;

a ferrule adapted to receive the optical fiber therein, the ferrule being disposed within the second end of the first through-hole of said first cylindrical sleeve so as to be movable along the optical axis of said first through-hole, movability of the ferrule along the optical axis of said first through-hole allowing a determination of a focal length between the GRIN lens and an incident end face of the optical fiber; and

a first setting means disposed on the first cylindrical sleeve for setting a relative position of the ferrule with respect to the first cylindrical sleeve, the ferrule and the first cylindrical sleeve thereby being held in position with respect to one another when the GRIN lens and the incident end face of the optical fiber are separated by a distance equal to the focal length therebetween; and

a light source assembly including:

a second cylindrical sleeve defining a second through-hole therein having a first end, a second end and an optical axis, the first cylindrical sleeve being coaxially disposed within the second end of the second through-hole of said second cylindrical sleeve so as to be movable along the optical axis of the second through-hole;

a light source unit concentrically disposed within the second through-hole at the first end thereof, movability of the first cylindrical sleeve along the optical axis of the second through-hole allowing a determination of a focal length between the light source unit and the GRIN lens; and

a second setting means disposed on the second cylindrical sleeve for setting a relative position of the first cylindrical sleeve with respect to the second cylindrical sleeve, the first cylindrical sleeve and the second cylindrical sleeve thereby being held in position with respect to one another when the light source unit and the GRIN lens are separated by a distance equal to the focal length therebetween.

5,588,082

OPTICAL CABLE FUSION SPLICE

Peter J. Whitesmith, "Aisling", Wyche Lane, Bunbury, Tarporley, Cheshire CW6 9PS, England

Filed Sep. 19, 1995, Ser. No. 529,999

Claims priority, application United Kingdom, Sep. 20, 1994, 9418878

Int. Cl.[6] G02B *6/00;6/36*

U.S. Cl. 385—96 **13 Claims**

1. A method of forming a fusion splice between two optical ribbon cables, which comprises:

(i) positioning end portions of the ribbon cables to be spliced in line with one another, and separated from one another by a pre-determined distance;

(ii) firing a preparation arc across the ends of the ribbon cables of sufficient energy to soften the ends of the optical fibres forming the ribbon cables;

(iii) firing a fusion arc across the ends of the ribbon cables after a defined period of time following termination of the preparation arc to fuse the ends of the fibres; and

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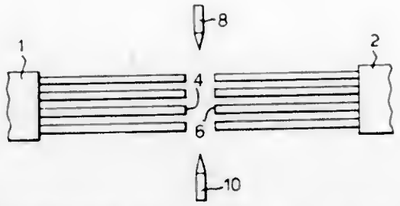


(iv) simultaneously with, or subsequent to the fusion arc, moving the ribbon cables toward one another into contact, thereby to effect a fusion splice between the ribbon cables.

5,588,083

NON-LINEAR OPTICALLY ACTIVE POLYCARBONATE

Tjerk O. Boonstra, SK Duiven, and Ulfert E. Wiersum, AV Velp, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Filed Sep. 26, 1994, Ser. No. 312,254

Claims priority, application Netherlands, Sep. 29, 1993, 9301679

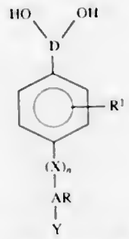
Int. Cl.[6] G02B *6/00;* **C08G** *64/00*

U.S. Cl. 385—122 **13 Claims**

1. An optical waveguide component, characterised in that it comprises a non-linear optically active side chain polycarbonate which sandwiched between deflective layers of lower index of refraction than the non-linear optically active side chain condensation polymer and which is obtained from a monomer mixture comprising:

an NLO diol satisfying formula 1:

formula 1



wherein D is a trivalent donor group comprising 2–10 aliphatic, alicyclic, aromatic or heterocyclic carbon atoms, and comprising at least one alkoxy-oxygen atom, at least one sulphur atom, at east one selenium atom, or a nitrogen atom directly or conjugatedly bonded to the benzene ring, and

wherein

X stands for $—CR_2=CR_2—$, $—N=N—$, $—CR_2=N—$ or $—N=CR_2—$,

Y stands for —CN, $—NO_2$, $CR^2=C(CN)_2$, $—CF_3$, SO_2R^4, $—C(CN)=C(CN)_2$, barbiturate groups, or thiobarbiturate groups,

AR stands for a six-membered aromatic ring, a six-membered aromatic ring substituted with one or more R^3 groups, a non-saturated 6 membered ring, a non-saturated six-membered ring substituted with one or more R^2 groups, a five-membered heteroatomic ring containing O, N, S, Se, a five-membered heteroatomic ring substituted with one or more R_2 groups and containing O, N, S or Se, a fused ring structure,

R^1 stands for —halogen, $—R^2$, $—OR^2$, $—COR^2$, —CN or $—CF_3$

R^2 stands for —H, —halogen, an alkyl group having 1–6 carbon atoms, a halo substituted alkyl group having 1–6 carbon atoms,

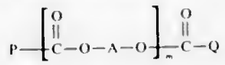
R^2 stands for —halogen, $—R^2$, $—OR^2$, COR^2, —CN, NO_2, SO_2R^4 or CF_3,

R^4 stands for an (halogenated) alkyl group having 1–4 carbon atoms,

n is an integer from 0 to 4, with the X-groups being the same or different, and

a compound according to formula 2:

formula 2



wherein:

P stands for —Cl, O—R, an imidazole group or —O—Ph,

Q stands for —Cl, O—R, an imidazole group or —O—Ph,

R stands for an alkylene group having 1–6 carbon atoms,

Ph stands for phenyl,

A stands for —Ph—, halogenated —Ph—, $—Ph—C(CH_3)_2—Ph—$, $—Ph—SO_2—Ph—$, a cycloalkylene group having 1–24 carbon atoms, a halo substituted cycloalkylene group having 1–24 carbon atoms, an arylene group having 1–20 carbon atoms, or a naphthalene group,

m is an integer from 0 to 5, with the A-groups being the same or different.

5,588,084

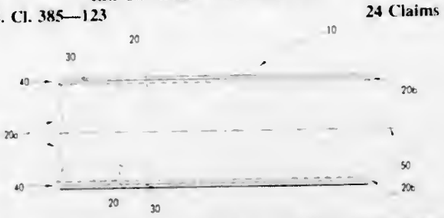
SCINTILLATING OPTICAL FIBERS CONTAINING NON-UNIFORMLY DISTRIBUTED DOPANTS AND PROCESS FOR PREPARING SAME

Kurtis F. Johnson, 112 E. Sinclair Rd., Tallahassee, Fla.

Filed Apr. 28, 1995, Ser. No. 431,281

Int. Cl.[6] G02B *6/02;* **F21V** *9/16*

U.S. Cl. 385—123 **24 Claims**



1. A scintillating fiber comprising an outer layer, an inner layer, a fiber center and an interface between the inner and outer layers, wherein the distance between the fiber center and any point of the interface in a fiber cross section defines a radius and the distance between the fiber center and any point located along the radius defines a fractional radius, and wherein the outer layer has an index of refraction lower than that of the inner layer and wherein the inner layer contains a dopant non-uniformly distributed within the inner layer.

5,588,085

RADIOLYTIC METHOD FOR MAKING A MODE-FIELD TRANSFORMING OPTICAL WAVEGUIDE

Benjamin I. Greene, Westfield; Chellappan Narayanan, North Plainfield, and Herman M. Presby, Highland Park, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 17, 1996, Ser. No. 633,323

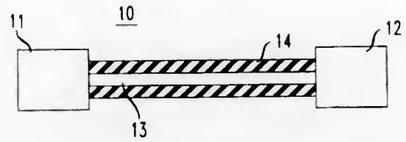
Int. Cl.[6] G02B *6/02;* **C03B** *37/023*

U.S. Cl. 385—123 **14 Claims**

1. A method for making a silicate optical waveguide structure for transforming an optical beam of a first modal spot size to a beam of a second modal spot size, said method comprising the step of:

selecting an irradiation energy that is at least partially absorbed by the cladding;

applying a variable dosage of radiation along the length of said structure, said radiation having an energy equal to said irradiation energy such that a refractive index change of the cladding is greater than a refractive index change of the core.



8. A silicate optical waveguide structure having a core and cladding for transforming an optical beam of a first modal spot size to a beam of a second modal spot size, said structure fabricated by a method including the steps of:

selecting an irradiation energy that is at least partially absorbed by the cladding;

applying a variable dosage of radiation along the length of said structure, said radiation having an energy equal to said irradiation energy such that a refractive index change of the cladding is greater than a refractive index change of the core.

5,588,086

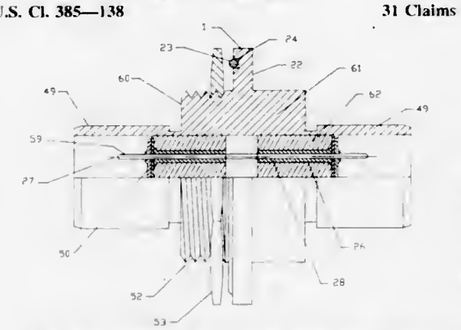
FIBER OPTIC HERMETIC BULKHEAD PENETRATOR FEEDTHROUGH MODULE AND METHOD OF FABRICATING SAME

Robert J. Fan, Canoga Park, Calif., assignor to LiteCom, Inc., Canoga Park, Calif.

Filed Apr. 1, 1993, Ser. No. 41,724

Int. Cl.[6] G02B *6/00*

U.S. Cl. 385—138 **31 Claims**



1. A hermetic pressure differential and temperature differential feedthrough system comprising:

a signal transmitting optical fiber or plurality of optical fibers; a hermetic sealing material providing an extremely high fluid or gas differential pressure and temperature differential seal; a feedthrough housing of suitable material to provide a substantial bond between said housing and said hermetic sealing material; said signal transmitting optical fibers which are suitably cleaned and may be stripped of buffer coatings to provide a substantial bond between said fibers and said hermetic sealing material; said signal transmitting optical fibers passing through said feedthrough housing which may have a connector interface on either or both sides of said feedthrough comprised of fibers hermetically sealed within a fiber optic terminus or other system requiring interfaces and requiring interconnecting means to couple the feedthrough housing to a connector half; said bonds between said hermetic sealing material and said signal transmitting optical fiber, between said hermetic sealing material and said fiber optic termini, and between said sealing material and said housing are provided by mechanical, chemical or environmental means.

5,588,087

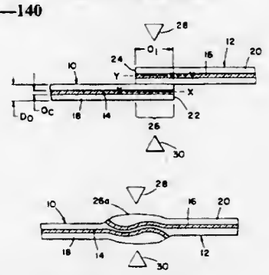
OVERLAPPING FUSION ATTENUATOR

David J. Emmons, Plymouth, and Liang-Ju Lu, Eden Prairie, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 205,342, Mar. 8, 1994, abandoned, which is a continuation of Ser. No. 582, Jan. 4, 1993, abandoned, which is a continuation of Ser. No. 815,963, Jan. 2, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 306,241

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—140 **32 Claims**



24. A fiber optic attenuator comprising:

first and second segments, each having respective first and second ends, a portion of each segment including the first end being referred to as a first end portion, said fiber segments being characterized by a fiber diameter and having respective cores having respective ends;

said respective first end portions being fused to each other with said ends of said cores completely encapsulated and overlapping each other in an overlap region by an axial distance that is greater than said fiber diameter, said respective second ends being located on longitudinally opposite sides of said overlap region.

5,588,088

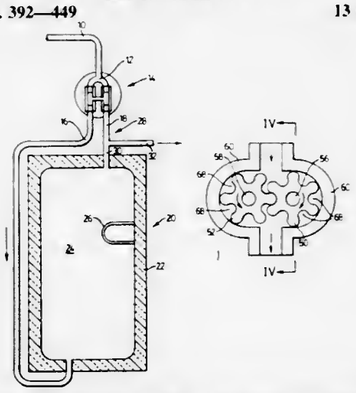
HOT WATER TEMPERING SYSTEM UTILIZING A STORAGE TANK, A BYPASS LINE AND A PROPORTIONAL FLOW CONTROLLER

Michael T. Flaman, 20 Treeline Court, Etobicoke, Ontario, Canada

Filed Jun. 20, 1994, Ser. No. 262,705

Int. Cl.[6] F24H *1/18*

U.S. Cl. 392—449 **13 Claims**



1. A hot water tempering system comprising in combination:

a hot water storage tank having an inlet line and an outlet line, the inlet line being connectable to a cold water supply line;

a bypass line connected between the inlet line and the outlet line; and

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[illegible]

5,588,086

BARK AMPLITUDE COMPONENT CODER FOR A SAMPLED ANALOG SIGNAL AND DECODER FOR THE CODED SIGNAL

[illegible]

Division of Ser. No. 54,428, Apr. 28, 1993, which is a continuation-in-part of Ser. No. 777,748, Oct. 4, 1991, abandoned. This application May 6, 1995, Ser. No. 435,366.

Claims priority, application Netherlands, Oct. 25, 1990, 9002308.

Int. Cl.[6] G10L [illegible]

U.S. Cl. 395—[illegible] 8 Claims

[illegible]

5,588,091

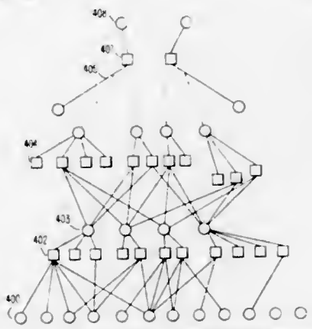
DYNAMICALLY STABLE ASSOCIATIVE LEARNING NEURAL NETWORK SYSTEM

Daniel L. Alkon, Thomas P. Vogl, both of Bethesda; Kim T. Blackwell, Wheaton; and Garth S. Barbour, Laurel, all of Md., assignors to Environmental Research Institute of Michigan, Arlington, Va.

Continuation of Ser. No. 88,646, May 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 524,519, May 17, 1990, abandoned, and Ser. No. 448,090, Dec. 12, 1989, Pat. No. 5,019,465, which is a continuation-in-part of Ser. No. 353,107, May [illegible], 1989, abandoned. This application Mar. 2, 1995, Ser. No. 400,124.

Int. Cl.[7] G06F 15/18

U.S. Cl. 395—24 2 Claims



1. A neural network comprising a plurality of sequential subnetworks, said plurality having at least a first subnetwork and a second subnetwork, wherein

(A) said first subnetwork is configured to accept a plurality of input signals from sources external to said neural network and comprises:

5,588,090

SIGNAL PROCESSING APPARATUS

Toshiyuki Furuta; Shuji Motomura, both of Yokohama; Takahiro Watanabe, Sagamihara, all of Japan, and David G. Stork, Menlo Park, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 19, 1994, Ser. No. 246,342

Claims priority, application Japan, May 20, 1993, 5-118087; Aug. 20, 1993, 5-206282; Apr. 12, 1994, 6-073135

Int. Cl.[6] G06F 15/18

U.S. Cl. 395—23 10 Claims

1. A signal processing apparatus having a circuit network formed by connecting a plurality of neuron units into a network,

said neuron unit being provided with self-learning means which comprises:

(1) a first plurality of patches, wherein

(i) each patch of said plurality (a) responds to and records features of said input signals, (b) has a patch identifier and produces a similarity measure, said similarity measure having a value corresponding to a similarity between a feature recorded by said patch from a training pattern and a feature of an input signal, and

(ii) said first plurality of patches generates first patch outputs,

and

(2) a first plurality of output neurons which accepts input from said first patch outputs and generates first neuron outputs;

(B) said second subnetwork comprises a second plurality of patches and a second plurality of output neurons, wherein said second plurality of patches accepts said first neuron outputs as input and generates second patch outputs, and wherein said second plurality of output neurons accepts said second patch outputs as inputs and generates second neuron outputs;

(C) all subnetworks of said plurality of sequential subnetworks, exclusive of said first subnetwork, are linked such that each subnetwork accepts as inputs neuron outputs of the immediately preceding subnetwork,

and

(D) inputs to the final subnetwork of said plurality of sequential subnetworks further include unconditioned stimuli.

5,588,092

PRINTER CONTROL CIRCUIT AND THE PRINTER CONTROLLED THEREBY

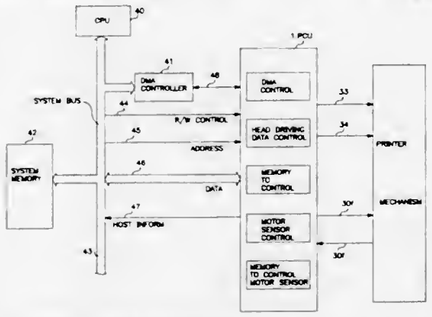
Hirofumi Komiya, Hirakata; Keita Sakai, Neyagawa; Kazumine Koshi, Neyagawa, and Noriyuki Saito, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1993, Ser. No. 67,744

Claims priority, application Japan, May 26, 1992, 4-133314

Int. Cl.[6] G06K 15/00

U.S. Cl. 395—109 17 Claims



1. A printer controller comprising:

host-interface means for receiving communication data from a system including a host-computer;

receiving control means for receiving the output of said host interface means through a data bus and controlling head communication data transferred to a printer thermal-head;

driving-data control means for controlling activating data to be transmitted to said thermal-head according to a temperature signal and a printer supply voltage;

motor control means for receiving the output of said host-interface means through a data-bus and controlling a paper-feed motor of the printer;

total control means connected to said host-interface means through said data-bus, for controlling said receiving control means, driving-data control means, and motor-control means through respective dedicated control lines;

memory means for storing the control procedures of at least one of said receiving control means, driving-data control means, motor control means, and said total control means; and

printer interface means for receiving the outputs of said driving data control means and motor control means and outputting the activating data to said thermal-head to control printings performed by said thermal-head mid signals necessary to drive components in the printer;

wherein said printer controller is controlled by said host computer.

5,588,093

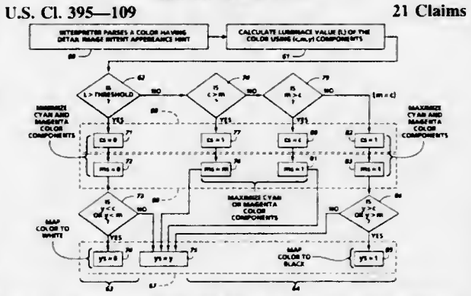
COLOR MAPPING TO PRESERVE DETAIL

Steven J. Harrington, Holley, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1993, Ser. No. 168,444

Int. Cl.[6] G06K 15/00

U.S. Cl. 395—109 21 Claims



18. A method for preserving detail of a color image adapted to be reproduced as a halftone pattern, comprising the steps of:

identifying an image element forming part of the color image, with the image element having a first color defined by a plurality of colorants;

mapping the first color of the image element identified by said identifying step to a second color that appears solid when reproduced as a halftone so as to preserve detail of the color image; and where said mapping step comprising the step of minimizing one colorant of the first color.

5,588,094

POST-PROCESSING BIT-MAP DECIMATION COMPENSATION METHOD FOR PRINTING HIGH QUALITY IMAGES

Stephen M. Kroon, Lake Oswego, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Jan. 3, 1994, Ser. No. 176,611

Int. Cl.[6] G06K 1/00

U.S. Cl. 395—109 8 Claims

1. A method of reducing dot overlap in a two-dimensional image printed on a print medium and represented by an array of pixels in a rendered bit map, the pixels arranged in a set of nonoverlapping lines extending in the direction of one of the two dimensions and having first and second states that correspond to respective lighter and darker printed dots, the set of nonoverlapping lines forming a supercell structure comprising:

designating certain pixels in the array as restricted pixels whose states cannot be changed;

examining for each of multiple pixels in a line included in each set of nonoverlapping lines the states of adjacent pixels in lines adjacent to the line in whose pixel is under examination;

determining whether each of the multiple pixels under examination and its adjacent pixels are in the second state and, if the pixel under examination and its adjacent pixels are not in the second state or if the pixel under examination is a designated restricted pixel, leaving unchanged the state of the pixel under

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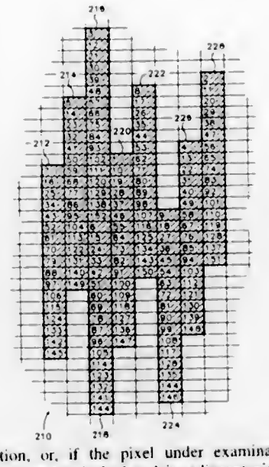


examination, or, if the pixel under examination is not a designated restricted pixel and its adjacent pixels are in the second state, changing the state of the pixel under examination to a state different from the second state and thereby causing an update of the rendered bit map; and

producing a completed update of the rendered bit map by repeating the examining and determining steps for multiple pixels in each of multiple lines in each set, the completed update of the rendered bit map reducing dot overlap in a printed image via linear spot growth to provide uniform darkening and the use of a supercell structure to maximize the number of gray scale levels, the printed image corresponding to the completed update of the rendered bit map.

5,588,095

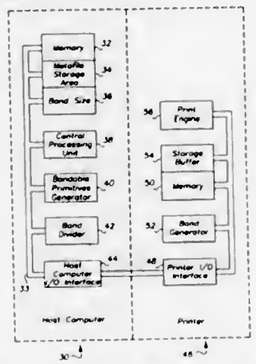
SYSTEM AND METHOD OF PRINTER BANDING

Stephen V. Dennis, Bothell, and Gabe L. Newell, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 911,523, Jul. 10, 1992. This application Jun. 7, 1995, Ser. No. 472,502

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—116 **4 Claims**



1. A computer for processing data to be printed by a printer coupled to the computer and receiving data from the computer, for printing a page of data on the printer with unidirectional page movement, using an unprocessed data file that describes a plurality of objects to be printed on the page and a user specified appearance of the plurality of objects to be printed on the page, by defining a plurality of bands for the page, each of the bands having a selected band size, the printer containing a conversion means to sequentially convert data corresponding to the plurality of bands into sequential bit-map data files corresponding to the plurality of bands for printing on the page, buffer storage means for temporarily storing the sequential bit-map data files until printed, and print means for sequentially printing the bit-map data bles on the page, the computer comprising:

storage means for storing the unprocessed data file;

rendering means for transforming said stored data file into bandable primitives for each band, said bandable primitives for each band corresponding to the plurality of objects and portions of the plurality of objects within that band, and for storing said bandable primitives in a manner indicative of a data processing sequence determined by the user specified appearance of the plurality of objects to be printed on the page;

dividing means for dividing said bandable primitives into sets of banded primitives corresponding to the bands to generate a set of banded primitives for each of the bands with each of said set of banded primitives describing only the plurality of objects and portions of the plurality of objects within the respective one of the corresponding bands, said set of banded primitives for each band maintaining said data processing sequence determined by the user specified appearance of the plurality of objects to be printed on the page; and

an interface to transfer said sets of banded primitives to the printer for printing, whereby the computer does not process said stored data file one time for each of the bands in order to generate the bit-map data files.

5,588,096

OBJECT IMAGE DISPLAY DEVICES

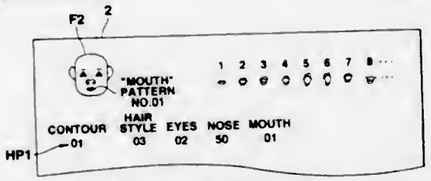
Shinichiro Sato; Syunsuke Akaza, Fussa, and Hiroyuki Yoshino, Higashiyamato, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 169,501, Dec. 16, 1993. This application May 15, 1996, Ser. No. 665,060

Claims priority, application Japan, Dec. 21, 1992, 4-340298; Dec. 30, 1992, 4-360896; Dec. 30, 1992, 4-360900

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—135 **7 Claims**



1. An object image display device comprising:

part image storage means for storing a plurality of groups of part images having different shapes, each of the groups corresponding to a respective one of a plurality of predetermined different parts which compose an object, a respective one of the part images of each of the groups being disposable at a position corresponding to one of the plurality of predetermined different parts of the object, said part image storage means also storing designating data for designating the respective part images;

object image storage means for selecting a plurality of part images from among the part images having different shapes of a corresponding one of the groups stored in said part image storage means, and for storing an object image of the object as a combination of the selected plurality of part images;

object image display means for displaying the object image stored in said object image storage means;

part image display means for reading from said part image storage means at least one group of different part images corresponding to at least one part of the object image displayed by said object image means, and for displaying the at least one read group of different part images;

select means for sequentially selecting part images to be successively changed and displayed from among the at least one group of different part images displayed by said part image display means;

designating data storage means for reading sequentially from said part image storage means designating data corresponding to the respective part images selected by said select means, and for storing the read designating data in order;

change start commanding means for initiating a start of successive changes of the respective part images selected by said select means; and

display control means responsive to said change start commanding means for sequentially reading out the designating data stored in order in said designating data storage means, for sequentially reading out from said part image storage means part images corresponding to the respective read designating data, and for sequentially substituting the read part images for the corresponding one of the object image displayed on said object image display means, to thereby display the resulting object image as if at least one of the part images of the resulting object image is moved successively.

5,588,097

GRAPHIC DISPLAY METHOD AND APPARATUS FOR ROTATING AN OBJECT IN THREE-DIMENSIONAL SPACE

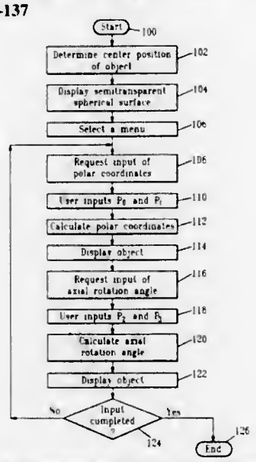
Makoto Ono, Yokohama, and Hiroshi Minakata, Tokyo, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1993, Ser. No. 22,252

Claims priority, application Japan, Mar. 4, 1992, 4-047303

Int. Cl.[6] G06T *17/40*

U.S. Cl. 395—137 **5 Claims**



1. A method of rotating an object being displayed in three-dimensional space by a graphic display apparatus, comprising the steps of:

displaying, on said display apparatus, a semitransparent spherical surface enclosing said object being displayed and having an origin;

specifying four points on said spherical surface,

a first one and a second one of said four specified points defining two pairs of polar surface coordinates in a polar coordinate system, and

a third one and a fourth one of said four specified points defining an angle α with respect to said second point;

computing a difference between said two pairs of polar surface coordinates;

performing a first calculation for rotating said object in said polar coordinate system in accordance with said computed difference;

performing a second calculation for rotating said object about an axis connecting said origin to said second point by said angle α; and

displaying, on said display apparatus, said object after being subjected to rotations in accordance with said first and second calculations.

5,588,098

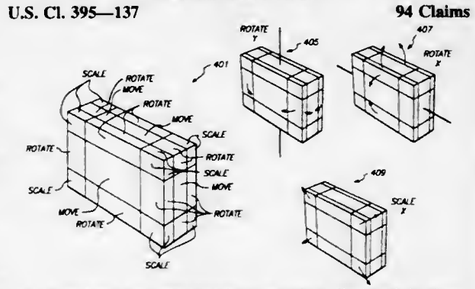
METHOD AND APPARATUS FOR DIRECT MANIPULATION OF 3-D OBJECTS ON COMPUTER DISPLAYS

Michael Chen, Mountain View, Calif.; Stephanie L. Houde, Cambridge, Mass., and Robert H. Seidl, Palo Alto, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 329,695, Oct. 26, 1994, abandoned, which is a continuation of Ser. No. 769,198, Nov. 22, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,405

Int. Cl.[6] G06T *17/40*

U.S. Cl. 395—137 **94 Claims**



1. A method for manipulating an object displayed in three-dimensional representation on a computer controlled display system having a computer and a display coupled to the computer, comprising the steps of:

a) providing a user actuated input controller signal for selectively positioning a reference indicator on the display;

b) positioning the reference indicator over the displayed object and signaling the computer to activate a control movement mode;

c) providing on the display a three-dimensional representation of a bounding region including at least two portions which specify respective predefined control movement types, one of said types being rotation around an axis parallel to the portion which specifies rotation around that axis;

d) positioning the reference indicator over one of said portions;

e) signaling the computer to activate a predefined control movement type specified by the portion of the bounding region under the reference indicator, and while the reference indicator is over said portion, repositioning the reference indicator to define a movement of the specified type; and

f) re-displaying the displayed object in accordance with the defined movement of the specified type.

5,588,099

METHOD AND SYSTEM FOR AUTOMATICALLY RESIZING TABLES

Alex Mogilevsky, and Kornel R. Marton, both of Redmond, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Sep. 1, 1994, Ser. No. 299,932

Int. Cl.[6] G06T *3/00*

U.S. Cl. 395—139 **26 Claims**

1. A method in a computer system for automatically resizing a table, the table having a plurality of columns, each column having a column width and a width of longest data, the method comprising the steps of:

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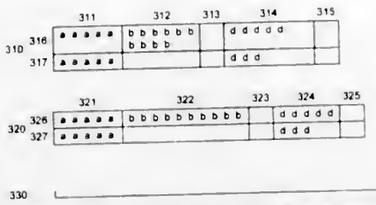


for each column in which the column width is greater than the width of the longest data, setting the column width to the width of the longest data; and

when a sum of the column widths of all the columns is greater than a specified width, proportionally decreasing the column width of each column so that the sum of the column widths of all the columns is equal to the specified width.

5,588,100

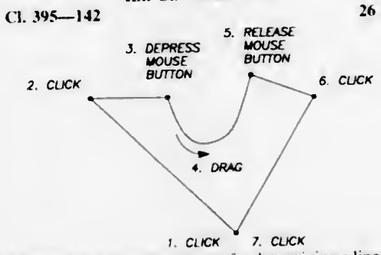
METHOD AND SYSTEM FOR CREATING A FREEFORM DRAWING OBJECT

David C. Parker, Menlo Park, Calif., assignor to Microsoft Corporation, Redmond, Wash.

Filed May 18, 1992, Ser. No. 884,392

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—142 **26 Claims**



1. A method in a computer system for determining a line type for each of a plurality of lines to be created, the line type being either freehand or polygonal, the computer system having a mouse with a button, the button having a released position and a depressed position, the method comprising the steps of:

detecting a first change in position of the button;

detecting movement of the mouse; and

after detecting movement of the mouse, detecting a second change in position of the button; and

after detecting the second change in position of the button,

when the button is in the released position, creating a line having a freehand line type; and

when the button is in the depressed position, creating a line having a polygonal line type.

5,588,101

BIT DATA PROCESSOR

Shigeru Ueda, Wako, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

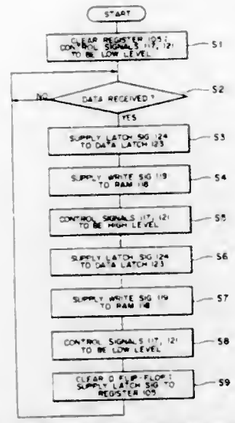
Division of Ser. No. 141,706, Oct. 27, 1993, which is a continuation of Ser. No. 750,696, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 378,489, Jul. 12, 1989, abandoned, which is a continuation of Ser. No. 875,564, Jun. 18, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 471,880

Claims priority, application Japan, Jun. 27, 1985, 60-138979

Int. Cl.[6] G06F *3/00;9/00*

U.S. Cl. 395—792 **10 Claims**

1. A method for storing dot pattern data representing a character pattern in a memory of which each address is bits of predetermined length, including the steps of:



receiving dot pattern data composed of a part of the character pattern and shift amount data representing an amount to be shifted for the dot pattern data;

generating a bit string of predetermined length as the dot pattern data shifted in accordance with the received dot pattern data and the received shift amount data;

designating an address of the memory at which the bit string of predetermined length generated in said generating step is to be written; and

writing the bit string of predetermined length at the address of the memory designated in said designating step, wherein when any bit string is already written at the designated address, the bit string as already written and the bit string of predetermined length generated in said generating step are combined and the thus-combined bit string of predetermined length is written at the address of the memory as designated in said designating step.

5,588,102

Patent Not Issued For This Number

5,588,103

DOCUMENT EDITOR HAVING FUNCTION FOR CONTROLLING DISPLAY PROCESSING OF DETAILS

Yoshihiko Aoyagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 14, 1994, Ser. No. 274,691

Claims priority, application Japan, Oct. 5, 1993, 5-249169

Int. Cl.[6] G06F *15/00*

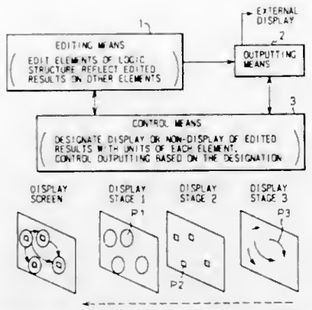
U.S. Cl. 395—326 **4 Claims**

1. A document editor for editing and displaying elements of a graphic with a logic structure including at least one of inclusive, side-by-side, and connective relationships, comprising:

editing means for editing at least one element of the graphic having the logic structure and obtaining a reflected result of the editing on other elements, said editing means including means for setting display stages and allocating the elements of the graphic to respective display stages;

output means, having a display unit, for displaying the reflected result of the editing; and

control means for selectively designating display or non-display in the respective display stages for each element of the



graphic having the logic structure associated with the respective display stages, including the reflected result of the editing, and for controlling, based on the designating, said display unit to display or not display the reflected result of the editing.

5,588,104

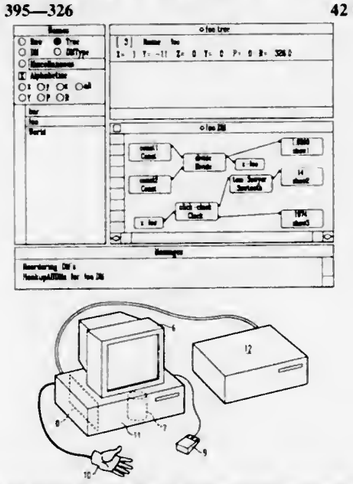
METHOD AND APPARATUS FOR CREATING VIRTUAL WORLDS USING A DATA FLOW NETWORK

Jaron Z. Lanier, Palo Alto; Ann Lasko-Harvill, San Mateo; Chuck L. Blanchard, Palo Alto, and Joe L. Sparks, San Francisco, all of Calif., assignors to VPL Research, Inc., Redwood City, Calif.

Continuation of Ser. No. 931,881, Aug. 13, 1992, abandoned, which is a continuation of Ser. No. 620,490, Nov. 30, 1990, abandoned. This application Oct. 4, 1994, Ser. No. 317,341

Int. Cl.[6] G06T *17/00*

U.S. Cl. 395—326 **42 Claims**



1. An apparatus for creating a virtual world, the virtual world including a virtual object which represents a physical object, wherein a first point of the virtual object represents a first part of the physical object and the first point moves in relation to second and third points of the virtual object which represent second and third parts of the physical object, wherein a movement of the first point is based on changes in inputs to a data flow network, the data flow network describing the movement of the first point in relation to the second and third points when the movement of the first point is not based on either one of a rotation and a translation of the virtual object, the apparatus comprising:

a computer display; and

means, connected to the computer display, for generating a data flow network for calculating a movement of a first point of a virtual object in a virtual world in relation to a second point and a third point of the virtual object when the movement is not based on either one of a rotation and a translation of the virtual object, the data flow network including a plurality of interconnected units, and the plurality of interconnected units including at least one input unit representing at least one source of input data for providing input data to the data flow network, a plurality of function units which transform the input data, and a plurality of output units each representing one dimension of a corresponding vector of the first point in a three-dimensional coordinate system, wherein the corresponding vector of the first point generates a first spatial position and a first orientation of the first point in the three-dimensional coordinate system in the virtual world.

5,588,105

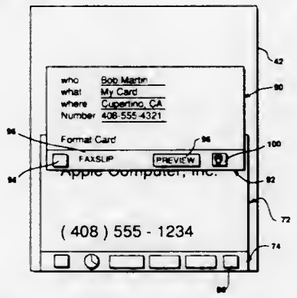
STATUS BAR FOR APPLICATION WINDOWS

Gregg S. Foster, Woodside, and Stephen P. Capps, San Carlos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 976,970, Nov. 16, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 393,880

Int. Cl.[6] G06F *3/14;3/033*

U.S. Cl. 395—326 **40 Claims**



1. A computer system for displaying a status bar for a window of an application program comprising:

a central processing unit (CPU);

read/write memory coupled to said CPU;

a computer screen coupled to said CPU;

means for selecting a status bar template from a plurality of predefined status bar templates, said selected status bar template to be associated with an application program, each of said plurality of status bar templates being able to provide a status bar for different application programs usable on said computer system and each template including a different number or type of active area;

means for providing a status bar from said selected status bar template independently of said application program and independently of an application window of said application program;

means for displaying said status bar on said computer screen such that said status bar is displayed external to said window and is visibly associated with a window of said application program which is also displayed on said computer screen, wherein said status bar is associated only with said application program and is always displayed when said window of said associated application program is displayed; and

means for displaying an active area within said status bar, said active area always being displayed within said status bar and being unable to be removed from said status bar while said

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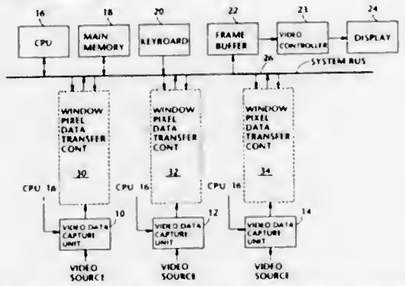
status bar is displayed, said active area including an icon or a label.

5,588,106

HARDWARE ARRANGEMENT FOR CONTROLLING MULTIPLE OVERLAPPING WINDOWS IN A COMPUTER GRAPHIC SYSTEM

Shinichi Habata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 16, 1993, Ser. No. 106,561
Int. Cl.[6] G06T *1/20*
U.S. Cl. 395—340 **7 Claims**



7. An arrangement for displaying a plurality of video images in multiple windows in a computer graphics system, comprising:

a processor configured to control an overall operation of said arrangement, said processor being coupled to a bus;

a frame buffer coupled to said bus and configured to store one frame video image to be displayed on a display;

a video controller operatively coupled to said frame buffer and configured to display said one frame video image stored in said frame buffer on said display;

a plurality of video capture units each coupled to said bus and respectively configured to acquire a plurality of video images into said arrangement;

a plurality of window pixel data transfer controllers respectively coupled between a corresponding one of said video capture units and said bus, said plurality of window pixel data transfer controllers being arranged to respectively define a plurality of windows and to respectively transfer a corresponding one of said video images to said frame buffer through a corresponding one of said windows, each of said plurality of window pixel data transfer controllers being arranged to determine an exposed portion of a corresponding one of said windows in a case where said corresponding one of said windows is overlapped by another one of said windows, said each of said window pixel data transfer controllers allowing the corresponding one of said video images to be supplied to said frame buffer through said exposed portion of said corresponding one of said windows,

wherein said video images are capable of being supplied to said frame buffer in parallel by said plurality of window pixel data transfer controllers, and

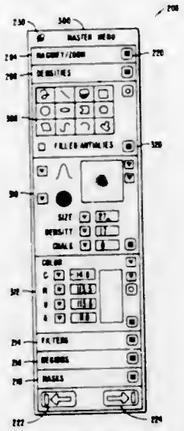
wherein each of said plurality of window pixel data transfer controllers receives successively corresponding windows defining data from said processor when each of said plurality of window pixel data transfer controllers defines said corresponding one of said windows, each of said plurality of window pixel data transfer controllers being respectively assigned a corresponding window identification number which is respectively applied to said plurality of window pixel data transfer controllers from said processor.

5,588,107

METHOD AND APPARATUS FOR SELECTABLY EXPANDABLE MENUS

Lori Bowden, Santa Rosa; Sharon L. Jochums, Sebastopol, and Erol Otus, El Cerrito, all of Calif., assignors to Island Graphics Corporation, San Rafael, Calif.

Filed Mar. 22, 1993, Ser. No. 35,460
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—344 **20 Claims**



1. A method for presenting and selecting menu options on a display of a computer system having a processor and an input device, the method comprising the steps of:

bounding a panel region on the display, by use of the processor, into a plurality of menu panels, each menu panel comprising a menu option, said plurality of menu panels having a position relationship to each other;

operating the input device to select a first particular one of said plurality of menu panels comprising a first particular one menu option; and

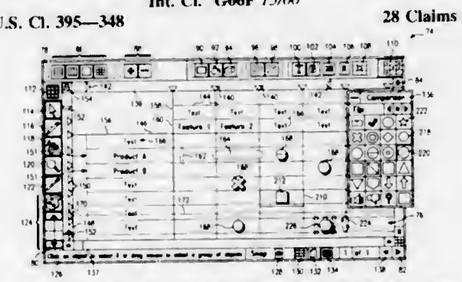
expanding said first particular one menu panel to present a first expanded menu panel having options associated with but excluding said first particular one menu option, said first expanded menu panel presented in place of said first particular one menu panel while maintaining said position relationship of said plurality of menu panels.

5,588,108

SYSTEM AND METHOD FOR GENERATING GRAPHICS CHARTS

Pramathesh Kumar, Mountain View; Matthias Grabiak, Oakland, and Ivan Ivanek, Sausalito, all of Calif., assignors to Micrografx, Inc., Richardson, Tex.

Filed Sep. 27, 1994, Ser. No. 314,041
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—348 **28 Claims**



1. A method for generating computer graphics on a computer display with a computer having a processor, the method comprising the steps of:

generating on the display an adjustable grid associated with each type of graphics chart, each grid providing predetermined placement positions for text and shapes on each type of graphics chart; and

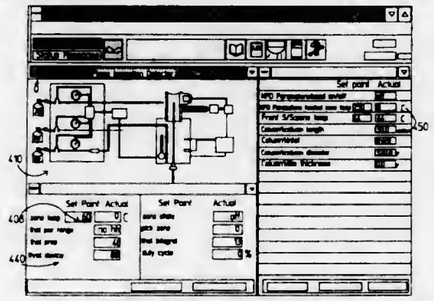
providing snap zones associated with each grid for controlling the orientation of the shapes and text placed on the grid.

5,588,109

USER INTERFACE FOR A REMOTE DIAGNOSTIC DEVICE

Ian J. Dickinson, Wilmington, Del.; Horst Eichberger, Karlsbad, Germany; David W. Messaros, Wallingford, Pa., and Hans-Dieter Walter, Ditzingen, Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1995, Ser. No. 376,720
Int. Cl.[6] G06F *3/00;3/14*
U.S. Cl. 395—326 **19 Claims**



1. An apparatus for remote diagnostics of an instrument, comprising:

a computer for executing a software application program which provides for communication of commands from the computer to the instrument, and the communication of information accessed from the instrument in response to the commands, the computer further comprising:

a graphical user interface comprising a plurality of interrelated windows for displaying the accessed information, wherein, displaying information in one window effects the display of information in at least one other window, the interrelated windows further comprising:

an instrument schematic window providing a graphical depiction of the instrument in which the instrument is the combination of a plurality of components, each of which may be accessed individually,

an instrument variables window for displaying the current output value of the accessed components;

a memo pad window for displaying those output values of the accessed components which have been identified for continuous review even though they may not be currently displayed in the instrument schematic window.

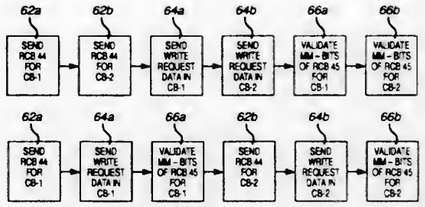
5,588,110

METHOD FOR TRANSFERRING DATA BETWEEN TWO DEVICES THAT INSURES DATA RECOVERY IN THE EVENT OF A FAULT

Rodney A. DeKoning; Donald R. Humlicek, and Max L. Johnson, all of Wichita, Kans., assignors to Symbios Logic Inc., Fort Collins, Colo.

Filed May 23, 1995, Ser. No. 447,377
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—182.03 **31 Claims**

1. A method of insuring recovery of a quantity of write request data in a computer system having a host device and a storage device, with the storage device having a first controller and a second controller, comprising the steps of:



transferring the write request data from said host device to said first controller so as to store the write request data therein;

allocating a memory area in said second controller for use by said first controller; and

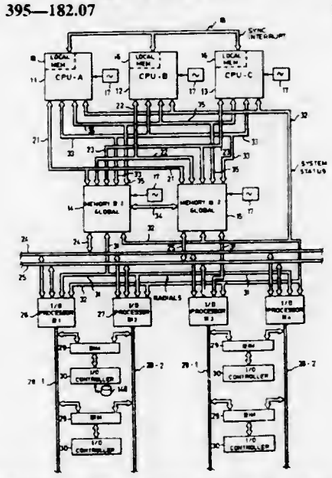
maintaining a control block in said second controller for indicating status of the write request data stored in said first controller.

5,588,111

FAULT-TOLERANT COMPUTER SYSTEM HAVING SWITCHABLE I/O BUS INTERFACE MODULES

Richard W. Cutts, Jr., Georgetown; Randall G. Banton, and Douglas E. Jewett, both of Austin, all of Tex., assignors to Tandem Computers, Incorporated, Cupertino, Calif.

Continuation of Ser. No. 84,869, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 664,495, Mar. 5, 1991, Pat. No. 5,276,823, which is a continuation of Ser. No. 283,574, Dec. 13, 1988, abandoned. This application Jan. 31, 1995, Ser. No. 381,467
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—182.07 **14 Claims**



1. A fault tolerant computer system to Input/Output (I/O) data to an external device, the external device having an I/O device controller associated therewith, the I/O device controller coupled to a non-duplicated I/O bus, comprising:

a plurality of Central Processor Units (CPUs) executing the same instruction stream;

first and second I/O processors, each coupled to be accessible by all of said CPUs;

first and second I/O busses coupled to said first and second I/O processors, respectively;

a bus interface module, coupled to the non-duplicated I/O bus of said I/O device controller, wherein the bus interface module also is coupled to both of said first and second I/O busses;

wherein the I/O device controller is coupled to said first I/O bus via said bus interface module, and wherein said bus interface

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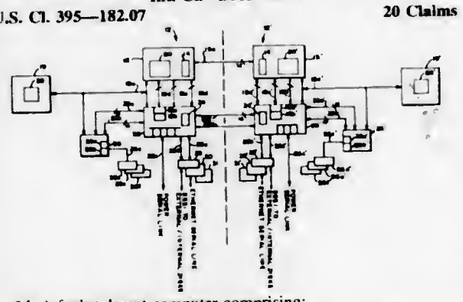
module includes means for switching to the second I/O bus so that said I/O device controller is coupled to the second I/O bus, in response to an indication of a fault.

5,588,112

DMA CONTROLLER FOR MEMORY SCRUBBING

Glenn Dearth, Groton, and Thomas D. Bissett, Northboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 998,717, Dec. 30, 1992, abandoned. This application Feb. 20, 1996, Ser. No. 603,968
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.07 **20 Claims**



14. A fault tolerant computer comprising:

a first computing zone comprising:

a first direct memory access (DMA) controller, said first controller comprising:

first means for storing an address of a location in memory for which an error in data read from said location is detected;

first means for reading said location in memory, for correcting said error in data read from said location, and for writing said corrected data back to said memory location;

a second computing zone, comprising

a second direct memory access (DMA) controller, said second controller comprising:

second means for storing an address of a location in memory for which an error in data read from said location is detected;

second means for reading said location in memory, for correcting said error in data read from said location, and for writing said corrected data back to said memory location; and

means for synchronizing the correction of the memory in the first zone with correction of the memory in the second zone.

5,588,113

REGISTER FILE BACKUP QUEUE

Anders R. Johnson, Fremont, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 846,237, Mar. 5, 1992, Pat. No. 5,398,330. This application Mar. 13, 1995, Ser. No. 403,527
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—182.13 **14 Claims**

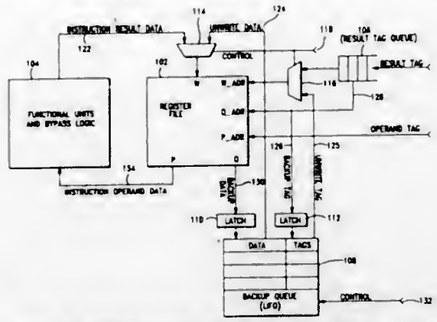
1. A computer system which processes instructions to generate results which thereby change the visual state of the computer system comprising:

a memory;

a bus coupled to said memory; and

a register file coupled to said bus with a plurality of addressable locations for storing result data; and

a register file backup system, coupled to said bus, adapted to return a visual state of the computer system to a previous state if an instruction generates an exception, said register file



backup system utilizing less overhead so as to provide easier register file backup than a comparable software or hardware device, said register file backup system comprising:

a first-in, first-out result tag queue that sequentially stores in program order, address information corresponding to destination locations in said register file where instruction results are to be stored, said first-in, first-out result tag queue having first and second outputs for transferring said address information stored therein,

(a) said first output coupled to the register file for transferring a first destination location to said register file, and

(b) said second output for transferring a second destination location to said register file; a last-in, first-out backup queue, coupled to

(i) said second output of said first-in, first-out result tag queue, for receiving and storing said second destination location, and

(ii) the register file, for receiving and backup storing backup data corresponding to contents of said second destination location in the register file before that destination location is changed; and

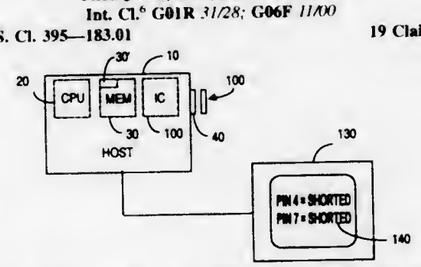
means for transferring said backup data from said last-in, first-out backup queue back to said register file locations according to said second portion of said address information stored in said last-in first-out backup queue means after an instruction generates an exception.

5,588,114

METHOD AND APPARATUS FOR PASSIVE LOOPBACK TESTING OF SOFTWARE-CONTROLLABLE PARALLEL PORTS

Pradeep H. Bhatia, Salem, N.H., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 6, 1995, Ser. No. 499,016
Int. Cl.[6] G01R *31/28;* **G06F** *11/00*
U.S. Cl. 395—183.01 **19 Claims**



1. A passive device for testing integrity of a software-controllable output parallel port and output parallel port connector pins in a host device, comprising:

a test connector, sized to matingly engage said output parallel port connector pins;

said test connector having an AUTOFEED pin and a FAULT pin coupled-together to form a first loop-back connection, an

INITIALIZE pin and a SELECT pin coupled-together to form a second loop-back connection, a SELECT IN pin and a PRINTER ERROR pin coupled-together to form a third loop-back connection, and a STROBE pin and a BUSY pin coupled-together to form a fourth loop-back connection, and further having SIGNAL GROUND pins coupled to ground;

a passive logic unit coupled to logically-OR DATA control line pins on said test connector and to passively provide a logical-OR output signal to an ACKNOWLEDGE pin on said test connector;

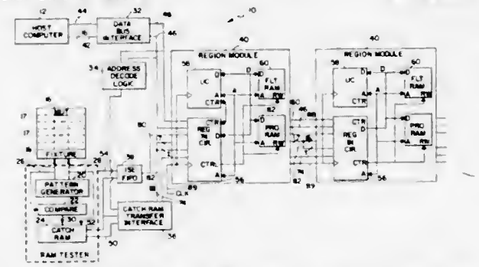
wherein during a test mode, combinations of "0" and "1" signals provided by said host device to said test connector result in a signal at said ACKNOWLEDGE pin of said test connector enabling said output parallel port to be tested for at least one condition selected from the group consisting of (i) open pins, (ii) shorted-to-ground pins, and (iii) shorted-to-power supply pins.

5,588,115

REDUNDANCY ANALYZER FOR AUTOMATIC MEMORY TESTER

Michael H. Augarten, Newbury Park, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Jan. 29, 1993, Ser. No. 11,003
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—183.05 **28 Claims**



1. Memory test apparatus for testing a memory under test (MUT) formed from physical structures which define a plurality of storage locations organized into a plurality of regions, said apparatus comprising:

a) means for testing the plurality of storage locations in the MUT and generating fault signals indicating which of the plurality of storage locations in the MUT is faulty,

b) a plurality of region modules, each said module having an input, and each said region module comprising:

i) a region fault RAM storing data,

ii) analysis means, connected to said region fault RAM, for analyzing the data in the region fault RAM to identify faulty structures within the MUT, and

iii) input means, coupled to the input of the region module and the region fault RAM, for storing information from the input to the region fault RAM, and

c) interface means, having an input connected to the means for testing and a plurality of outputs, each output coupled to a region module, for routing fault signals indicating a faulty location to the input of a region module which is selected based on the region of the MUT which contains the faulty location.

5,588,116

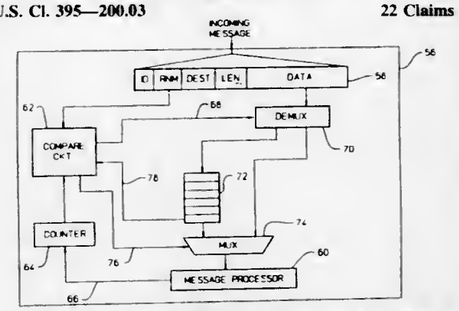
Patent Not Issued For This Number

5,588,117

SENDER-SELECTIVE SEND/RECEIVE ORDER PROCESSING ON A PER MESSAGE BASIS

Alan H. Karp, Palo Alto; Ming C. Hao, Los Altos Hills, and Rajiv Gupta, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 23, 1994, Ser. No. 247,387
Int. Cl.[6] G06F *13/14;13/24*
U.S. Cl. 395—200.03 **22 Claims**



1. An apparatus having a mixed-mode communications protocol that enables a sending application to select whether a particular message is to be processed in send order mode, or receive order mode, relative to other messages, comprising:

a sending portion that sends a sequence of messages to a destination, including a particular message formatted to include a data field representing desired order of processing relative to other messages of the sequence;

wherein the data field includes

sequence information, which identifies the particular message relative to the other messages in the sequence, and

desired queue information, which indicates to the receiving portion that the corresponding message is to be queued until a predetermined number of messages of the sequence have been processed;

a receiving portion at the destination that receives the messages of the sequence and places them in a receiver-maintained order, but that processes the particular message in the order indicated by the desired queue information, the receiving portion including

a comparator that compares, for the particular message, the desired queue information with an indicator of number of messages before the particular message in the receiver-maintained-order, and provides an output, and

a message processor, operatively connected to the comparator, the message processor processing the particular message in response to the output of the comparator; and

wherein the particular message is processed in send-order mode by selectively setting the desired queue information to correspond to a number of prior messages in the sequence which are to be processed first, and in receive order mode by selectively setting the desired queue information to have a value indicating that no prior messages in the sequence are to be processed first.

5,588,118

SINGLE CHIP DUAL PROCESSOR

Babu S. Mandava, Campbell, and E. Eugene Weddle, San Jose, both of Calif., assignors to Zilog, Inc., Campbell, Calif.

Continuation of Ser. No. 748,257, Aug. 21, 1991, abandoned. This application Dec. 23, 1994, Ser. No. 363,481
Int. Cl.[6] G06F *15/16;3*
U.S. Cl. 395—200.05 **7 Claims**

1. A method of providing, from a single computer program, program instructions to be executed by a first processor to said first processor and program instructions to be executed by a second processor to said second processor, comprising:

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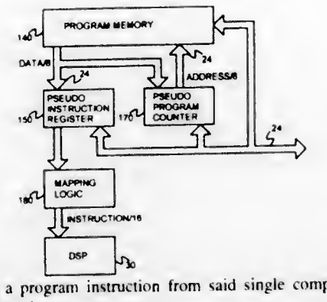


reading a program instruction from said single computer program; and

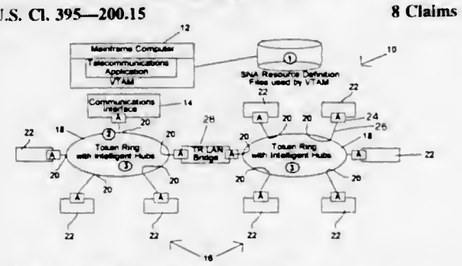
storing, if said program instruction is an opcode instruction of said first processor, said program instruction into an instruction register of said first processor, and storing, if said program instruction is a load data instruction of said first processor, data associated with said load data instruction into a pseudo instruction register accessible to said second processor, wherein said data loaded into said pseudo instruction register corresponds to a program instruction to be executed by said second processor.

5,588,119

METHOD FOR CORRELATING LOGICAL DEVICE NAMES WITH A HUB PORT IN A LOCAL AREA NETWORK

Ronald Vincent, 3803-B2 Rolling Green Ct., Raleigh, N.C. 27604; Marshall Sprague, 5979 Dixon Dr., Raleigh, N.C. 27609, and Duncan Hare, 2600 Sherrill Parke Ct., Richardson, Tex. 75082

Filed Aug. 23, 1993, Ser. No. 110,507
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.15 **8 Claims**



8. A local area SNA network comprising:

(a) a communications media including one or more intelligent hubs, each of which has a plurality of hub ports, said hub including means for obtaining therefrom hub port identification data and adapter addresses assigned to a plurality of connected devices;

(b) said plurality of devices connected by said communication media to respective hub ports, each said device including data transmission and receiving means for communicating with other devices on the network by transmitting and receiving SNA data in frames;

(c) data storage means in a device connected to the network, said data storage means containing a resource definition file having SNA logical names and XID numbers for said devices connected to the network;

(d) processing means in at least one of said devices connected to the network for:

(1) extracting the SNA logical name and XID numbers from the resource definition file;

(2) extracting XID numbers and corresponding adapter addresses from the frames transmitted on the network;

(3) correlating the adapter addresses from the transmitted frames with the SNA logical names by comparing the XID numbers extracted from the resource definition file with the XID numbers extracted from the transmitted frames;

(4) obtaining the hub port identification data and corresponding adapter address from the intelligent hubs; and

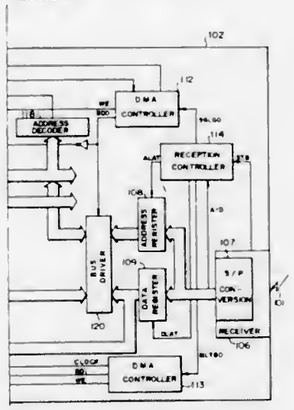
(5) correlating the hub port identification data with a corresponding SNA logical name by comparing the adapter address extracted from the transmitted frames with the adapter address obtained from the hub.

5,588,120

COMMUNICATION CONTROL SYSTEM FOR TRANSMITTING, FROM ONE DATA PROCESSING DEVICE TO ANOTHER, DATA OF DIFFERENT FORMATS ALONG WITH AN IDENTIFICATION OF THE FORMAT AND ITS CORRESPONDING DMA CONTROLLER

Yasuharu Shitara, Ashikaga; Noboru Hayasaka, Oizumi-machi, and Toshiya Kosuka, Chiyoda-machi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 316,830, Oct. 3, 1994, Pat. No. 5,430,844.
This application Apr. 20, 1995, Ser. No. 425,620
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.15 **16 Claims**



1. A communication control system comprising:

A) a transmission side communication control device including a transmitter for transmitting information in one of first and second formats, said transmission side communication control device comprising means for adding an identification bit to information to be transmitted by said transmitter, the identification bit identifying the format,

B) a receiving side communication control device comprising:

a) a receiver for receiving the information transmitted from said transmitter;

b) a first memory for storing information received by said receiver;

c) a second memory for storing information received by said receiver;

d) a first direct memory access control means for controlling writing of received information into the first memory;

e) a second direct memory access control means for controlling writing of received information into the second memory; and

f) selection control means for judging whether information received by said receiver is in either the first format or second format, based on the identification bit added to said information, said selection control means being adapted to initiate control by the first direct memory access control means if the information is in the first format and to initiate control by the second direct memory access control means if the information is in the second format, and

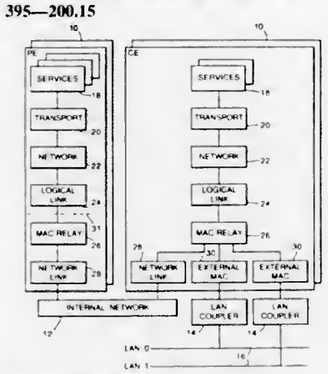
C) a communication cable connected between said transmitter and said receiver, said cable having a first end connected to said transmission side communication control device and a second end connected to said receiving side communication control device.

5,588,121

PARALLEL COMPUTER HAVING MAC-RELAY LAYER SNOOPED TRANSPORT HEADER TO DETERMINE IF A MESSAGE SHOULD BE ROUTED DIRECTLY TO TRANSPORT LAYER DEPENDING ON ITS DESTINATION

Timothy G. Reddin, Stockport; David S. Walsh, Rossendale, and Jeremy S. Round, Warrington, all of Great Britain, assignors to International Computers Limited, London, England

Continuation of Ser. No. 176,784, Jan. 3, 1994, abandoned.
This application May 9, 1996, Ser. No. 647,192
Claims priority, application United Kingdom, Jan. 19, 1993, 9300942
Int. Cl.[6] G06F *13/00;13/14*
U.S. Cl. 395—200.15 **4 Claims**



1. A parallel computer system comprising:

(a) at least one processing element including a protocol stack comprising a transport layer, a network layer, a logical link layer, a MAC-relay layer, and a network link layer;

(b) at least one communication element including a protocol stack comprising a transport layer, a network layer, a logical link layer, a MAC-relay layer, a network link layer, and an external MAC layer;

(c) an internal network interconnecting said processing element and said communication element for transmitting messages between said communication element and said processing element; each of said messages including transport header and MAC-relay header; and

(d) an external network coupled to said communication element with some other communication elements, for transmitting messages destined for said communication element and for said processing element, each of said messages including a transport header, a logical link header, and a MAC header;

(e) wherein said MAC layer and said MAC-relay layer in said communication element includes:

(i) means for receiving a message from said external network by said MAC layer;

(ii) means for snooping on the transport header of said message by said MAC-relay layer to find whether the message is destined for service by the transport layer in the communication element or for service by the transport layer in the processing element;

(iii) means operative in the event that the message is destined for service by the transport layer in the communication element, for routing the message through the logical link layer and the network layer in the communication element to the transport layer in the communication element; and

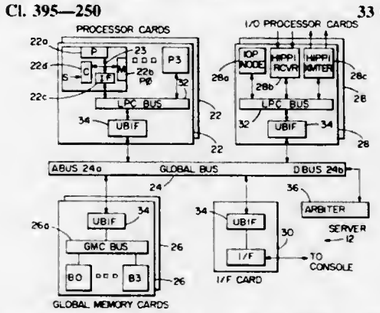
(iv) means operative in the event that the message is destined for service by the transport layer in the processing element, for routing the message to the transport layer of the processing element over said internal network directly without going through the logical link layer and the network layer in the communication element in accordance with said transport header and a newly built MAC-relay header added to said message by said MAC-relay layer.

5,588,122

UNIVERSAL BUFFERED INTERFACE FOR COUPLING MULTIPLE PROCESSORS MEMORY UNITS, AND I/O INTERFACES TO A COMMON HIGH-SPEED INTERCONNECT

Armando Garcia, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 734,206, Jul. 22, 1991, abandoned.
This application Jun. 15, 1994, Ser. No. 260,107
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—250 **33 Claims**



1. Interface circuitry for use in a data processing system, said interface circuitry forming an interface unit and comprising:

first interface means for coupling to a plurality of signal lines of a local bus, the local bus having a plurality of local bus agents coupled thereto, said local bus and said plurality of local bus agents being disposed external to said interface unit;

second interface means for coupling to a plurality of signal lines of a global bus, the global bus having a plurality of global bus agents coupled thereto, said global bus and said plurality of global bus agents being disposed external to said interface unit;

a plurality of input queue means each having an input coupled to the second interface means for receiving at least control information and data information from said global bus through the second interface means, each of the input queue means having an output coupled to the first interface means; and

a plurality of output queue means each having an input coupled to the first interface means for receiving address information, control information, and data information from said local bus through the first interface means, each of the output queue means having an output coupled to the second interface means; wherein

individual ones of the plurality of local bus agents each have dedicated thereto an individual one of the input queue means and an individual one of the output queue means for receiving information from the global bus and for transmitting information to the global bus, respectively; and wherein

the second interface means includes means for selectively coupling an output of the second interface means to an input of the first interface means for bypassing the input queue means when the input queue means is empty.

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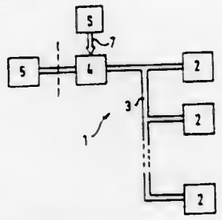
5,588,123
BUS SYSTEM

Josef Loibl, Regen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 26, 1994, Ser. No. 249,540
Claims priority, application European Pat. Off., Nov. 26, 1991, 91120166
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—287 **11 Claims**



1. A bus system, comprising:

a plurality of control devices;

a bus interconnecting said control devices, said control devices exchanging data via said bus;

a central device;

said central device reading out data transmitted on said bus, evaluating the data and generating items of information from the data;

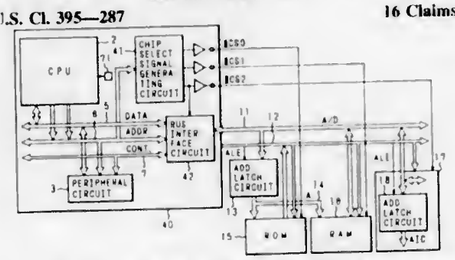
said central device outputting the items of information through said bus as messages with a low transmission repetition frequency; and

said control devices extracting the items of information from said bus as individually required.

5,588,124
MICROCOMPUTER

Katsunobu Hongo, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 351,000
Claims priority, application Japan, Nov. 29, 1993, 5-298087
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—287 **16 Claims**



1. A microcomputer to be connected with external circuits having different access cycles via a multiplex bus which transfers an address/data signal and control signals, comprising:

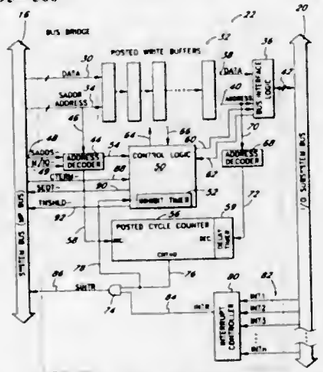
a means for generating a first control signal having a first level when a first external circuit is to be accessed, and otherwise having a second level; and

a control signal generating circuit responsive to said first control signal, for generating a second control signal when another external circuit is to be accessed, said second control signal changing from said second level to said first level at a different time than said first control signal.

5,588,125
METHOD AND APPARATUS FOR INCREASING BUS BANDWIDTH ON A SYSTEM BUS BY INHIBITING INTERRUPTS WHILE POSTED I/O WRITE OPERATIONS ARE PENDING

Brian R. Bennett, Laguna Niguel, Calif., assignor to AST Research, Inc., Irvine, Calif.

Continuation of Ser. No. 139,468, Oct. 20, 1993, abandoned.
This application Mar. 24, 1995, Ser. No. 410,560
Int. Cl.[6] G06F *13/38;9/46*
U.S. Cl. 395—306 **14 Claims**



1. A method of increasing the bus bandwidth on a system bus in a computer system having a processor and a plurality of input/output (I/O) devices on an I/O bus, said system bus coupled to said I/O bus via a bus bridge such that said processor may communicate on said system bus independently of I/O activities on said I/O bus, said processor being able to communicate with said I/O devices on said I/O bus via said bus bridge, said computer system further comprising an interrupt controller having an output which propagates interrupts to said processor from said I/O devices, said method comprising the steps of:

posting a write operation from said processor directed to said I/O bus in said bus bridge;

inhibiting said output from said interrupt controller to preclude interrupts from propagating from said I/O bus to said system bus while said write operation is posted in said bus bridge;

transferring said posted write operation from said bus bridge to said I/O bus; and

uninhibiting said output from said interrupt controller to allow said interrupts to propagate from said I/O bus to said system bus after said write operation is transferred from said bus bridge to said I/O bus.

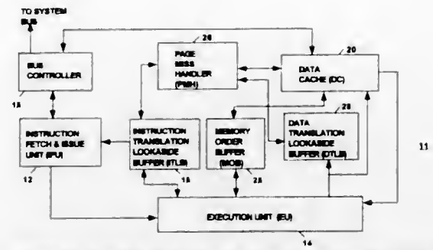
5,588,126
METHODS AND APPARATUS FOR FORDWARDING BUFFERED STORE DATA ON AN OUT-OF-ORDER EXECUTION COMPUTER SYSTEM

Jeffrey M. Abramson, Aloha; Haitham Akkary, Portland; Andrew F. Glew, Hillsboro; Glenn J. Hinton; Kris G. Konigsfeld, both of Portland; Paul D. Madland, and David B. Papworth, both of Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 176,111, Dec. 30, 1993, abandoned. This application May 19, 1995, Ser. No. 446,030
Int. Cl.[6] G06F *9/30*
U.S. Cl. 395—376 **8 Claims**

1. An apparatus comprising:

a first buffer having a first plurality of buffer slots for buffering a plurality of memory store operations (STs) issued over a period of time for execution, potentially in an out-of-order (OOO) manner, each of said buffered STs including at least a store opcode, a store address and store data, and said first



plurality of buffer slots being allocated to said buffered STs in a circular wraparound manner;

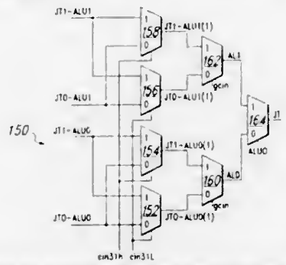
a second buffer having a second plurality of buffer slots for correspondingly storing a plurality of allocation states of said first buffer for a plurality of memory load operations (LDs) issued for execution, also potentially in an OOO manner, each LD including at least a load opcode and a load address, each of said allocation states identifying the allocation state of said first buffer at the time the corresponding LD is issued;

circuitry coupled to said first and second buffers for conditionally signaling said store buffer to output store data of one of said buffered STs on behalf of a buffered LD, and identifying the store data to be output for said store buffer, when the buffered LD is being executed, said circuitry including one of said allocation states that is corresponding to the buffered LD being executed as inputs, in determining whether said store buffer is to be signaled and identifying the appropriate store data to be output.

5,588,127
HIGH SPEED MICROPROCESSOR BRANCH DECISION CIRCUIT

Patrick W. Bosshart, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 953,637, Sep. 29, 1992, Pat. No. 5,270,955. This application Jun. 7, 1995, Ser. No. 477,002
Int. Cl.[6] G06F *9/302;9/305;9/34*
U.S. Cl. 395—376 **20 Claims**



16. A circuit for providing a branch decision signal comprising:

a. an arithmetic logic unit carrying out an arithmetic logic operation, said arithmetic logic unit having as outputs a plurality of alu status signals, each alu status signal having at least two unique states, said plurality of alu status signals including a late arriving first alu status signal available from said arithmetic logic unit last among said plurality of alu status signals, said arithmetic logic unit having N bits, where N is an integer greater than one, said arithmetic logic unit consisting of an N-1 bit arithmetic logic unit having the architecture of an N bit arithmetic logic unit without carry-in and a 1 bit most significant bit arithmetic logic unit;

b. a first candidate branch decision circuit, said first candidate decision circuit being operable to compute a first candidate branch decision signal based upon said first alu status signal prior to availability of said first alu status signal from said arithmetic logic unit by assuming a first candidate value for said first alu status signal;

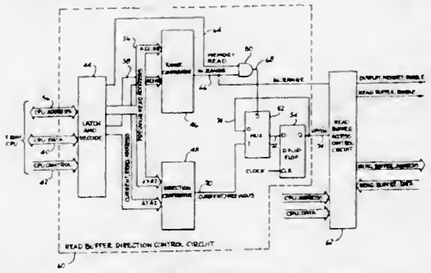
c. a second candidate branch decision circuit, said second candidate decision circuit being operable to compute a second candidate branch decision signal based upon said first alu status signal prior to availability of said first alu status signal from said arithmetic logic unit by assuming a second candidate value for said first alu status signal, said second candidate value being a different unique state from said first candidate value;

d. a first selection circuit for selecting from said first branch decision signal and said second branch decision signal, based upon an actual value of said first alu status signal when received from said arithmetic logic unit, the output of said first selection circuit being said branch decision signal.

5,588,128
DYNAMIC DIRECTION LOOK AHEAD READ BUFFER

Gary D. Hicok, Mesa, Ariz.; Eric A. Hildebrandt, and Micheal H. Zhu, both of San Jose, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 42,323, Apr. 2, 1993, abandoned.
This application Feb. 27, 1996, Ser. No. 607,372
Int. Cl.[6] G06F *12/08;13/00*
U.S. Cl. 395—414 **11 Claims**



1. A look ahead read buffer comprising, in combination:

memory means for storing data;

control circuitry means coupled to said memory means for writing said data into said memory means in a sequential order and for reading said data out of said memory means in a read sequence in said sequential order, said sequential order being determined by a sequence of sequential addresses corresponding to locations of said data; and

dynamic direction means within said control circuitry means for changing direction of said read sequence from a first state to a second state and from said second state to said first state, said first state corresponding to an ascending sequence of said sequential addresses and said second state corresponding to a descending sequence of said sequential addresses, said dynamic direction means comprising:

range comparator means for comparing a first portion of a previous read address with a first like portion of a current read address, and having a range output in a true logic state when said first portion of said previous read address is equal to said first like portion of said current read address, and having said range output in a false logic state when said first portion of said previous read address is not equal to said first like portion of said current read address;

directional comparator means for comparing a second portion of said previous read address with a second like portion of said current read address, and having a direction output in a first logic state when said second portion of said previous read address is less than said second like portion of said current read address, and having said direction output in a second logic state when said second portion of said previous read address is not less than said second like portion of said current read address; and

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logic means coupled to said range output and to said direction output for generating an UP/DOWN output indicating said prefetch direction, said UP/DOWN output reflecting the logic state of said direction output when said range output is in said true logic state.

5,588,129

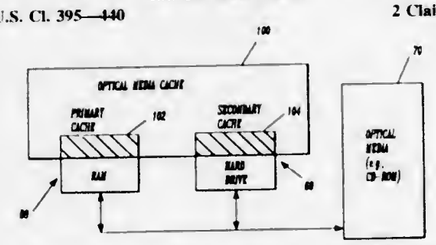
CACHE FOR OPTICAL STORAGE DEVICE AND METHOD FOR IMPLEMENTING SAME

Clinton L. Ballard, 4721 NW. Blackhawk Ct., Bremerton, Wash. 98312

Continuation of Ser. No. 193,991, Feb. 9, 1994, abandoned. This application Jan. 16, 1996, Ser. No. 585,808

Int. Cl.[6] G06F *12/16*

U.S. Cl. 395—440 **2 Claims**



1. A cache apparatus for storing data for a plurality of optical disk storage media alternatively loadable into a common optical disk drive, the apparatus comprising:

volatile memory and non-volatile memory for storing disk data read from the plurality of optical disk storage media, the volatile memory serving as a primary cache and the non-volatile memory serving as a secondary cache, the secondary cache comprising a portion of a

a plurality to a respective optical disk identification codes stored in non-volatile memory and corresponding to a plurality of optical disk storage media alternatively loadable into the common optical disk drive, each identification code unique to a corresponding optical disk storage media;

an index stored in non-volatile memory pointing among said plurality of identification codes to a currently accessible optical disk storage media;

a first data structure stored in non-volatile memory for mapping at least a portion of said disk data stored in the non-volatile memory to corresponding address locations on an associated optical disk storage media, said first data structure comprising a first tag associated with first disk data read from a first optical disk storage media and a second tag associated with second disk data read from a second optical disk storage media; and

a digital processing means allocating the nonvolatile memory no comprise:

a second data structure for storing disk data, the stored disk data in the second data structure being organized into a plurality of groups of disk data, and wherein only one group of the plurality of groups of disk data is active at one time, each one group being a physically contiguous sector area within the non-volatile memory;

a third data structure for storing a plurality of markers and a corresponding plurality of optical disk sector addresses, each marker of said plurality of markers corresponding to a group of

said plurality of grouses of cached data; and the digital processing means allocating the volatile memory to comprise a fourth data structure for storing a portion of the disk data stored in the second data structure of the nonvolatile memory; the digital processing means processing a request to read disk data from an optical disk storage media fin a and comprising:

(i) means for defining the index pointing among said plurality of identification codes which corresponds to a current optical disk storage media;

(ii) means for accessing the first data structure to identify whether disk data is stored in non-volatile memory; and

(iii) means for retrieving first disk data from said non volatile memory without first re-storing said first disk data from said first optical disk storage media into the non-volatile memory following changes in the current optical disk storage media away from the first optical disk storage media and back to the first optical disk storage media, when said disk data is stored in said non-volatile memory; and

said digital processing means executing a first computer program for covering stored disk data after a restoration of power, and further comprising:

(iv) means for determining one marker of the plurality of markers as being invalid and each other marker of the plurality of markers as being valid by scanning among the plurality of markers to identify a last valid marker before said one invalid marker;

(v) means for defining a next marker unique to all valid markers in said third data structure, wherein said next marker is an increment of said last valid marker;

(vi) means for deriving a next location in the second data structure corresponding to said next marker for storing disk data.

5,588,130

SEMICONDUCTOR MEMORY DEVICE FOR SIMPLE CACHE SYSTEM

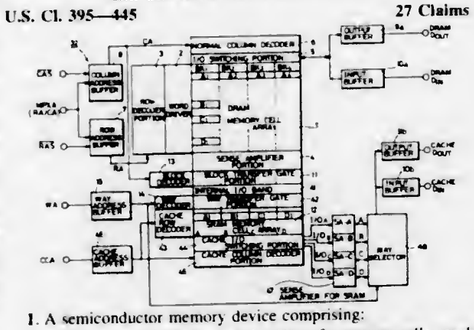
Kazuyasu Fujishima; Yoshio Matsuda, and Mikio Asakura, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 63,487, May 19, 1993, Pat. No. 5,353,427, which is a division of Ser. No. 564,657, Aug. 9, 1990, Pat. No. 5,226,147, which is a continuation of Ser. No. 266,601, Nov. 3, 1988. This application Aug. 1, 1994, Ser. No. 283,367

Claims priority, application Japan, Nov. 6, 1987, 62-281619; Dec. 17, 1987, 62-322126

Int. Cl.[6] G06F *13/00;* **G11C** *15/00*

U.S. Cl. 395—445 **27 Claims**



1. A semiconductor memory device comprising:

a main memory including a plurality of memory cells, each storing information, arranged in a plurality of rows and a plurality of columns, said main memory being divided into a plurality of blocks in the unit of a plurality of columns, each block being formed on a semiconductor substrate in a physically gathered manner, a boundary region being provided between adjacent blocks on said semiconductor substrate, and

a cache memory including a plurality of storage elements arranged in a plurality of rows for storing in block units information read out in block units from said main memory.

5,588,131

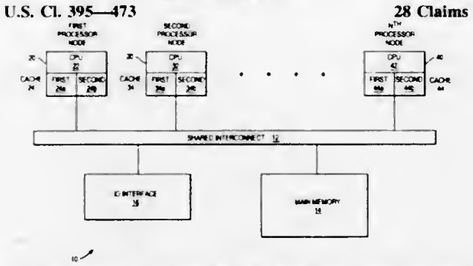
SYSTEM AND METHOD FOR A SNOOPING AND SNARFING CACHE IN A MULTIPROCESSOR COMPUTER SYSTEM

Paul L. Borrill, Cupertino, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 9, 1994, Ser. No. 208,170

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—473 **28 Claims**



1. An apparatus configured to be inserted into a multiprocessor system having a plurality of data elements and a plurality of processor nodes coupled together by a shared interconnect, the shared interconnect configured to carry a plurality of data elements, the apparatus comprising:

a processor node;

a cache configured to cache a group of the plurality of data elements for the processor node; and

a snarfing mechanism, coupled to the cache, the snarfing mechanism, when inserted into the multiprocessor system, configured to check the cache to determine if the cache contains a copy of a data element appearing on the shared interconnect, and further programmed to snarf the data element off the shared interconnect if the cache has no copy of the data element.

5,588,132

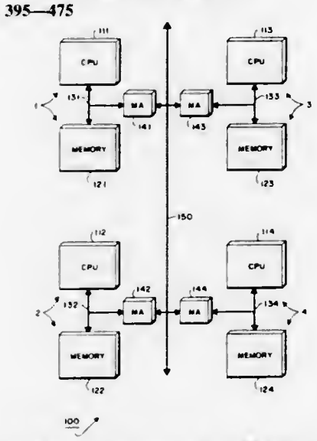
METHOD AND APPARATUS FOR SYNCHRONIZING DATA QUEUES IN ASYMMETRIC REFLECTIVE MEMORIES

Wayne M. Cardoza, Amherst, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 20, 1994, Ser. No. 326,682

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—475 **7 Claims**



4. An apparatus for synchronizing modification of a common data structure shared by a plurality of processors, comprising:

an asymmetric reflective memory having a global write-only address space shared by the plurality of processors and a local read/write address space for each of the plurality of processors;

a queue element stored in the global write-only address space of the asymmetric reflective memory by a first processor, the asymmetric reflective memory to copy the queue element to the local read/write address space of a second processor the queue element storing common data to be shared by the plurality of processors;

a queue header stored in the global write-only address space of the asymmetric reflective memory by the first processor, the asymmetric reflective memory to copy the queue header to the local read/write address space of the second processor;

in response to detecting the queue element, means for reading the queue header and writing a zero in the queue header, the means for reading and writing the queue header performing the reading and writing steps atomically in the local read/write address space of the second processor;

means for processing the common data stored in the queue element; and

means for marking the queue element as processed in the global address space.

5,588,133

REGISTER BLOCK CIRCUIT FOR CENTRAL PROCESSING UNIT OF MICROCOMPUTER

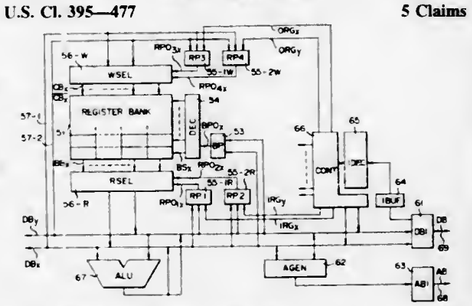
Kazuyoshi Yoshida, Tokyo; Hiroshi Itoh; Hiroshi Fukuoka, both of Yokohama, and Makoto Shinohara, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 52,287, Apr. 26, 1993, Pat. No. 5,450,566, which is a continuation of Ser. No. 461,004, Jan. 4, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 460,780

Claims priority, application Japan, Jan. 13, 1989, 1-7432

Int. Cl.[6] G06F *12/06*

U.S. Cl. 395—477 **5 Claims**



1. A register block circuit comprising:

a register array having a matrix structure made up of rows and columns, said rows having a plurality of banks, said banks having a plurality of registers corresponding to respective of the columns, and wherein the registers store data;

a plurality of data buses;

first selecting means for selecting one bank from among the banks of the register array;

second selecting means for selecting a plurality of registers from the bank selected by said first selecting means, and for connecting the selected registers to the data buses;

said second selecting means including:

first register number storing means for storing a plurality of register numbers which are used for reading out data,

second register number storing means for storing at least one register number which is used for writing data,

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first register selecting means for selecting a plurality of registers used for reading out data from the bank selected by the first selecting means, on the basis of register numbers supplied from the first register number storing means, and for connecting the registers to the data buses, and

second register selecting means for selecting at least one register used for writing data in the bank selected by the second register number storing means, on the basis of a register number or numbers supplied from the second register number storing means, and for connecting said at least one register to the data buses.

5,588,134

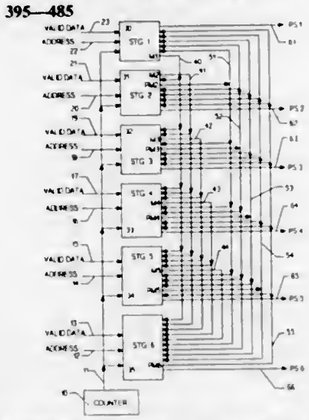
SYSTEM FOR ESTABLISHING PRIORITY AMONG SELECTED TASKS BASED ON LOCATION OF TASKS AND SEQUENCE THAT THE TASKS WERE STORED WHEREAS TASK IS ALWAYS STORED IN LOCATION WITH THE LOWEST AVAILABLE ADDRESS

John C. Onetó, Campbell, and Stephen P. Russell, Morgan Hill, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Sep. 25, 1992, Ser. No. 951,387

Int. Cl.[6] G06F *7/00;7/04;13/34*

U.S. Cl. 395—485 **20 Claims**



1. In a system having a plurality of sources for generating tasks and a plurality of receivers for receiving said tasks wherein a plurality of said tasks for one or more said receivers may be generated at the same time by one or more of said sources, each said receiver having a unique address within said system, an apparatus comprising:

storage means for storing said tasks generated by said sources into addressed locations within said storage means where a task when received by said storage means is always stored in a location which has the lowest address in said storage means and which is available to accept a task;

address means for generating, in each system cycle, the address of one of said receivers; and

priority means connected to said address means and said storage means for establishing priority among selected tasks, said selected tasks being those tasks for receiver whose address is being generated by said address means, and for generating a signal indicating which task of said selected tasks has priority, where said priority is established as a function of said selected tasks' location in said storage means and the sequence that said selected tasks were stored in said storage means.

5,588,135

DATA PROCESSING DEVICE IN A VIRTUAL MEMORY HAVING A PAGING FUNCTION

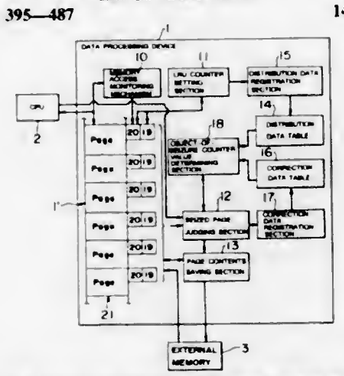
Takehiko Tanaka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 7, 1993, Ser. No. 133,220

Claims priority, application Japan, Oct. 7, 1992, 4-268325

Int. Cl.[6] G06F *12/06*

U.S. Cl. 395—487 **14 Claims**



1. A data processing device having a paging function in which a main memory is divided into a plurality of page frames, a program is divided into pages of which size is the same as a page frame, page-out is performed when a required page is not written in the main memory, and, thereafter, page-in is performed to write a required page from an external memory into the main memory, comprising:

measuring means for measuring for every page stored in the main memory time elapsed since the page was last referred to;

grouping means for grouping the pages into page groups in which each page has the same elapsed time;

counting means for counting a number of pages in each group of pages;

adding means for adding the counted numbers for each of the groups, in order of decreasing the elapsed time for the group from longer elapsed time to shorter elapsed time, when a page fault occurs and some pages are requested to be paged-out;

referenced elapsed time determining means for determining a elapsed time for a group, adding of the counted number for which causes a result of the adding to exceed a number of requested pages to be paged-out, as a reference elapsed time for pages to be paged out; and

means for comparing the elapsed time of each page with the reference elapsed time and for determining the pages in which the elapsed time is greater than the reference elapsed time.

5,588,136

MEMORY CONTROL METHOD AND APPARATUS THEREFOR

Kimio Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 26, 1994, Ser. No. 279,857

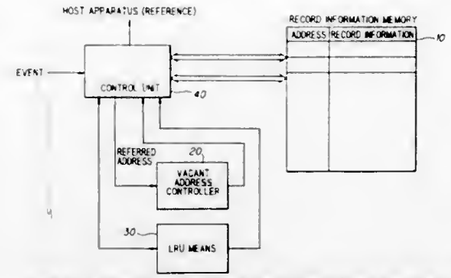
Claims priority, application Japan, Jan. 11, 1994, 6-001209

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—187 **4 Claims**

1. A memory controlling apparatus for serially storing the record information on an event into a memory of a predetermined size, storing the record information on a new event at the address at which the oldest record information is stored when said memory becomes full, and storing the record information on a new event at an apparently vacant address where the record information which has proved to be unnecessary as a result of reference is stored, said memory controlling apparatus comprising:

a vacant address controller for storing the address data for specifying the vacant addresses where the record information



which is referred to has been stored, supplying the address data in the order of storage, and designating the addresses for storing the record information on new events by the supplied address data;

an LRU means for serially storing an address data which specifies the address of said memory at which record information is stored, said address data being input every time said record information is stored there and, if the same address data as that stored in said LRU means is input, eliminating the latter and storing the input address data as the latest address data;

a control unit for obtaining the address at which the oldest record information is stored from said LRU means, if no address is designated by said vacant address controller when a new event occurs, and storing the record information on said new event at said address obtained, while storing said record information on said new event at the designated address when said address is designated by said vacant address controller.

a means for monitoring the number of pieces of record information as an object of retrieval which inputs the address data for specifying n number of addresses where said record information referred to is stored to said vacant address controller and said LRU means in the order of reference, holds the latest n as the number of pieces of record information as an object of next retrieval and adds 1 to the number n of the pieces of record information as the objects of retrieval every time a new event occurs after new n events have occurred; and

a retrieving means for obtaining the addresses of the latest n pieces of record information in said memory from said LRU means, and retrieving the record information which satisfies a predetermined condition from said latest n pieces of record information.

5,588,137

DATA FLOW CONTROL APPARATUS AND MEMORY APPARATUS

Masato Yoneda, and Yoshiaki Shibata, both of Tokyo, Japan, assignors to Kawasaki Steel Corporation, Hyogo-ken, Japan

Filed May 31, 1994, Ser. No. 251,290

Claims priority, application Japan, Jun. 2, 1993, 5-131944; Jun. 10, 1993, 5-138635; Jun. 10, 1993, 5-138756; Jul. 19, 1993, 5-178044

Int. Cl.[6] G06F *12/14;* **H04K** *1/00;* **H04L** *9/00*

U.S. Cl. 395—490 **33 Claims**

1. A data flow control apparatus comprising:

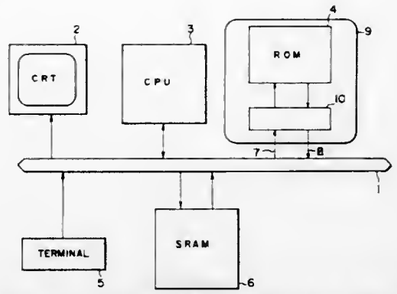
a first input terminal for sequentially receiving a first input data;

a second input terminal for sequentially receiving a second input data;

an output terminal through which output data are sequentially outputted;

memory means for storing one or more replacement data which are defined for associated one or more arrays, respectively, each including a plurality of said first input data; and

data switching means for outputting through said output terminal, as said output data, mutually different data which are selected from among a data group in accordance with whether or not a plurality of said first input data, which include an up-to-date first input data entered through said first input terminal and go back from the up-to-date first input data to



their inputted order, correspond to any one of said arrays, where said data group consists of a first output data wherein at least a part of bits or the whole bits of said second input data entered from said second input terminal are replaced by said replacement data defined corresponding to said array, a second output data having the same logic as said second input data entered through said second input terminal, a third output data produced through a logical operation based on said first output data, and a fourth output data produced through a logical operation based on both said first output data and said second output data.

5,588,138

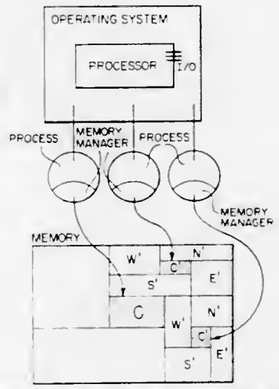
DYNAMIC PARTITIONING OF MEMORY INTO CENTRAL AND PERIPHERAL SUBREGIONS

Baocheng Bai, Havertown; Mahmut Guner, Landenberg; Duojia Lu, Norristown; David A. Rosenblitt, Unionville, and Kaaren L. Stuck, West Chester, all of Pa., assignors to Gestalt Technologies, Incorporated, Landenberg, Pa.

Continuation of Ser. No. 141,778, Oct. 22, 1993, abandoned. This application Feb. 8, 1996, Ser. No. 598,401

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—497.04 **27 Claims**



1. A distributed memory system for a computer system having means for concurrently executing a plurality of processes comprising:

(a) a memory;

(b) means for dynamically partitioning the memory into variable-size regions, each region including a central subregion and at least four sibling peripheral subregions, and means for further subdividing each peripheral subregion into a center subregion and at least four sibling subregions;

(c) means for allocating each central subregion to a specific concurrently executing process; and

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(d) means within each region for dynamically controlling memory use within that region and for directly addressing memory locations without requiring any relocation of data.

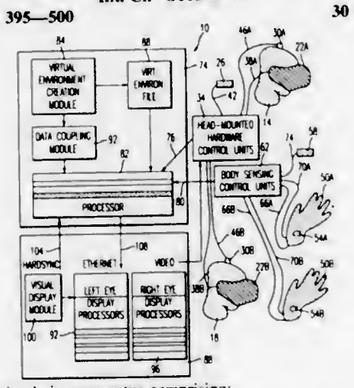
5,588,139

METHOD AND SYSTEM FOR GENERATING OBJECTS FOR A MULTI-PERSON VIRTUAL WORLD USING DATA FLOW NETWORKS

Jaron Z. Lanier, Palo Alto; Jean-Jacques G. Grimaud, Portola Valley; Young L. Harvill; Ann Lasko-Harvill, both of San Mateo; Chuck L. Blanchard, Palo Alto; Mark L. Oberman, Mountain View, and Michael A. Teitel, La Honda, all of Calif., assignors to VPL Research, Inc., Redwood City, Calif.

Continuation of Ser. No. 535,253, Jun. 7, 1990, abandoned.
This application Oct. 8, 1993, Ser. No. 133,802
Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **30 Claims**



1. A simulating apparatus comprising:

modeling means for creating a model of a physical environment in a computer database;

first body sensing means, disposed in close proximity to a part of a first body, for sensing a physical status of the first body part relative to a first reference position;

second body sensing means, disposed in close proximity to a part of a second body, for sensing a physical status of the second body part relative to a second reference position;

first body emulating means, coupled to the first body sensing means, for creating a first cursor in the computer database, the first cursor including plural first cursor nodes and emulating the physical status of the first body part, the first body emulating means including a first point hierarchy and a first data flow network, the first point hierarchy for controlling a shape and an orientation of the first cursor and for attaching each of the plural first cursor nodes hierarchically with at least one other of the plural first cursor nodes, the first data flow network for controlling motion of the first cursor and the first data flow network including a first interconnection of first input units, first function units and first output units, the first input unity receiving the physical status of the first body part, each first function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of the at least one output, and the first output units for producing position and orientation values for a portion of the plural first cursor nodes;

first integrating means, coupled to the modeling means and to the first emulating means, for integrating the first cursor with the model;

second body emulating means, coupled to the second body sensing means, for creating a second cursor in the computer database, the second cursor including plural second cursor nodes and emulating the physical status of the second body part, the second body emulating means including a second point hierarchy and a second data flow network, the second point hierarchy for controlling a shape and an orientation of the second cursor and for attaching each of the plural second cursor nodes hierarchically with at least one other of the plural second cursor nodes, the second data flow network for controlling motion of the second cursor and the second data flow network including a second interconnection of second input units, second function units and second output units, the second input units receiving the physical status of the second body part, each second function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of the at least one output, and the second output units for producing position and orientation values for a portion of the plural second cursor nodes; and

second integration means, coupled to the modeling means and to the second body emulating means, for integrating the second cursor with the model.

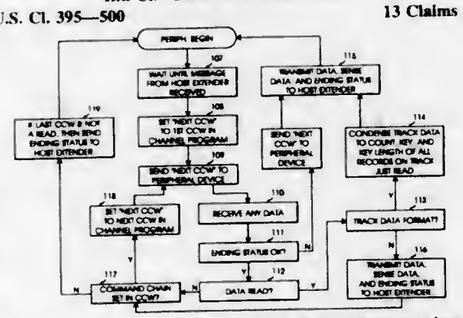
5,588,140

TRANSPARENT EXTENSION OF PERIPHERAL FROM HOST

Eugene D. Misukanis, Little Canada; John H. Long, Richfield; Lawrence A. Dean, Vadnais Heights, and Douglas J. Kuligowski, Brooklyn Park, all of Minn., assignors to Computer Network Technology Corporation, Minneapolis, Minn.

Filed Mar. 15, 1993, Ser. No. 31,543
Int. Cl.[6] G06F *9/455;13/00;15/00*

U.S. Cl. 395—500 **13 Claims**



1. A method of extending the operating distance between a host computer and a peripheral device, comprising the steps of:

(a) providing a host extender for communicating directly with the host computer;

(b) providing a peripheral extender for communicating directly with the peripheral device and connecting the host extender and the peripheral extender;

(c) obtaining data storage characteristics of the peripheral device in order for the host extender to emulate the peripheral device, comprising the steps of:

(1) generating a channel program in the host extender to read the data storage characteristics of the peripheral device;

(2) transmitting the channel program to the peripheral extender;

(3) the peripheral extender querying the peripheral device in accordance with the channel program;

(4) the peripheral extender receiving the data storage characteristics from the peripheral device;

(5) the peripheral extender transmitting the data storage characteristics to the host extender; and

(6) the host extender storing the data storage characteristics in a host extender cache;

(d) the host extender receiving one or more channel commands from the host computer; and

(e) the host extender responding to the host computer as if it were the peripheral device, based at least in part on the data storage characteristics of the peripheral device stored in the extender cache.

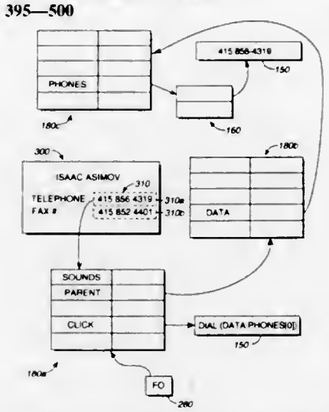
5,588,141

SYSTEM FOR EXECUTING DIFFERENT FUNCTIONS ASSOCIATED WITH DIFFERENT CONTEXTS CORRESPONDING TO DIFFERENT SCREEN EVENTS BASED UPON INFORMATION STORED IN UNIFIED DATA STRUCTURE

Walter R. Smith, Palo Alto, and Stephen P. Capps, San Carlos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 30, 1993, Ser. No. 99,852
Int. Cl.[6] G06F *9/06*

U.S. Cl. 395—500 **27 Claims**



1. A computer-implemented method for accomplishing unified data structure operations in connection with a computer including a unified data structure, a computer interface system, and a computer execution system, said method including the steps of:

(a) activating a selected screen on a computer display by effecting a screen event with a predetermined context, said selected screen being implemented by said computer interface system wherein a plurality of predetermined contexts are available with said computer display, and each one of said plurality of predetermined contexts is associated with a different one of a plurality of screen events,

(b) sending a message with respect to the predetermined context of the indicated screen event to a first unified data structure element of said unified data structure, said first unified data structure element being associated with said predetermined context, and said unified data structure being common to, and able to be shared by, the computer interface system and the computer execution system,

(c) responding to the message according to the predetermined context of the associated screen event, including execution by the computer execution system utilizing said unified data structure of at least a single function object associated with the predetermined context of the message, wherein different function objects are associated with different ones of said plurality of predetermined contexts, and

(d) referring to at least a second unified data structure element of said unified data structure pointed to by the first unified data structure element according to the predetermined context of the message, the referring under control of the computer execution system.

5,588,142

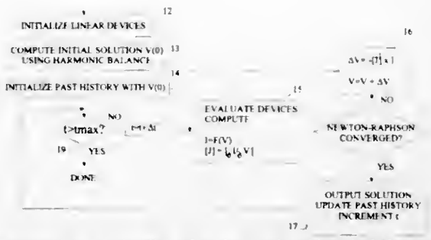
METHOD FOR SIMULATING A CIRCUIT

David Sharrit, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 12, 1995, Ser. No. 440,204
Int. Cl.[6] G06F *9/455;17/50*

U.S. Cl. 395—500 **5 Claims**

1. In a method for simulating the response of a circuit to a stimulating signal using a digital computer, said circuit being



represented by a plurality of nodes, each said node being connected to one or more devices, each said device corresponding to a computer routine that provides the current sourced by the corresponding device when said nodes are held at a set of potentials provided to said routine, the improvement comprising the step of approximating said stimulating signal, v(t), by

$$v(t) = Real\left(\sum_{k=0}^{K} V_k(t)e^{j\omega_k t}\right)$$

where $V_k(t)$ is a time varying voltage, and $K \geqq 0$.

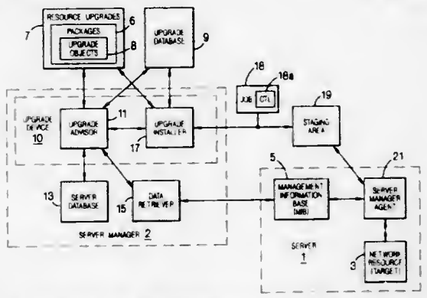
5,588,143

AUTOMATIC COMPUTER UPGRADING

Richard A. Stupek, Jr., Houston; David S. Shaffer; Curtis R. Jones, both of Cypress; Steve Davis, and William D. Justice, Jr., both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 303,173, Sep. 8, 1994. This application May 23, 1995, Ser. No. 447,980
Int. Cl.[6] G06F *7/02*

U.S. Cl. 395—500 **4 Claims**



1. A method for use in changing a resource of a computer from a first version of the resource to a second version of the resource, comprising:

digitally storing, on a portable medium, the second version of the resource and replacement information which

identifies the second version,

describes features of the second version relative to at least one earlier version of the resource,

identifies the location of the second version of the resource on the portable medium,

provides instructions for installation of the second version of the resource,

describes at least one reason for the second version,

indicates a type of change from other versions to the second version, and

indicates the importance of the change from the other versions to the second version,

digitally storing in the computer information identifying the first version,

by computer, automatically determining which of the other versions is the first version,

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based on the results of the determining step,

automatically determining whether to change the resource, and

automatically changing the resource.

5,588,144

STORAGE SYSTEM HAVING A BUS COMMON TO A PLURALITY OF KINDS OF GROUPS OF PACKAGES

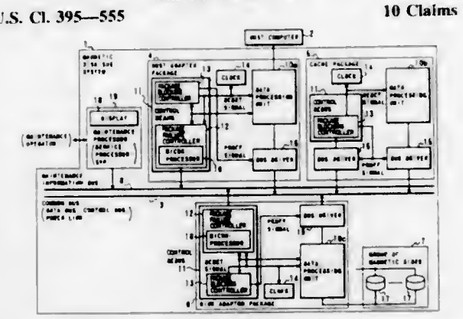
Mitsuru Inoue, Odawara, and Hiroyuki Kurosawa, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 346,440

Claims priority, application Japan, Dec. 3, 1993, 5-303775

Int. Cl.[6] G06F *1/14*

U.S. Cl. 395—555 **10 Claims**



1. A storage system for connection to a host computer, the system having a common bus and comprising:

a plurality of host interface logic devices to be connected to the host computer and constituting an interface to the host computer; and

a storage device for storing data;

a plurality of storage device interface logic devices connected to the storage device each constituting an interface to said storage device; and

a plurality of cache memory devices each for temporarily storing data transmitted between said host interface logic devices and said storage interface logic devices;

wherein each of said plurality of host interface logic devices, said plurality of storage device interface logic devices, and said cache memory devices constitutes a package which is connected to said common bus respectively, the common bus connecting these devices to each other, and each said package has an independently operable clock circuit for supplying a clock to the circuit therein and a control means for executing a blocking processing by stopping the supply of said clock to said circuit therein, and each package is detachably mounted to the common bus.

5,588,145

METHOD AND ARRANGEMENT FOR CLOCK ADJUSTMENT USING PROGRAMMABLE PERIOD BINARY RATE MULTIPLIER

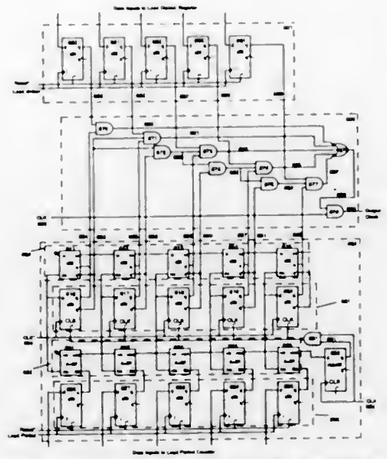
John A. Wishneusky, Bolton, Mass., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Mar. 31, 1995, Ser. No. 415,021

Int. Cl.[6] G06F *1/08*

U.S. Cl. 395—555 **51 Claims**

1. An apparatus for scaling a first clock frequency output by a computer device clock to generate a second clock frequency, comprising:



counter means responsive to said clock for counting pulses of said first clock frequency;

first comparator means responsive to said counter means and a period count value for generating a periodic clock frequency; and

second comparator means responsive to said periodic clock frequency and a divisor count value for scaling said periodic clock frequency to generate said second clock frequency.

5,588,146

METHOD FOR THE ACQUISITION OF SOFTWARE AND DATA-PROCESSING SYSTEM TO IMPLEMENT THE METHOD

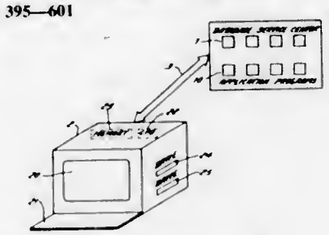
Jean-Yves Leroux, Bouc Bel Air, France, assignor to Gemplus Card International, Gemenos, France

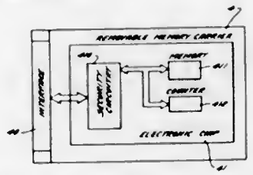
Filed Oct. 21, 1993, Ser. No. 140,661

Claims priority, application France, Oct. 23, 1992, 92 12702

Int. Cl.[6] G06F *17/30;12/14;15/163*

U.S. Cl. 395—601 **20 Claims**





1. A method for the acquisition of software programs from a database service center by a computer, the method comprising the steps of:

loading a plurality of software programs into the data base service center;

providing a user of a microcomputer with a first removable electronic memory carrier containing a right of access to a specific subset of the plurality of software programs of the database service center, the first memory carrier having insufficient capacity to store the specific subset of the plurality of software programs;

providing the user of the microcomputer with a right of use proper to the specific subset of the plurality of software programs, the right of use being provided on a second removable electronic memory carrier;

introducing the first memory carrier into a first memory carrier drive of the microcomputer;

remote-loading the specific subset of the plurality of software programs from the service center into the microcomputer, the remote-loading being authorized based on the right of access contained in the first memory carrier provided to the user;

introducing the second memory carrier into a second memory carrier drive of the microcomputer;

executing the specific subset of the plurality of software programs, the executing step being performed by the microcomputer; and

interrogating the memory carrier to check the right of use, and permitting or prohibiting continued execution of the specific subset of the plurality of software programs based on the interrogating step.

5,588,147

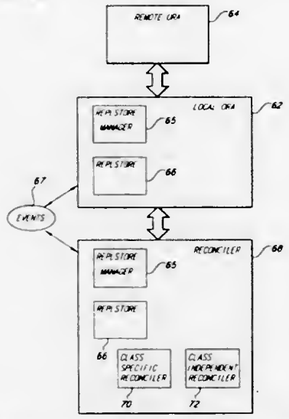
REPLICATION FACILITY

Yuval Neeman, Bellevue; Peter Cook, Redmond; Arnold S. Miller, Bellevue, and Balan Raman, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jan. 14, 1994, Ser. No. 181,704

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—601 **29 Claims**



1. In a distributed system having a replication facility and a number of computer systems that each include a storage device, a method comprising the steps of:

providing a plurality of files organized into a tree of files;

replicating a single one of the files that is stored in the storage device of one of the computer systems using the replication facility so that a copy of the file is stored in the storage device of another of the computer systems; and

replicating a subtree of files of multiple levels, from the tree of files, that is stored in the storage device of one of the computer systems using the replication facility so that a copy of the subtree of files is stored in the storage device of another of the computer systems.

5,588,148

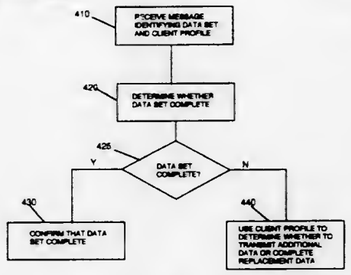
METHOD FOR MANAGING DATA TRANSFER BETWEEN COMPUTING DEVICES

Michael R. Landis; Anthony J. Yeates, both of Cary, and Thomas J. Gavin, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 6, 1994, Ser. No. 301,374

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—601 **13 Claims**



1. A method, comprising the steps of:

receiving a message identifying a particular data set and a client profile;

determining whether the particular data set represents a complete data set;

confirming that the particular data set represents the complete data set, when the particular data set does represent the complete data set; and

using the client profile to determine whether to transmit additional data to complete the particular data set, or the complete data set to replace the particular data set, when the particular data set does not represent the complete data set.

5,588,149

DOCUMENT CLASSIFICATION AND RETRIEVAL WITH TITLE-BASED ON-THE-FLY CLASS MERGE

Kenji Hirose, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1994, Ser. No. 306,947

Claims priority, application Japan, Sep. 21, 1993, 5-234979

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—601 **2 Claims**

1. A data processing system, comprising:

first recording means for recording a plurality of data;

second recording means for recording retrieval titles including a plurality of retrieving keys used for retrieving data recorded in the first recording means;

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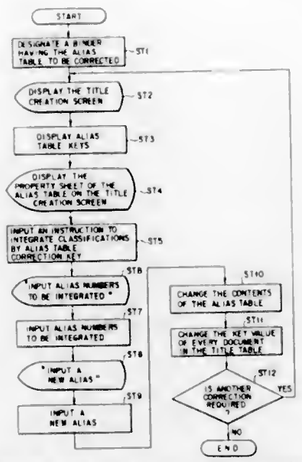


third recording means for recording a correspondence table in which a plurality of different symbols respectively correspond to a plurality of series of letters respectively used as retrieving keys;

retrieval title producing means for producing the retrieval titles to be recorded in the second recording means by designating a symbol in the correspondence table recorded in the third recording means, and recording the designated symbol as a retrieving key;

first designating means for designating a plurality of series of letters recorded in the correspondence table in the third recording means in order to integrate the designated series of letters into one series of letters;

second designating means for designating a new series of letters for the plurality of series of letters designated by the first designating means;

third designating means for designating a symbol corresponding to the new series of letters designated by the second designating means;

first processing means for deleting the plurality of series of letters designated by the first designating means from the correspondence table in the third recording means and for recording in the correspondence table the new series of letters in correspondence with the symbol designated by the third designating means; and

second processing means for extracting a symbol corresponding to the series of letters to be integrated, designated by the first designating means, from the retrieval titles recorded in the second recording means, and changing the extracted symbol to the symbol designated by the third designating means.

5,588,150

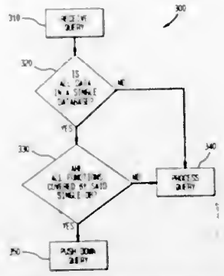
PUSH DOWN OPTIMIZATION IN A DISTRIBUTED, MULTI-DATABASE SYSTEM

Eileen T. Lin, San Jose, and Yun Wang, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1994, Ser. No. 310,797
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—601 **7 Claims**

1. In a heterogeneous, distributed database system having a plurality of database instances, a computer-based method of optimizing performance of the database system by determining whether a query can be pushed down to a single database instance, comprising the steps of:

(1) evaluating the query for data coverage by determining whether all data referenced in the query is located within a single database instance;



(2) evaluating the query for capability coverage by determining whether all capabilities referenced in the query can be performed by said single database instance; and

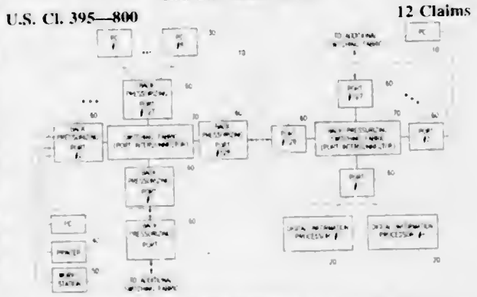
(3) pushing down the query to the single database instance if said data coverage and said capability coverage are satisfied.

5,588,151

APPARATUS AND METHOD FOR COMMUNICATION SWITCHING INCLUDING PROVIDING INFORMATION OVERFLOW INDICATIONS

Jacob Segal, Ra'Anana; Josef Ben-Moshe, Holon; Zvika Weinstock, Petach Tikva, and Zvika Harnik, Rishon Lezion, all of Israel, assignors to Lannet Data Communications Ltd., Tel Aviv, Israel

Continuation of Ser. No. 217,328, Mar. 24, 1994, abandoned.
This application Sep. 8, 1995, Ser. No. 525,500
Claims priority, application Israel, Jan. 31, 1994, 108505
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—800 **12 Claims**



1. Communication switching apparatus for providing LAN communication among a multiplicity of digital information processors, each said processor conventionally including an activity detector operative to cause the processor to refrain from transmitting information onto a medium when the activity detector encounters a symptom of activity on said medium,

the switching apparatus including:

a plurality of ports each communicating with at least one of the digital information processors via said medium;

a LAN port interconnector interconnecting at least two of said plurality of ports; and

an overflow indicator, sensing overflow at at least one of:

the LAN port interconnector; and

at least one of the plurality of ports;

the switching apparatus being characterized in that the overflow indicator, upon sensing said overflow, provides an artificially generated symptom of activity to at least one said activity detector.

5,588,152

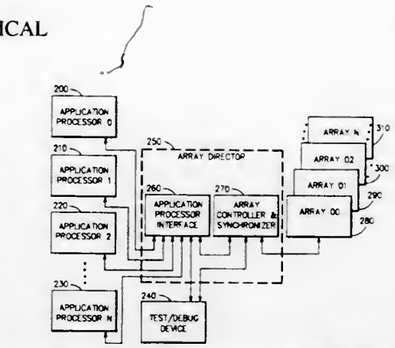
ADVANCED PARALLEL PROCESSOR INCLUDING ADVANCED SUPPORT HARDWARE

Michael C. Dapp, Endwell; Thomas N. Barker, Vestal; James W. Dieffenderfer, Owego; Billy J. Knowles, Kingston; Donald M. Lesmeister, Vestal; Richard E. Nier, Apalachin; David B. Rolfe, West Hurley, and Vincent J. Smoral, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 380,230, Jan. 30, 1995, abandoned, and Ser. No. 887,612, May 22, 1992, abandoned, and a continuation-in-part of Ser. No. 324,295, Oct. 17, 1994, Pat. No. 5,475,856, and Ser. No. 301,278, Sep. 6, 1994, which is a continuation of Ser. No. 611,594, Nov. 13, 1990, abandoned.
This application Aug. 25, 1995, Ser. No. 519,859
Int. Cl.[6] G06F *15/80*
U.S. Cl. 395—800 **16 Claims**

1. A computer system, comprising:

a plurality of processor-memory elements (PME's), each processor-memory element (PME) containing a processor, a memory, and a multi-bit parallel data path therebetween;



a plurality of nodes interconnected as a multi-dimensional network cluster, each node containing a plurality of processor-memory elements (PME's); and

a cluster controller for said plurality of nodes;

wherein each processor-memory element (PME) of a node has a plurality of communication paths to processor-memory elements (PME's) within the node and at least one communication path to a processor-memory element (PME) external to the node.

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DESIGN PATENTS

GRANTED December 24, 1996

ERRATA

For CLASS	See PATENT NO.
D12–220	D376,792
D008–354	D376,815

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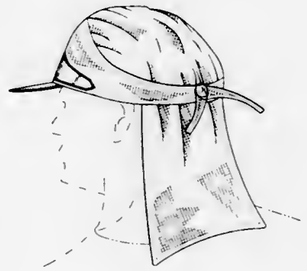
DESIGNS

DECEMBER 24, 1996

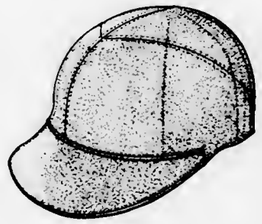
376,679
GARMENT WITH DETACHABLE BIB
John G. Edens, and LouAnn S. Edens, both of 1623 Fawnhaven Way, Lodi, Calif. 95240
Filed Mar. 3, 1995, Ser. No. 35,606
Term of patent 14 years
U.S. Cl. D2—733

376,681
HEADWRAP WITH DETACHABLE VISOR
John P. Riesenman, and Terri S. Riesenman, both of 2097 E. Washington St., #1E397, Colton, Calif. 92324
Filed Nov. 28, 1995, Ser. No. 47,148
Term of patent 14 years
U.S. Cl. D2—879



376,680
LONG PANTS
Luigi Volpati, Piazza Padella 7, I-00062 Bracciano (Roma), Italy
Filed Oct. 7, 1994, Ser. No. 29,497
Term of patent 14 years
U.S. Cl. D2—742

376,682
RIGID CAP
Claude P. Johnson, 2301 N. 50th St., Philadelphia, Pa. 19131
Filed Jun. 15, 1995, Ser. No. 40,358
Term of patent 14 years
U.S. Cl. D2—882



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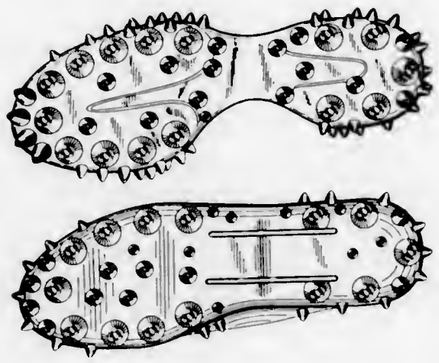
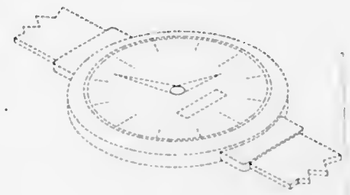
376,683
OUTSOLE FOR A ATHLETIC SHOE
Paul A. Gaudio, Lake Oswego, and Keven C. Malkewitz, Portland, both of Oreg., assignors to Adidas AG, Germany
Filed Aug. 25, 1995, Ser. No. 43,367
Term of patent 14 years
U.S. Cl. D2—954

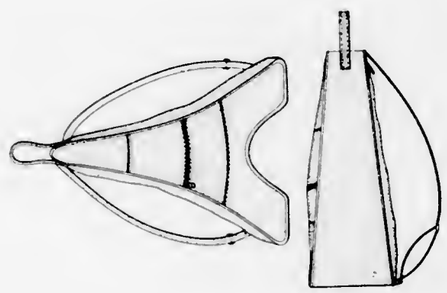


376,684
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson; Theodore A. Kastner, both of Lancaster, and Diana A. Wurfbain, Athens, all of Ohio, assignors to Rocky Shoes & Boots, Inc., Nelsonville, Ohio
Filed Mar. 2, 1995, Ser. No. 35,556
Term of patent 14 years
U.S. Cl. D2—970

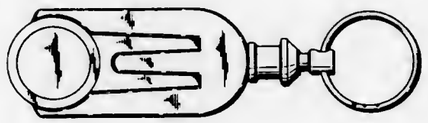
376,685
PAINTED GLASS PILL CONTAINER WITH ATTACHABLE MOUNTING PLATE
Laurence A. Weller, and Helen L. Weller, both of 2101 Santa Clara Dr., Las Vegas, Nev. 89104
Filed Apr. 15, 1996, Ser. No. 53,130
Term of patent 14 years
U.S. Cl. D3—203



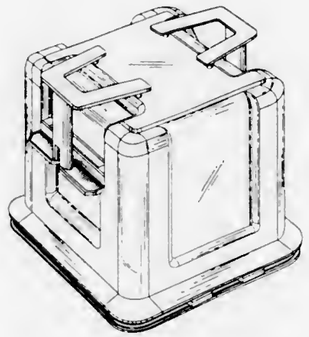
376,686
RUCKSACK
Martial Daboudet, 23, rue des Solitaires, 75019 Paris, France
Filed Jul. 12, 1995, Ser. No. 41,392
Term of patent 14 years
U.S. Cl. D3—217



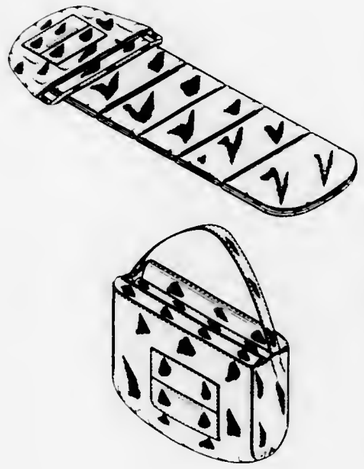
376,687
GOLF ACCESSORY
Michael R. Carretta, Tranquility, N.J., and Harry Balestrieri, Plantation, Fla., assignors to M. R. Carretta & Co., Inc., Allamuchy, N.J.
Filed Dec. 21, 1995, Ser. No. 48,174
Term of patent 14 years
U.S. Cl. D3—221



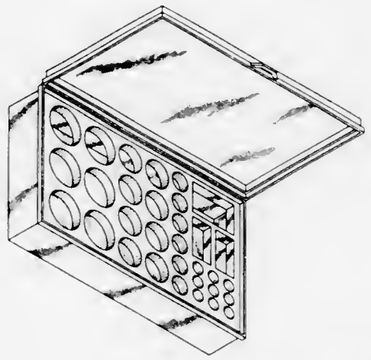
376,688
SEMICONDUCTOR WAFER CASSETTE TRANSPORT BOX
Gary M. Gallagher; Boyd C. Wittman, both of Colorado Springs, Colo., and Edmund B. Neumann, Corvallis, Oreg., assignors to Empak, Inc., Chanhassen, Minn.
Filed Dec. 20, 1994, Ser. No. 32,529
Term of patent 14 years
U.S. Cl. D3—273



376,689
COMBINATION CHAISE CUSHION AND CARRY BAG
Jerald Doppelt, 6 Linden Ave., West Orange, N.J. 07052
Filed Jan. 2, 1996, Ser. No. 48,814
Term of patent 14 years
U.S. Cl. D3—274



376,690
BATTERY STORAGE CASE HAVING A FOAM INSERT FOR RECEIVING A PLURALITY OF DIFFERENT SIZED BATTERIES
Andrew J. Lockerby, 11 Rosenfeld Rd., Millis, Mass. 02054
Filed Feb. 9, 1996, Ser. No. 50,171
Term of patent 14 years
U.S. Cl. D3—284



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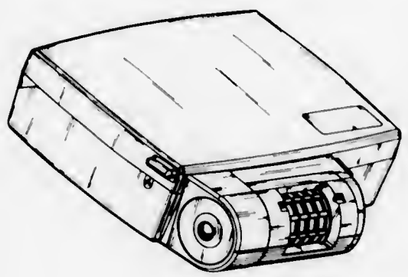
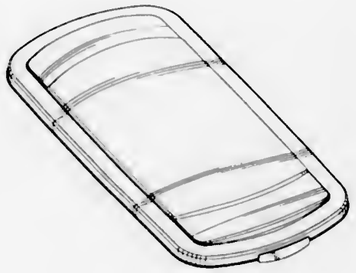
376,691
PORTABLE SECURITY CASE
Robert L. Naas, Skaneateles, and Mark A. Ferguson, Jamesville, both of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.
Filed Mar. 8, 1995, Ser. No. 35,857
Term of patent 14 years
U.S. Cl. D3—294



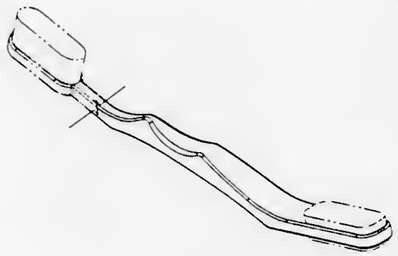
376,692
LOG CARRIER
Larry E. Hartman, 15520 98th Avenue #204, Edmonton, Alberta, Canada
Filed Jul. 12, 1995, Ser. No. 41,372
Term of patent 14 years
U.S. Cl. D3—315

376,693
STORAGE CONTAINER LID
Stacy L. Wolff, Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 5, 1995, Ser. No. 38,451
Term of patent 14 years
U.S. Cl. D3—323

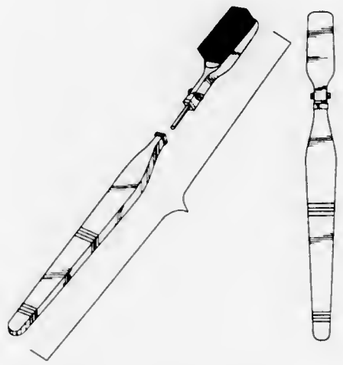


376,694
BRUSH
Sanjay Aiyar, 18671 E. Woodwind La., Anaheim, Calif. 92807
Filed Oct. 18, 1995, Ser. No. 46,633
Term of patent 14 years
U.S. Cl. D4—102

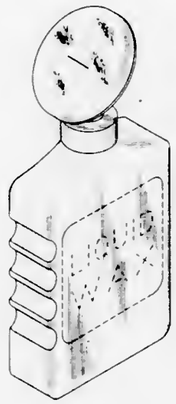
376,695
HANDLE FOR A TOOTHBRUSH AND TONGUE CLEANER
Rimvydas Tveras, 8945 W. 103rd St., Palos Hills, Ill. 60465, assignor to Rimvydas Tveras, Palos Hills, Ill.
Filed Dec. 4, 1995, Ser. No. 47,405
Term of patent 14 years
U.S. Cl. D4—104



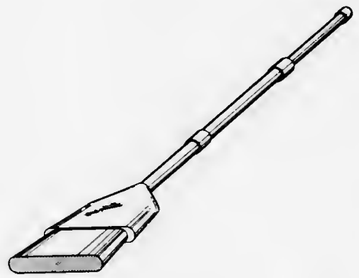
376,696
TOOTH BRUSH WITH REMOVABLE HEAD
William T. Vogel, Jr., 266 Center St., Lackawanna, N.Y. 14218
Filed Oct. 3, 1994, Ser. No. 29,317
Term of patent 14 years
U.S. Cl. D4—104



376,697
COMBINED CONTAINER AND APPLICATOR
Carl E. Green, and Alexandra R. Green, both of 322 S. Hamilton, Lincoln, Ill. 62656
Filed Apr. 24, 1995, Ser. No. 37,887
Term of patent 14 years
U.S. Cl. D4—114



376,698
BROOM
Dennis Mikuljan, 4119 Independence Ave., Mississauga, ON, Canada
Filed Dec. 19, 1995, Ser. No. 48,047
Term of patent 14 years
U.S. Cl. D4—132



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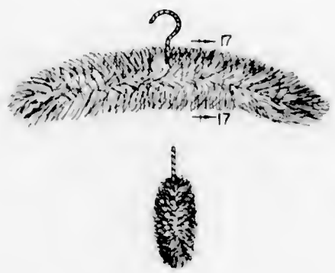
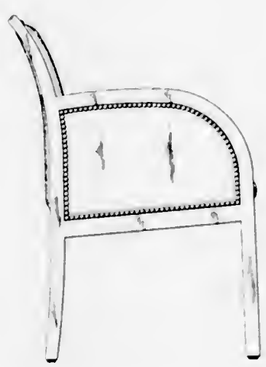
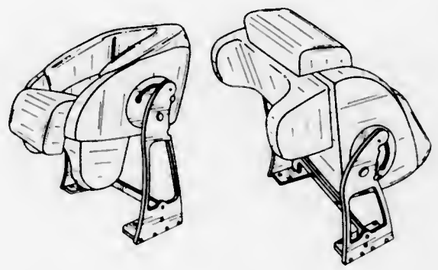
376,699
PROTECTIVE CLOTHES HANGER
Sharon A. Wood, 3355 S. Tulare Ct., Denver, Colo. 80231
Filed Jan. 23, 1995, Ser. No. 33,907
Term of patent 14 years
U.S. Cl. D6—318



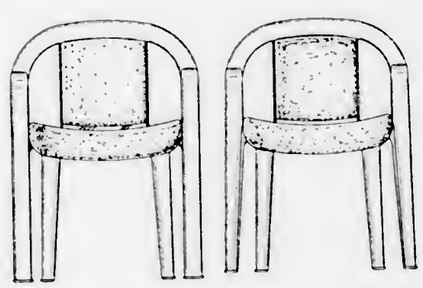
376,700
CHAIR
Frederick Brush, 53 East Ave., Norwalk, Conn. 06851
Filed Oct. 17, 1994, Ser. No. 29,793
Term of patent 14 years
U.S. Cl. D6—334



376,701
ROTATIONAL BOLSTER SEAT
Donald P. Thompson, Sarasota, Fla., assignor to Genmar Industries, Inc., Minneapolls, Minn.
Filed Dec. 1, 1995, Ser. No. 47,327
Term of patent 14 years
U.S. Cl. D6—367

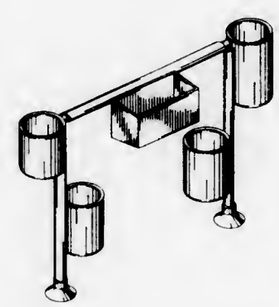


376,702
STACK CHAIR
Gary S. Cretcher, 7669 Harrisburg Hollow, Bata, N.Y. 14810
Filed Sep. 29, 1995, Ser. No. 44,752
Term of patent 14 years
U.S. Cl. D6—379

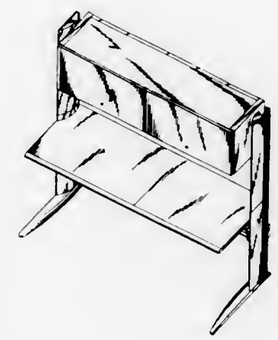


376,703
CHAIR
Chan-shin Lee, No. 303, Tzuli 1st Rd., Sanmin Dist., Kaohsiung, Taiwan
Filed Mar. 11, 1996, Ser. No. 51,449
Term of patent 14 years
U.S. Cl. D6—380

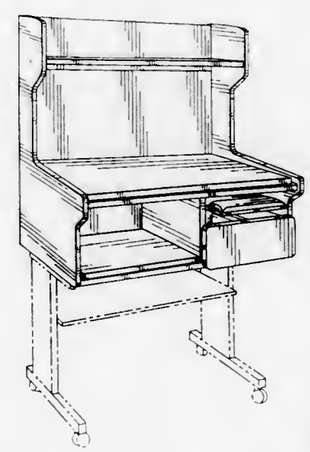
376,704
KITCHEN UTILITY RACK
Johanna Burt, 2125 Palm Vista Dr., Apopka, Fla. 32712
Filed Sep. 18, 1995, Ser. No. 44,099
Term of patent 14 years
U.S. Cl. D6—396



376,705
FREESTANDING WORKSTATION
John P. Stoddard; Roberto G. Fraquelli, both of London, England, and David F. Lyons, Grosse Pointe Farms, Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Jun. 9, 1995, Ser. No. 40,056
Term of patent 14 years
U.S. Cl. D6—426



376,706
DESK
B. Cameron Smith, Seattle, Wash., assignor to Hon Industries Inc., Muscatine, Iowa
Filed Sep. 27, 1995, Ser. No. 44,636
Term of patent 14 years
U.S. Cl. D6—426



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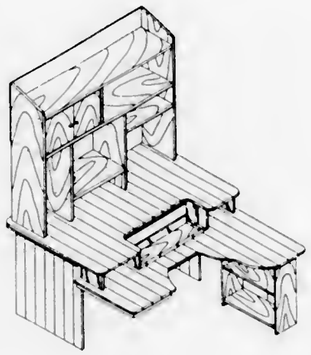
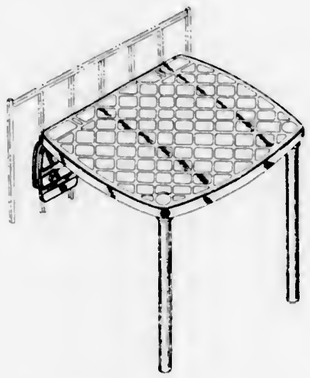
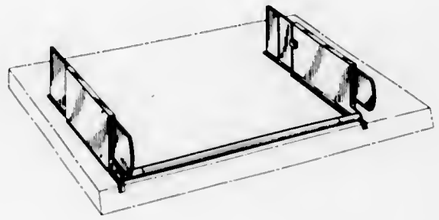
376,707
TRI-LEVEL COMPUTER CENTER
Randy G. Beason, 6445 N. Mercler St., Kansas City, Mo. 64118
Filed Dec. 18, 1995, Ser. No. 47,975
Term of patent 14 years
U.S. Cl. D6—426



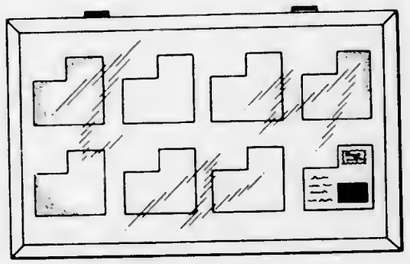
376,708
PATIO/BALCONY RAIL TABLE
Edward J. Robertson, Winchester, and Norbert Lyons, Middleton, both of Mass., assignors to Syroco, Inc., East Boston, Mass.
Filed Jul. 31, 1995, Ser. No. 42,027
Term of patent 14 years
U.S. Cl. D6—429



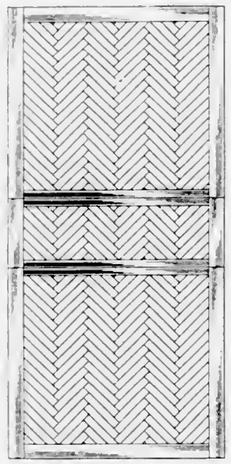
376,709
ADVERTISING DISPLAY FOR SHELVING
Richard Markson, Goshen, N.Y., assignor to Markson Rosenthal & Company, Edgewater, N.J.
Filed Jul. 19, 1995, Ser. No. 41,618
Term of patent 14 years
U.S. Cl. D6—449



376,710
DISPLAY BOX
Salim G. Kara, Houston, Tex., assignor to Post N Mail, L.C., Houston, Tex.
Filed Jun. 14, 1995, Ser. No. 40,296
Term of patent 14 years
U.S. Cl. D6—470

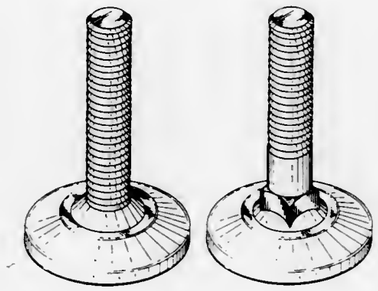


376,711
TABLE
Charles C. Harris, High Point, N.C., assignor to Victus, Ltd., Greensboro, N.C.
Filed Apr. 25, 1995, Ser. No. 39,788
Term of patent 14 years
U.S. Cl. D6—480

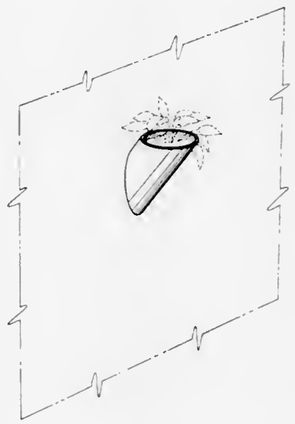


376,712
TABLE
Wolfgang C. R. Mezger, Eislingen, Germany, assignor to Wilhelm Renz GmbH & Co., Germany
Filed Mar. 24, 1995, Ser. No. 36,675
Claims priority, application Germany, Sep. 28, 1994, M 94 07 813.0
Term of patent 14 years
U.S. Cl. D6—487

376,713
ADJUSTABLE LEG
Francis F. Kelso, 1546 S. Devonshire Ave., Westlake Village, Calif. 91361
Filed Jun. 21, 1995, Ser. No. 40,526
Term of patent 14 years
U.S. Cl. D6—496



376,714
WALL MOUNTED PLANTER
Chris J. Dallimore, 5084 S. 10th East, Salt Lake City, Utah 84117
Continuation-in-part of Ser. No. 7,570, Apr. 27, 1993, Pat. No. Des. 362,405. This application Jun. 7, 1995, Ser. No. 40,452
Term of patent 14 years
U.S. Cl. D6—556



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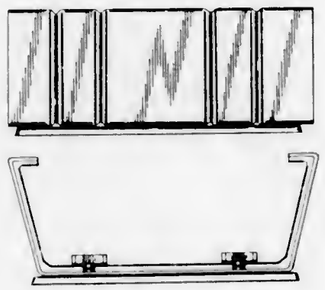
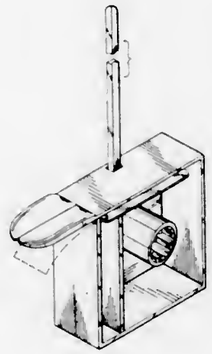
376,715
RECREATIONAL VEHICLE PEDESTAL
Jeffrey P. Few, West Hills, Calif., assignor to Norco Industries, Inc., Compton, Calif.
Filed Aug. 18, 1994, Ser. No. 27,325
Term of patent 14 years
U.S. Cl. D6—500



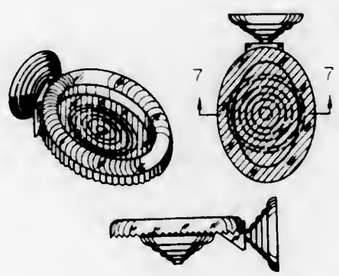
376,716
CHAIR ARMREST
Steve J. Nemeth, Jr., Park Township, Ottawa County, Mich., assignor to Haworth, Inc., Holland, Mich.
Filed Jun. 9, 1995, Ser. No. 40,055
Term of patent 14 years
U.S. Cl. D6—501

376,717
Patent Not Issued For This Number

376,718
BANDAGE DISPENSER
Kimberly A. Wilcox, 4904 Lucille Ave. SE., Salem, Oreg. 97302
Filed Oct. 18, 1995, Ser. No. 45,388
Term of patent 14 years
U.S. Cl. D6—518

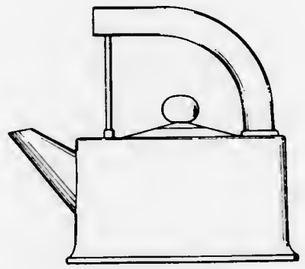


376,719
WALL-MOUNTED SOAP DISH
Beril-Volf Leykekhmakher, 2400 E. 3rd St. #203, Brooklyn, N.Y. 11223-5303, and Anna Berenbaum, 2-37 29th St., Fair Lawn, N.J. 07410
Filed Sep. 25, 1995, Ser. No. 44,499
Term of patent 14 years
U.S. Cl. D6—540

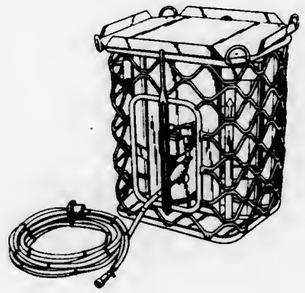


376,720
COMFORTER HAVING SEPARABLE HALVES
Wayne P. Thode, and Monique J. Thode, both of 6 Pleasant St., C-7, Hooksett, N.H. 03106
Filed Mar. 7, 1995, Ser. No. 35,829
Term of patent 14 years
U.S. Cl. D6—603

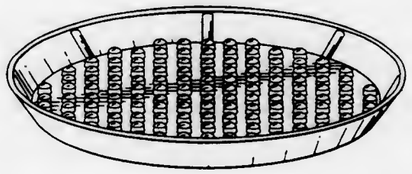
376,721
TEAPOT
Kuo-Chang Chen, Tainan Shien, Taiwan, assignor to Songson Industrial Arts Co., Ltd., Tainan Hsien, Taiwan
Filed Jan. 4, 1996, Ser. No. 44,827
Term of patent 14 years
U.S. Cl. D7—371



376,722
FIELD OVEN
Tor A. Oftedal, Oslo, and Odd Halsnes, Båstad, both of Norway, assignors to Forsvarets Forskningsinstitutt Avdeling for vapen og materiell, Kjeller, Norway
Filed Jul. 11, 1994, Ser. No. 25,755
Claims priority, application Norway, Jan. 17, 1994, D940027
Term of patent 14 years
U.S. Cl. D7—332



376,723
PIZZA SERVING DISH
David J. Asner, Moore, Okla., assignor to Aco, Inc., Oklahoma City, Okla.
Filed May 17, 1995, Ser. No. 38,975
Term of patent 14 years
U.S. Cl. D7—359



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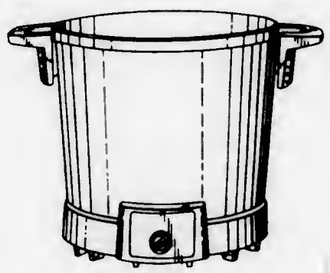
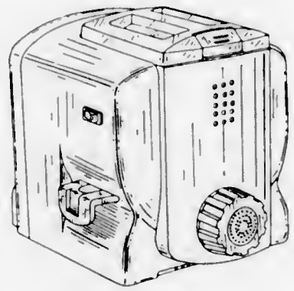
376,724
FRYER/COOKER
Lewis A. Mendelson, Overland Park, Kans., and Foster L. Taige, III, Kansas City, Mo., assignors to Dazey Corporation, New Century, Kans.
Filed May 23, 1995, Ser. No. 39,311
Term of patent 14 years
U.S. Cl. D7—360



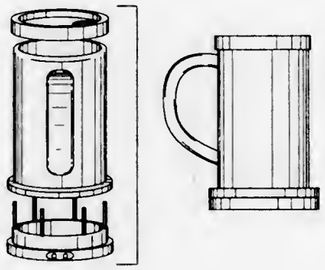
376,725
HOME PASTA MAKER
Eddy Kang, Taipei, Taiwan, assignor to Mitco International Ltd., Hsin Tien, Taiwan
Filed Jul. 8, 1994, Ser. No. 25,704
Term of patent 14 years
U.S. Cl. D7—376



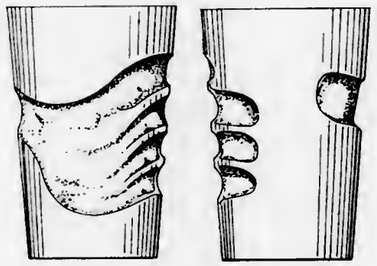
376,726
HANDLE FOR A COOKING VESSEL
Jeffrey Rohrer, Kewaskum, Wis., assignor to Regal Ware, Inc., Kewaskum, Wis.
Division of Ser. No. 35,299, Feb. 24, 1995, Pat. No. Des. 369,718. This application Sep. 15, 1995, Ser. No. 44,077
Term of patent 14 years
U.S. Cl. D7—393

376,727
HANDLE FOR UTENSIL
Gerd-Diethard Baumgarten, Wilnsdorf-Wilden, Germany, assignor to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile, Neunkirchen, Germany
Filed Aug. 3, 1995, Ser. No. 42,196
Term of patent 14 years
U.S. Cl. D7—395

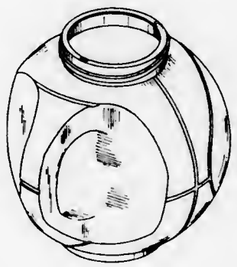
376,728
BEVERAGE CUP
Theodore N. Richards, Sr., and Emily G. Richards, both of Rear 38, W. Enterprise St., Glen Lyon, Pa. 18617
Filed Dec. 12, 1994, Ser. No. 31,987
Term of patent 14 years
U.S. Cl. D7—507



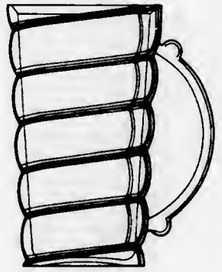
376,729
GLASS WITH INSET HAND GRIP
Mary Maki, 6641 202nd St. N., Forest Lake, Minn. 55025
Filed Dec. 8, 1995, Ser. No. 47,638
Term of patent 14 years
U.S. Cl. D7—514



376,730
DRINK CONTAINER
Dwayne S. Hurst, Tampa, and Charles B. Williams, Odessa, both of Fla., assignors to Palomino Sports, Inc., Odessa, Fla.
Filed Feb. 9, 1994, Ser. No. 18,535
The portion of the term of this patent subsequent to Aug. 20, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—515



376,731
MUG
Rick Lin, Tainan, Taiwan, assignor to Juei Chywan Enterprise Co., Ltd., Tainan, Taiwan
Filed Jun. 12, 1995, Ser. No. 40,160
The portion of the term of this patent subsequent to Apr. 30, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—536



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376,732

PLATE WITH CENTER HOT DOG COMPARTMENT

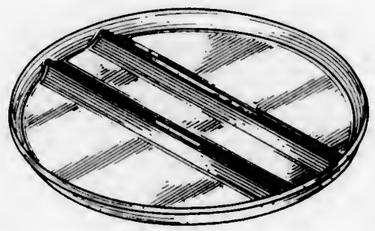
Bette E. Smith, 23681 Posey La., West Hills, Calif. 91304

Filed May 1, 1995, Ser. No. 38,223

The portion of the term of this patent subsequent to Sep. 10, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—555



376,733

DRINK HOLDER

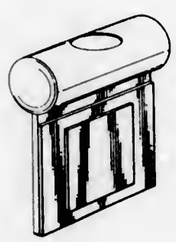
Don Bellisario, 161 North Rivermede Rd. Unit #5, Toronto, Ontario, Canada

Filed Dec. 26, 1995, Ser. No. 48,327

Claims priority, application Canada, Nov. 4, 1995, 1995-2464

Term of patent 14 years

U.S. Cl. D7—619



376,734

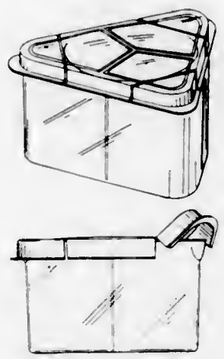
BABY FORMULA CASE

Aidan J. Petrie, Providence, R.I., assignor to The First Years Inc., Avon, Mass.

Continuation of Ser. No. 31,020, Nov. 15, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 44,818

Term of patent 14 years

U.S. Cl. D7—629



376,735

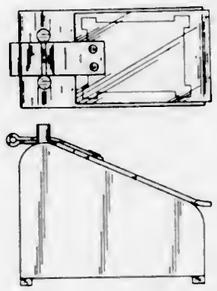
NAPKIN HOLDER WITH A MOVABLE PROTECTION CAP

Fiorentino DeSimone, Largo Olgiata 15 - Isola 2E, 00123 Rome, Italy

Filed Jun. 1, 1995, Ser. No. 39,675

Term of patent 14 years

U.S. Cl. D7—631



376,736

JUICE EXTRACTOR

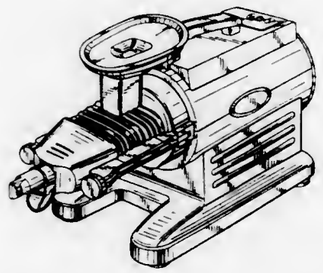
Jong-Gill Kim, 301, Hyundai Villa, 2/1, 810-14, Banghae-dong, Seocho-ku, Seoul, Rep. of Korea

Filed Oct. 25, 1995, Ser. No. 45,653

Claims priority, application Rep. of Korea, May 15, 1995, 8986/1995

Term of patent 14 years

U.S. Cl. D7—665



376,737

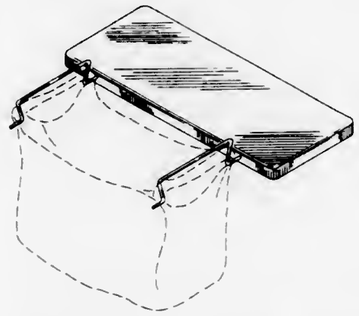
CUTTING BOARD WITH PLASTIC BAG HOLDER

Raymond G. Hecker, 300 Twin Dr., Caseyville, Ill. 62232

Filed Jun. 5, 1995, Ser. No. 39,723

Term of patent 14 years

U.S. Cl. D7—698



376,738

LUNCH BOX

Paul S. Wang, 22428 Steeple Chase La., Diamond Bar, Calif. 91765

Filed Nov. 22, 1995, Ser. No. 47,106

Term of patent 14 years

U.S. Cl. D7—709

376,739

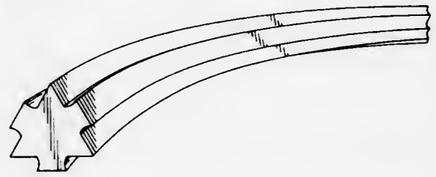
CUTTING LINE FOR A ROTATING LINE TRIMMER

David B. Skinner, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed Sep. 12, 1995, Ser. No. 43,774

Term of patent 14 years

U.S. Cl. D8—8



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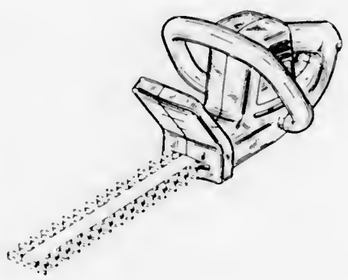
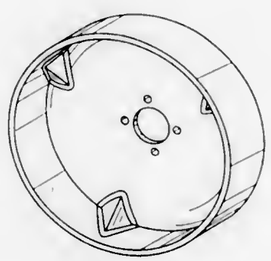
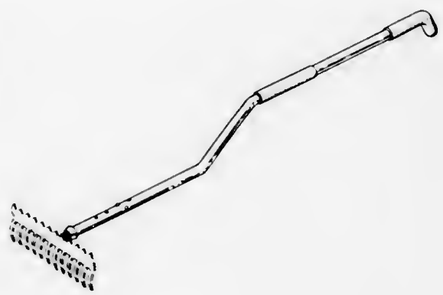
376,740
HEDGE TRIMMER
Paul Gildersleeve, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jul. 28, 1995, Ser. No. 41,993
Term of patent 14 years
U.S. Cl. D8—8



376,741
MULCHING ATTACHMENT FOR A LAWN MOWER
Gerald R. Sadlowski, Sr., 4515 Groveland St., Bradenton, Fla. 34207
Filed Sep. 25, 1995, Ser. No. 44,449
Term of patent 14 years
U.S. Cl. D8—8

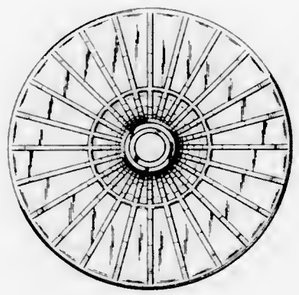


376,742
TOOL HANDLE
Christine E. Filowiak, West Fairview, and Barry R. Albert, Camp Hill, both of Pa., assignors to True Temper Hardware Company, Camp Hill, Pa.
Filed Jul. 27, 1995, Ser. No. 41,946
Term of patent 14 years
U.S. Cl. D8—13

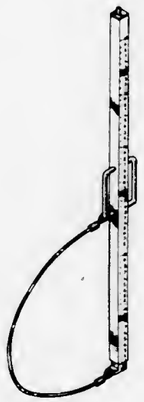


376,743
COMBINED FOLDING KNIFE HANDLE AND BLADE SEGMENTS
Brett P. Seber, Escondido, and Roy L. Helton, Jr., San Diego, both of Calif., assignors to Buck Knives, Inc., El Cajon, Calif.
Continuation-in-part of Ser. No. 138,703, Oct. 18, 1993, abandoned, Ser. No. 138,670, Oct. 18, 1993, abandoned, Ser. No. 26,042, Jul. 18, 1994, Pat. No. Des. 369,287, and Ser. No. 26,044, Jul. 18, 1994. This application Sep. 16, 1994, Ser. No. 28,510
Term of patent 14 years
U.S. Cl. D8—99

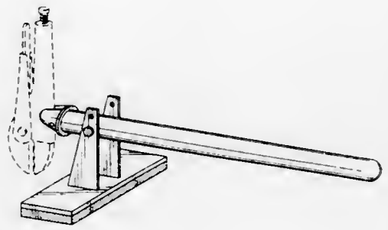
376,744
SUPPORT PLATE
Gerd Eisenblätter, Königsdorf, Germany, assignor to Gerd Eisenblatter GmbH, Geretsried, Germany
Filed Aug. 3, 1994, Ser. No. 26,695
Term of patent 14 years
U.S. Cl. D8—70



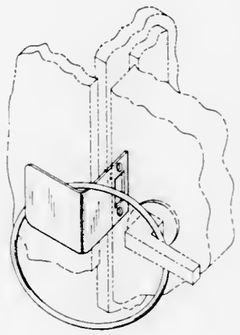
376,745
HUB DRIVING GRADE ROD
Benjamin A. Scott, Rte. 1, Box 303A, Corinth, Miss. 38834
Filed Sep. 12, 1995, Ser. No. 43,771
Term of patent 14 years
U.S. Cl. D8—75



376,746
WINDOW FRAME EXTRACTING TOOL
Monico Abeyta, 1323 S. 40th St., Tacoma, Wash. 98408
Filed Dec. 1, 1995, Ser. No. 47,369
Term of patent 14 years
U.S. Cl. D8—88



376,747
DOOR SECURITY DEVICE
Ronald E. Jackson, 216 W. Southport Rd., Indianapolis, Ind. 46217
Filed Aug. 3, 1994, Ser. No. 26,680
Term of patent 14 years
U.S. Cl. D8—330



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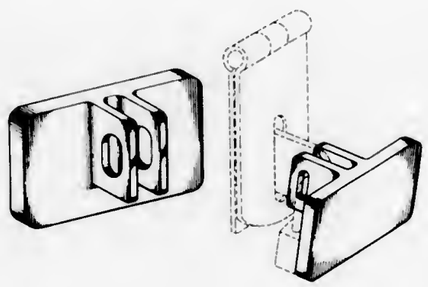
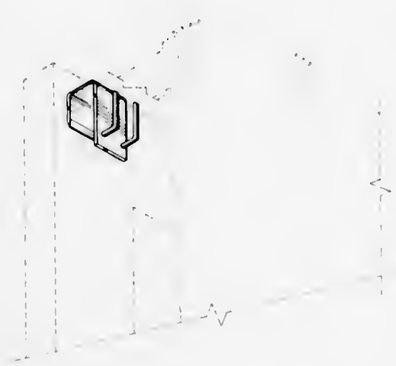
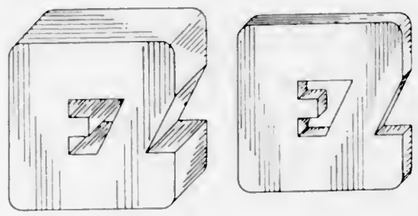
376,748
PADLOCK SHACKLE GUARD
Michael H. Small, 4966 Red Bluff Rd., Riverside, Calif. 92503, and Kevin E. Small, 270 Main St., Cedarville, Calif. 96104
Filed Jun. 29, 1995, Ser. No. 40,864
Term of patent 14 years
U.S. Cl. D8—346



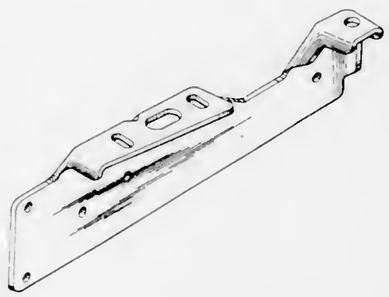
376,749
BRACKET
Allen C. Hertzog, 306 Rte. 9 Apt. 40, Cape May, N.J. 08204
Filed Feb. 15, 1995, Ser. No. 34,883
Term of patent 14 years
U.S. Cl. D8—349



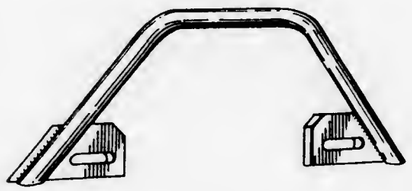
376,750
GAS DISPENSER PROP
Patrick Ferguson, 528 Ft. Washington Ave., Ft. Washington, Pa. 19034, and Rocco J. Bucci, 1720 Hood La., Maple Glen, Pa. 19002
Filed Aug. 2, 1995, Ser. No. 42,147
Term of patent 14 years
U.S. Cl. D8—354



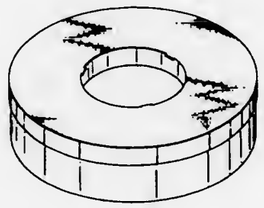
376,751
FLANGED RECEIVER MOUNTING BRACKET
Marvin L. Hanson, Vandalia, Mich.; Richard McCoy, Granger, Ind., and Jon L. Krager, Cassopolis, Mich., assignors to Reese Products, Inc., Elkhart, Ind.
Filed Oct. 20, 1995, Ser. No. 46,644
Term of patent 14 years
U.S. Cl. D8—354



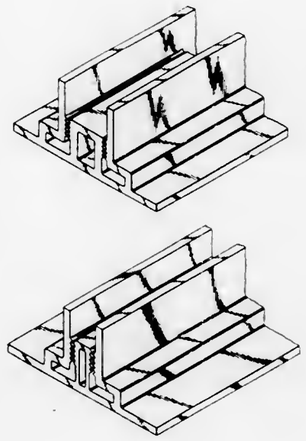
376,752
CLEAT FIXABLE TO THE TOE RAIL OF A BOAT FOR ATTACHING A SPRING LINE
Ronald Beuveniste, 3600 Ridgewood, suite 506, Montreal, Quebec, Canada
Filed Nov. 24, 1995, Ser. No. 47,006
Term of patent 14 years
U.S. Cl. D8—356



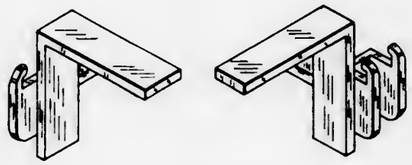
376,753
FOOT MEMBER
Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1996, Ser. No. 50,990
Claims priority, application Japan, Nov. 13, 1995, 7-33912
Term of patent 14 years
U.S. Cl. D8—374



376,754
REVEAL TRACK
Bryan Livingston; Douglas Hopkins; Harry O'Neil, and Rob Reilly, all of 885 B S. Pickett St., Alexandria, Va. 22304
Filed May 5, 1995, Ser. No. 38,419
Term of patent 14 years
U.S. Cl. D8—377



376,755
CURTAIN ROD HANGER
Lonnie E. Cox, 179 Richardson Rd., Maynard, Ark. 72444
Filed Oct. 31, 1995, Ser. No. 47,803
Term of patent 14 years
U.S. Cl. D8—380



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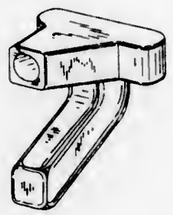
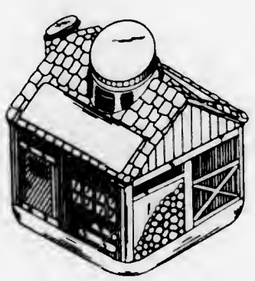
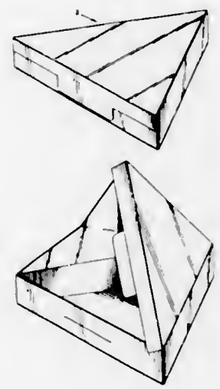
376,756
REMOVABLE FASTENER
William E. Adams, Portersville, Pa., assignor to Adams Mfg. Corp., Portersville, Pa.
Filed Dec. 29, 1995, Ser. No. 48,474
Term of patent 14 years
U.S. Cl. D8—382



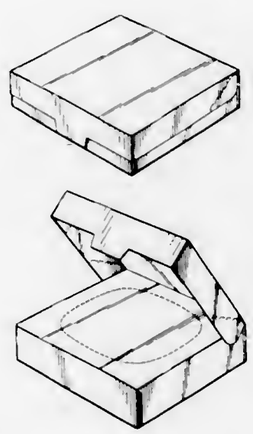
376,757
SUGAR HOUSE SYRUP CONTAINER WITH CAP
Elmer E. Kress, Southbury, Conn., and Richard G. Haas, South Deerfield, Mass., assignors to Hillside Plastics, Inc., Turners Falls, Mass.
Filed Mar. 28, 1995, Ser. No. 36,807
Term of patent 14 years
U.S. Cl. D9—322



376,758
CONTAINER
Richard D. Bradfield, Fetcham, United Kingdom, assignor to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.
Filed Jun. 7, 1995, Ser. No. 39,930
Claims priority, application United Kingdom, Dec. 9, 1994, 2043840
Term of patent 14 years
U.S. Cl. D9—430



376,759
CONTAINER
Richard D. Bradfield, Fetcham, United Kingdom, assignor to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.
Filed Jun. 7, 1995, Ser. No. 39,931
Claims priority, application United Kingdom, Dec. 9, 1994, 2043839
Term of patent 14 years
U.S. Cl. D9—432

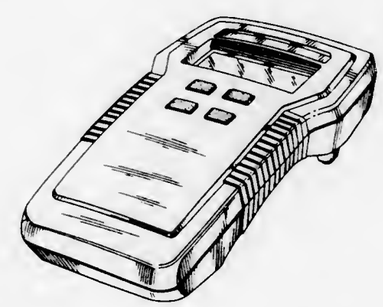


376,760
BOTTLE
Donald J. Sykes, Upper Saddle River, N.J., assignor to Marpac Industries, Inc., Waldwick, N.J.
Filed Apr. 28, 1994, Ser. No. 22,103
Term of patent 14 years
U.S. Cl. D9—500

376,761
COMBINED BOTTLE AND CAP
Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gnadt; Arnold Brown, both of Owings Mills, all of Md.; Frank E. Gonda, Fairfield, Conn., and Harry H. Houbert, Freehold, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Mar. 31, 1995, Ser. No. 36,988
The portion of the term of this patent subsequent to Sep. 10, 2014, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—528

376,762
BOTTLE
Russell R. Fenton, and Elmer H. Goss, both of East Amherst, N.Y., assignors to FWJ Plastics, Inc., Tonawanda, N.Y.
Filed Nov. 30, 1995, Ser. No. 47,269
Term of patent 14 years
U.S. Cl. D9—549

376,763
ELECTRONIC TEMPERATURE MONITOR CASING
Neal P. Flora, Anaheim; Taylor C. Fletcher, Fullerton, and Carl E. Lind, Santa Ana, all of Calif., assignors to FSW, Inc., Anaheim, Calif.
Filed Oct. 6, 1995, Ser. No. 45,060
Term of patent 14 years
U.S. Cl. D10—52



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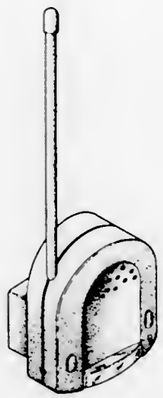
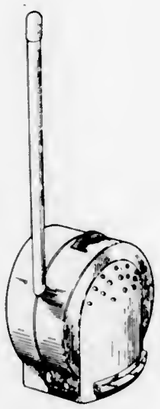
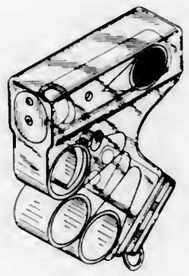
376,764
BABY MONITOR TRANSMITTER
Blair S. Barnes, Denver, Colo., assignor to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 2, 1995, Ser. No. 45,914
Term of patent 14 years
U.S. Cl. D10—104



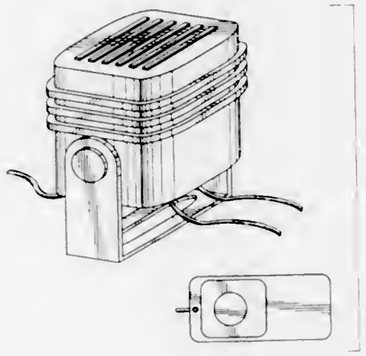
376,765
BABY MONITOR RECEIVER
Blair S. Barnes, Denver, Colo., assignor to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 6, 1995, Ser. No. 46,029
Term of patent 14 years
U.S. Cl. D10—104



376,766
HAND-HELD PERSONAL SECURITY DEVICE FOR EMITTING A CHEMICAL SPRAY AS WELL AS PROVIDING AN AUDIBLE ALARM AND A LIGHT
Richard Cranford, 401 Greensward La., A104, Del Ray Beach, Fla. 33445, and D. Robert Jordan, 1094 Fisher La., Winnetka, Ill. 60093
Filed Nov. 14, 1994, Ser. No. 31,207
Term of patent 14 years
U.S. Cl. D10—106



376,767
COMBINED REMOTE CONTROL AND ALARM UNIT
Jesus Duran, 4383 Dante Ave., Fresno, Calif. 93722
Filed Nov. 16, 1995, Ser. No. 46,832
Term of patent 14 years
U.S. Cl. D10—106

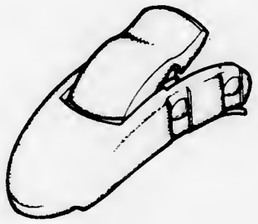


376,768
DUAL HOLE EARRING
Margaret M. Ross, 3695 Duxbury La., Lansing, Mich. 48906
Filed Jan. 30, 1995, Ser. No. 34,197
Term of patent 14 years
U.S. Cl. D11—41

376,769
ARTIFICIAL GREENERY/FLORAL ARRANGEMENT DEVICE
Gary L. Kreidler, South Chicago Heights, Ill., assignor to H.O.S. Floral Supply, Inc., South Chicago Heights, Ill.
Filed Jun. 2, 1995, Ser. No. 39,712
Term of patent 14 years
U.S. Cl. D11—155

376,770
GIFT PACKAGE ORNAMENT
Michelle Vasquez, 5297 Clato St., Kalamazoo, Mich. 49004
Filed Dec. 1, 1995, Ser. No. 47,366
Term of patent 14 years
U.S. Cl. D11—184

376,771
BUCKLE FASTENER FOR IN-LINE SKATE
Ching-Hwo Cheng, 26 Lane 93, Changlwu Road, Changhwa County, Taiwan
Filed Jan. 18, 1996, Ser. No. 49,148
Term of patent 14 years
U.S. Cl. D11—216



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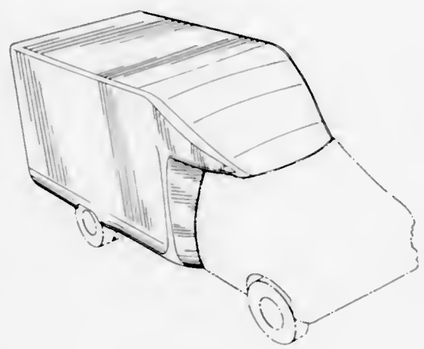
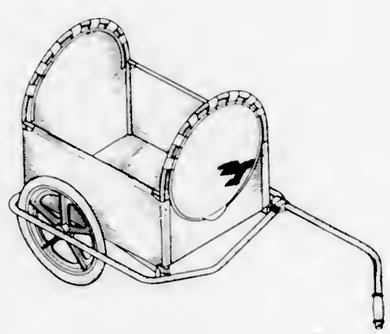
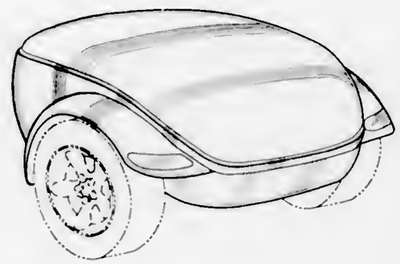
376,772
TRUCK BODY
Roger Martin, Toronto, Canada, assignor to Unicell Limited, Toronto, Canada
Filed Sep. 22, 1994, Ser. No. 28,766
Claims priority, application Canada, Mar. 22, 1994, 1994 0559
Term of patent 14 years
U.S. Cl. D12—96



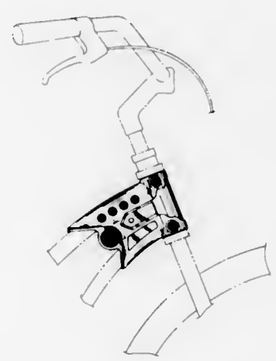
376,773
BICYCLE TRAILER
Robert Bell, 16 Oxford Street, Guelph, Ontario, Canada
Filed Aug. 29, 1994, Ser. No. 27,760
Claims priority, application Canada, Mar. 15, 1994, 1994-0493
Term of patent 14 years
U.S. Cl. D12—101



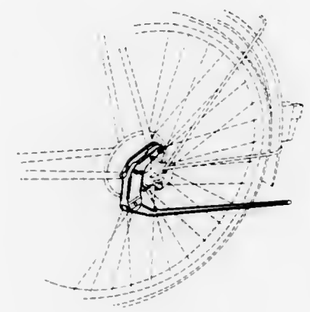
376,774
VEHICLE TRAILER BODY
Osamu Shikado, Rochester Hills; Thomas C. Sianec, Grosse Pointe Woods, and John E. Crain, Birmingham, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Dec. 19, 1995, Ser. No. 48,077
Term of patent 14 years
U.S. Cl. D12—102



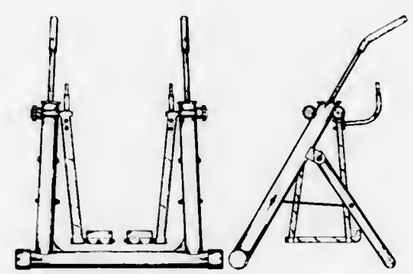
376,775
DECORATIVE BICYCLE FRAME SHROUD
Mu-tung Fang, No. 8-1, Hsin Yi Rd., Tainan City, Taiwan
Filed Dec. 7, 1995, Ser. No. 47,571
Term of patent 14 years
U.S. Cl. D12—117



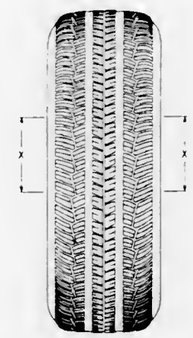
376,776
BICYCLE SUPPORT
Beat Götschi, and Hans Pletscher, both of Marthalen, Switzerland, assignors to Gebruder Pletscher AG, Marthalen, Switzerland
Division of Ser. No. 25,749, Jul. 11, 1994. This application Dec. 14, 1995, Ser. No. 47,926
Claims priority, application Switzerland, Feb. 8, 1994, DMA/002422
Term of patent 14 years
U.S. Cl. D12—120



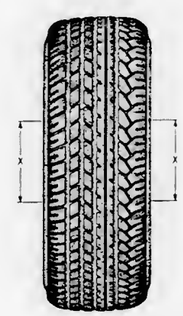
376,777
DUAL ACTION WALKER
Clive G. Stevens, 7F, No. 291, Ta Tun 4th Street, Taichung City, Taiwan
Filed Sep. 11, 1995, Ser. No. 43,711
Term of patent 14 years
U.S. Cl. D12—130



376,778
AUTOMOBILE TIRE
Yoshimasa Hashimoto; Sadakazu Takei; Toshihiko Suzuki, all of Hiratsuka; Izumi Kuramochi, and Hiroshi Tokizaki, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1995, Ser. No. 35,498
Claims priority, application Japan, Aug. 31, 1994, 6-25937
Term of patent 14 years
U.S. Cl. D12—147



376,779
AUTOMOBILE TIRE
Masatoshi Kuwajima; Sadakazu Takei, and Toshihiko Suzuki, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Mar. 15, 1995, Ser. No. 36,225
Claims priority, application Japan, Sep. 21, 1994, 6-28412
Term of patent 14 years
U.S. Cl. D12—147



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376,780

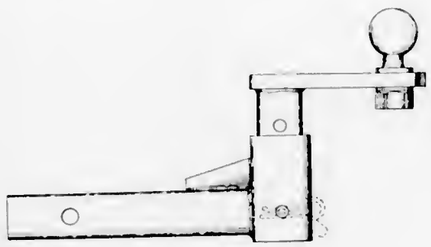
ADJUSTABLE HEIGHT HITCH BALL UNIT

Richard McCoy, Granger, Ind., assignor to Reese Products, Inc., Elkhart, Ind.

Filed Oct. 20, 1995, Ser. No. 45,459

Term of patent 14 years

U.S. Cl. D12—162



376,782

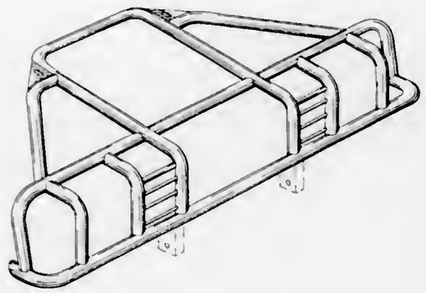
EXTENDED VEHICLE BRUSHGUARD

Mark S. Kincart, 19511 N. 53rd Dr., Glendale, Ariz. 85308

Filed Jan. 22, 1996, Ser. No. 49,286

Term of patent 14 years

U.S. Cl. D12—171



376,781

ROOF RACK SIDE SUPPORT FOR A PASSENGER CAR

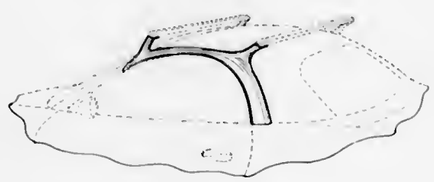
Thilo Ludewig, Leonberg, and Erhard Wolf, Stuttgart, both of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed May 12, 1995, Ser. No. 38,737

Claims priority, application Germany, Nov. 12, 1994, M 94 08 827.6

Term of patent 14 years

U.S. Cl. D12—406



376,783

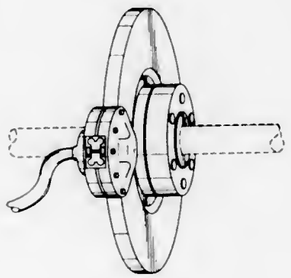
AXLE BRAKE

Manuel C. Magalhaes, 9 Saljon Ct., Centereach, N.Y. 11720

Filed Jul. 24, 1995, Ser. No. 41,758

Term of patent 14 years

U.S. Cl. D12—180



376,784

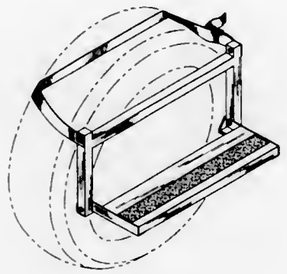
TIRE LADDER

Dennis W. Miller, Clearwater, Fla., assignor to Pasha Enterprises, Inc., Clearwater, Fla.

Filed Aug. 30, 1995, Ser. No. 43,261

Term of patent 14 years

U.S. Cl. D12—203



376,786

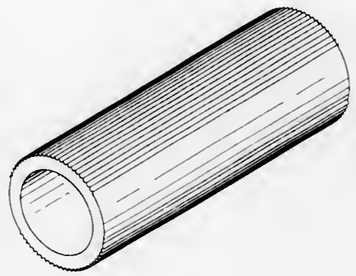
RIBBED COAXIAL WELDING CABLE

Alexander Binzel, Jr., Hallenweg 18, CH 4132 Muttenz, Switzerland

Filed May 19, 1995, Ser. No. 39,055

Term of pateot 14 years

U.S. Cl. D13—153



376,785

INVERTER

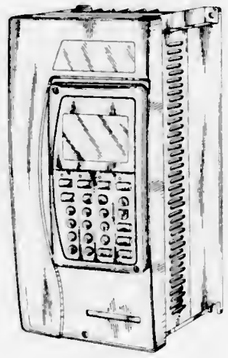
Kumiko Ikeda; Tsunehisa Yamaguchi; Wataru Suematsu; Masatake Yoshihara, and Tomoyasu Hachiro, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 26,223

Claims priority, application Japan, Jan. 27, 1994, 6-1496; Jan. 27, 1994, 6-1497

Term of patent 14 years

U.S. Cl. D13—110



376,787

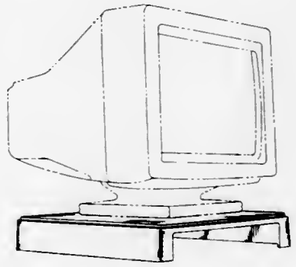
VIDEO DISPLAY PEDESTAL

Clifford T. Calfee, Richardson, Tex., assignor to Vu Ryte, Inc., Tyler, Tex.

Continuation-in-part of Ser. No. 873,035, Apr. 22, 1992. This application Dec. 14, 1994, Ser. No. 32,207

Term of patent 14 years

U.S. Cl. D14—114



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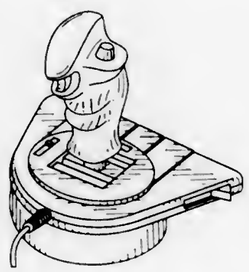
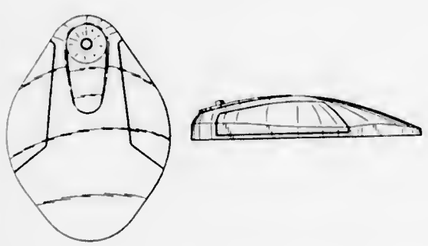
376,788
CURSOR CONTROL WITH PISTON GRIP
Robert L. Emery, Morgan Hill, Calif., assignor to MicroSpeed, Inc., Fremont, Calif.
Filed Jun. 19, 1995, Ser. No. 40,441
Term of patent 14 years
U.S. Cl. D14—114



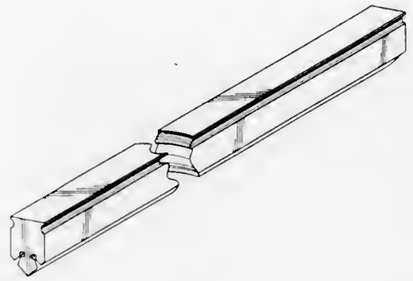
376,790
COMPUTER HAND CONTROLLER
Matthew G. Goulet, 1606 Chatham St., Racine, Wis. 53402, and Robert E. Taylor, 15 Alina St., Fairport, N.Y. 14450
Filed Dec. 21, 1995, Ser. No. 48,147
Term of patent 14 years
U.S. Cl. D14—114

376,789
ELECTRONIC CONTROL DEVICE
James D. Tickle, Thousand Oaks, Calif., assignor to Interlink Electronics, Inc., Camarillo, Calif.
Filed Nov. 13, 1995, Ser. No. 46,287
Term of patent 14 years
U.S. Cl. D14—114

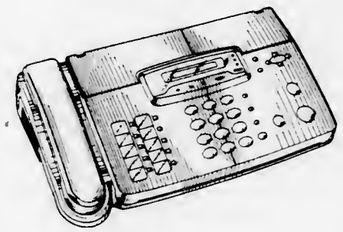


376,791
MOUSE PAD
Michael J. Schreiner, Bay Village, Ohio, assignor to Hunt Holdings, Inc., Wilmington, Del.
Filed Aug. 4, 1992, Ser. No. 924,540
Term of patent 14 years
U.S. Cl. D14—114

376,792
WINDSHIELD WIPER BLADE
Richard W. Chodkiewicz, 16217 Dale St., Detroit, Mich. 48219
Filed Dec. 8, 1995, Ser. No. 47,616
Term of patent 14 years
U.S. Cl. D12—220

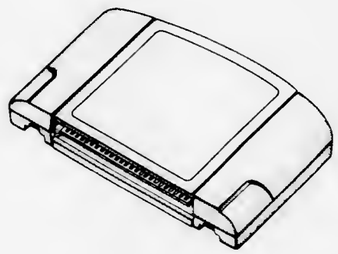


376,794
FACSIMILE
Bong W. Lim, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 16, 1996, Ser. No. 49,637
Claims priority, application Rep. of Korea, Jul. 25, 1995, 1995-14068
Term of patent 14 years
U.S. Cl. D14—118



376,793
FACSIMILE MACHINE
Keiichiro Satoh, Nara, and Hidetoshi Fujimoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 4, 1996, Ser. No. 48,577
Claims priority, application Japan, Jul. 18, 1995, 7-20796; Jul. 18, 1995, 7-20797
Term of patent 14 years
U.S. Cl. D14—118

376,795
GAME CARTRIDGE
Kenichiro Ashida, Kyoto, Japan, assignor to Nintendo of America, Inc., Redmond, Wash.
Filed May 2, 1995, Ser. No. 38,389
Claims priority, application Japan, Jan. 18, 1995, 7-961; Jan. 18, 1995, 7-962; Jan. 18, 1995, 7-963; Jan. 18, 1995, 7-964; Apr. 11, 1995, 7-10168; Apr. 17, 1995, 7-10709
Term of patent 14 years
U.S. Cl. D14—121



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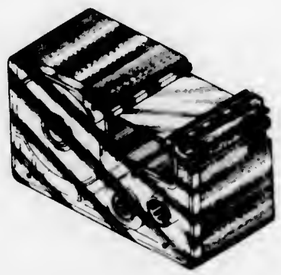
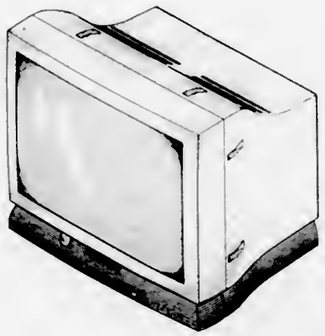
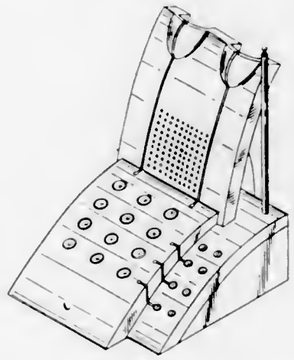
376,796
RIBBON CASSETTE FOR A VIDEO GAME MACHINE WITH SEAL PRINTER
Yukinori Hirasawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1995, Ser. No. 48,440
Term of patent 14 years
U.S. Cl. D14—121



376,798
CONSOLE TELEVISION
Thomas E. Renk, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Aug. 23, 1995, Ser. No. 46,778
Term of patent 14 years
U.S. Cl. D14—133

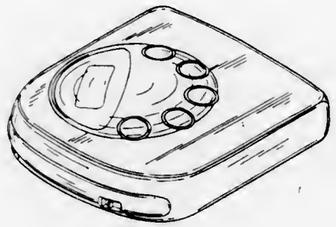


376,799
TELEPHONE BASE
Joost Godee, and Daniel Harden, both of Palo Alto, Calif., assignors to Proteg Technologies Pte. Ltd., Singapore, Singapore
Filed Aug. 14, 1995, Ser. No. 42,619
Term of patent 14 years
U.S. Cl. D14—150

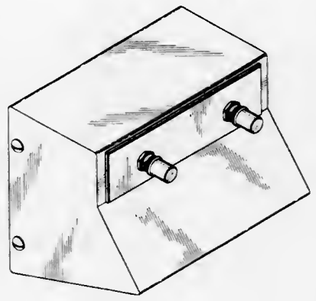


376,797
VCR PROTECTOR
John R. Harris, and Robin Ball, both of Box 2472, St. Mary's, ON, Canada
Filed Feb. 20, 1996, Ser. No. 50,436
Term of patent 14 years
U.S. Cl. D14—121

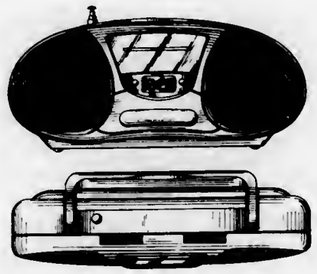
376,800
RADIO RECEIVER
Tomoyuki Shudo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 7, 1995, Ser. No. 35,790
Term of patent 14 years
U.S. Cl. D14—197



376,802
SPEAKER ENCLOSURE
Frankie J. Asencio, Columbus, Ohio, assignor to Network Entertainment Systems, Inc., Columbus, Ohio
Filed Aug. 29, 1995, Ser. No. 43,212
Term of patent 14 years
U.S. Cl. D14—213



376,801
COMBINED MINIATURE BOOM BOX AND CLOCK RADIO
James L. Hanig, Highland Park; Richard L. Ettelson, Chicago, both of Ill., and Leung Y. Mina, Victoria, Australia, assignors to Hanig & Co., Inc., Lincolnwood, Ill.
Filed Jan. 2, 1996, Ser. No. 48,520
Term of patent 14 years
U.S. Cl. D14—171



376,803
KARAOKE MICROPHONE
Kee-Woon Lee, Buchon, Rep. of Korea, assignor to Sycom International Corp., Taichung City, Taiwan
Filed Mar. 25, 1996, Ser. No. 52,150
Term of patent 14 years
U.S. Cl. D14—228

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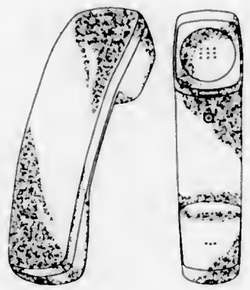
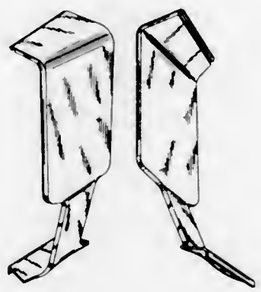
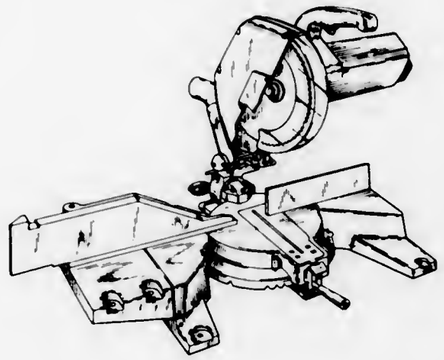
376,804
WIRELESS LOCAL LOOP HANDSET
Steven A. Mergenthaler, Boulder, Colo., and Dawn E. Beattie, Carlsbad, Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.
Filed Dec. 1, 1995, Ser. No. 47,359
Term of patent 14 years
U.S. Cl. D14—248



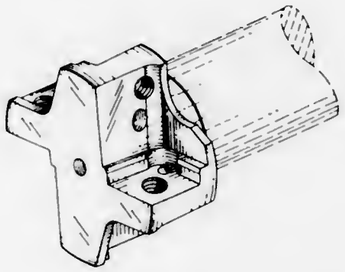
376,805
HOLDER FOR MOBILE PHONE IN VEHICLES
Ebbe Johansson, Karlsborb, Sweden, assignor to Brodit Plast AB, Karlsborg, Sweden
Filed Sep. 25, 1995, Ser. No. 44,457
Claims priority, application Sweden, Jun. 2, 1995, 95-1130
Term of patent 14 years
U.S. Cl. D14—253



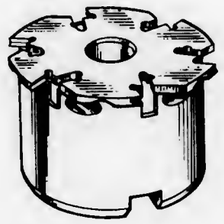
376,806
COMPOUND MITER SAW
Jeffrey S. Holly; Andrew L. Itzov, both of Menomonee Falls; Charles A. Hirsch, Brown Deer; Robert D. Davis, Oshkosh, and Richard P. Brault, Cedarburg, all of Wis., assignors to Milwaukee Electric Tool Corporation, Brookfield, Wis.
Filed Jul. 20, 1994, Ser. No. 26,145
Term of patent 14 years
U.S. Cl. D15—133



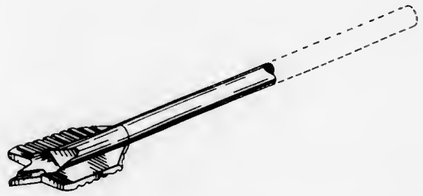
376,807
METAL SLOTTING CUTTER
Amir Satran, and Yaron Eizen, both of Kfar Vradim, Israel, assignors to Iscar Ltd., Migdal Tefen, Israel
Filed Jun. 6, 1995, Ser. No. 39,828
Claims priority, application Israel, Dec. 7, 1994, 23636
Term of patent 14 years
U.S. Cl. D15—139



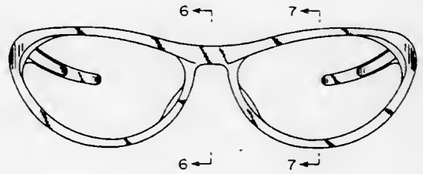
376,808
MILLING HEAD
Wlajko Mihic, Gävle, Sweden, assignor to Mircona Aktiebolog, Gavle, Sweden
Filed Sep. 20, 1995, Ser. No. 44,220
Claims priority, application Sweden, Mar. 22, 1995, 95-0597
Term of patent 14 years
U.S. Cl. D15—139



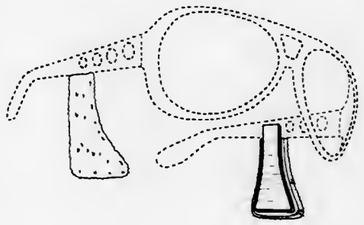
376,809
SPADE-TYPE BORING BIT
Paul A. Stone, York County, Pa.; Rickey J. Thomas, Carroll County, and Chris McKenna, Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.
Division of Ser. No. 32,861, Dec. 30, 1994. This application Nov. 7, 1995, Ser. No. 46,087
Term of patent 14 years
U.S. Cl. D15—139



376,810
FRAMES OF SUNGLASSES
Yuzuru Ohie, Higashiosaka, Japan, assignor to OGK Hanbai Co. Ltd., Osaka, Japan
Filed Jan. 22, 1996, Ser. No. 49,228
Term of patent 14 years
U.S. Cl. D16—326



376,811
PAIR OF FALSE SIDEBURNS FOR SUNGLASSES
Allen Lowe, 1148 12th St. S., Birmingham, Ala. 35205
Continuation of Ser. No. 930,048, Aug. 17, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 28,333
Term of patent 14 years
U.S. Cl. D16—341



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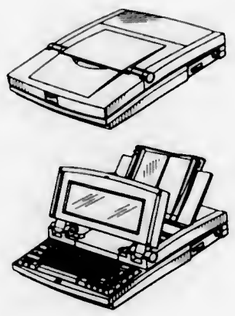
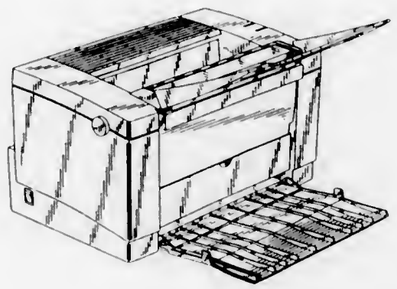
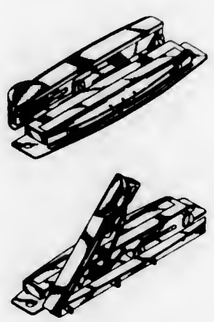
376,812
ELECTRONIC TYPEWRITER HAVING A FULL-SIZE DISPLAY SCREEN
Toshimi Chiba, Irvine, Calif., assignor to Canon Business Machines, Inc., Costa Mesa, Calif.
Filed Sep. 7, 1995, Ser. No. 43,606
The portion of the term of this patent subsequent to Oct. 29, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—1



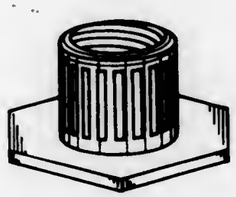
376,814
PRINTER
Tomonari Asai, and Shinji Matsumoto, both of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Dec. 7, 1994, Ser. No. 31,837
Claims priority, application Japan, Jun. 10, 1994, 6-17043
Term of patent 14 years
U.S. Cl. D18—50



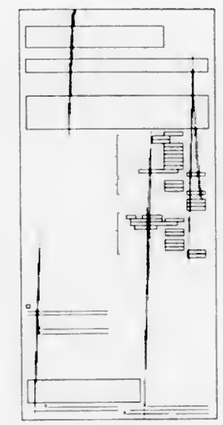
376,813
BINDING DEVICE
Andreas Haug; Tom Schönherr, both of Stuttgart, Germany, and Hiroshi Otsuka, Funabashi, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan
Filed Nov. 28, 1995, Ser. No. 47,194
Claims priority, application Japan, May 31, 1995, 7-15164
Term of patent 14 years
U.S. Cl. D18—34



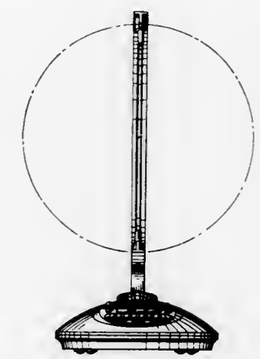
376,815
INSERT
James H. Vermillion, 2025 W. Century Way, Boise, Id. 83709
Filed Aug. 25, 1994, Ser. No. 27,632
Term of patent 14 years
U.S. Cl. D8—354



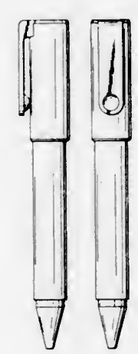
376,816
BUSINESS FORM
Jeffrey M. Sisilli, North Hollywood, Calif., assignor to The Reynolds and Reynolds Company, Dayton, Ohio
Filed Dec. 14, 1995, Ser. No. 48,777
Term of patent 14 years
U.S. Cl. D19—1



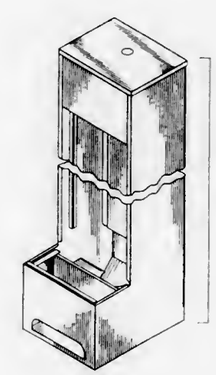
376,818
TALKING GLOBE BASE
Dennis J. Graham, Long Beach; Gregory B. Bergeron, La Habra, and Damon R. Saddler, Inglewood, all of Calif., assignors to Educational Insights, Inc., Carson, Calif.
Filed Jan. 31, 1996, Ser. No. 49,787
Term of patent 14 years
U.S. Cl. D19—61



376,817
WRITING INSTRUMENT
Maria Boix Gacia, Barcelona, Spain, assignor to Inoxcrom, S.A., Barcelona, Spain
Filed Dec. 28, 1995, Ser. No. 48,418
Term of patent 14 years
U.S. Cl. D19—51



376,819
VENDING MACHINE HOUSING
Duncan J. Milcetic, 91 Clapham Ave., Manhasset, N.Y. 11030
Continuation-in-part of Ser. No. 208,724, Mar. 9, 1994, Pat. No. 5,472,074. This application Jun. 20, 1995, Ser. No. 40,488
Term of patent 14 years
U.S. Cl. D20—1



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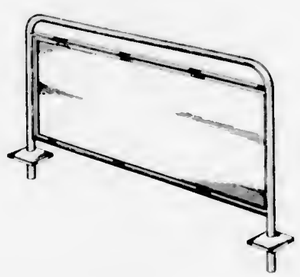
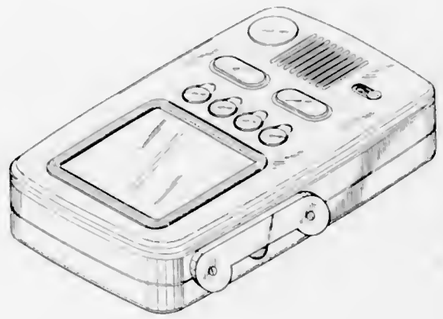
376,820
ROADSIDE ADDRESS POST
Steven K. Bosman, 539 E. Smith Rd., Bellingham, Wash. 98226
Filed Feb. 14, 1995, Ser. No. 34,839
Term of patent 14 years
U.S. Cl. D20—17

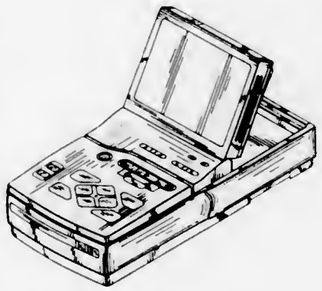
376,821
COMBINED CROWD CONTROL AND ADVERTISING DEVICE
Norman B. Hathaway, North Salem, N.Y., assignor to Stainless Image Inc., Danbury, Conn.
Filed Jul. 11, 1995, Ser. No. 41,845
Term of patent 14 years
U.S. Cl. D20—41



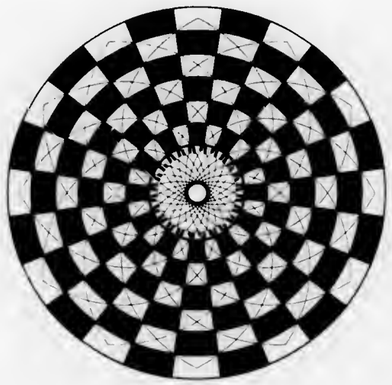
376,822
HAND-HELD ELECTRONIC GAME HOUSING
Ralph F. Osterhout, San Francisco, Calif., assignor to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Jan. 17, 1995, Ser. No. 33,610
Term of patent 14 years
U.S. Cl. D21—13



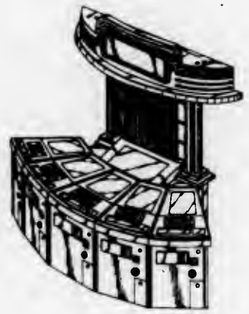
376,823
MAGNET OPTICAL DISC PLAYER COMBINED WITH DISPLAY MONITOR
Takashi Ikenaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 28, 1995, Ser. No. 47,165
Claims priority, application Japan, Jun. 7, 1995, 7-16015
Term of patent 14 years
U.S. Cl. D21—13



376,824
CHESS GAME BOARD
Clifton W. King, 715 Shawnee Dr., Nashville, Tenn. 37205
Filed Aug. 31, 1994, Ser. No. 27,844
Term of patent 14 years
U.S. Cl. D21—32

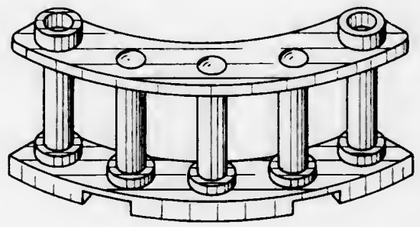


376,825
VIDEO BLACKJACK TABLE
Cory J. Hanscom, New Hope, Minn., assignor to Innovative Gaming Corporation of America, Reno, Nev.
Filed Sep. 22, 1994, Ser. No. 28,792
Term of patent 14 years
U.S. Cl. D21—37



376,826
CONTROLLER FOR GAME MACHINE
Kenichiro Ashida, Kyoto, Japan, assignor to Nintendo of America, Inc., Redmond, Wash.
Filed May 2, 1995, Ser. No. 38,390
Claims priority, applicatioo Japan, Dec. 19, 1994, 6-38779; Apr. 25, 1995, 7-11888; Apr. 25, 1995, 7-11889
Term of patent 14 years
U.S. Cl. D21—48

376,827
TOY BUILDING ELEMENT
Ib T. Skov, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland
Filed Sep. 14, 1995, Ser. No. 43,996
Term of patent 14 years
U.S. Cl. D21—108



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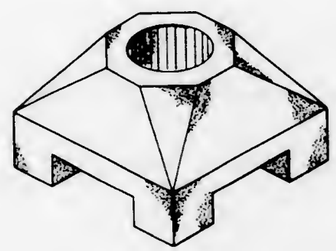
376,828
ENCLOSURE FOR AN EXERCISE APPARATUS
Kristin Conley, Lynnfield, Mass.; Jerry W. Lee, Kirkland, and Craig L. Johnson, Bothell, both of Wash., assignors to Stair-Master Sports/Medical Products, L.P., Kirkland, Wash.
Filed Jul. 24, 1995, Ser. No. 41,785
Term of patent 14 years
U.S. Cl. D21—191

376,830
GOLF TEE
William W. Bess, 5731 E. Duncan St., Mesa, Ariz. 85205
Filed Nov. 7, 1995, Ser. No. 46,101
Term of patent 14 years
U.S. Cl. D21—208

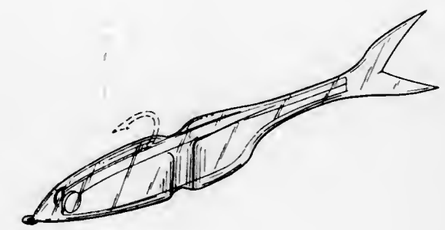


376,829
MECHANISM FOR INVERSE EXERCISE
Sue Kuo, 9 Ground Pine Ct., Dix Hills, N.Y. 11746
Filed Nov. 2, 1995, Ser. No. 45,939
Term of patent 14 years
U.S. Cl. D21—191

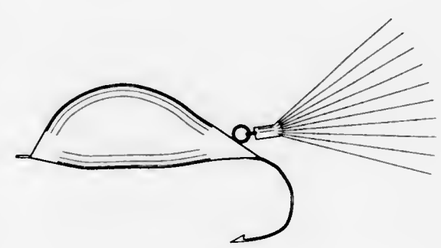
376,834
PISTOL
Harold F. Resuggan, Handsworth Wood, England, assignor to Webley & Scott Limited, Birmingham, England
Filed Jan. 12, 1995, Ser. No. 33,417
Claims priority, application United Kingdom, Aug. 11, 1994, 2040929
Term of patent 14 years
U.S. Cl. D22—104

376,832
BOW SUPPORT
Kenneth R. Mills, P.O. Box 54, Sarepta, La. 71071
Filed Sep. 18, 1995, Ser. No. 44,121
Term of patent 14 years
U.S. Cl. D22—107

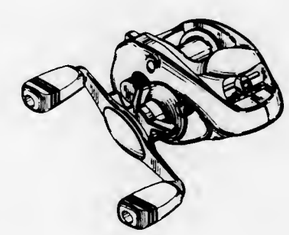
376,834
FISH LURE
Mark H. Moore, #5 Lakeview Dr., Haines City, Fla. 32789
Filed Oct. 30, 1995, Ser. No. 45,769
Term of patent 14 years
U.S. Cl. D22—133



376,833
FISHING LURE
Doyle E. Hodgin, Durham, N.C., assignor to Inspiration Lures, Inc., Apex, N.C.
Division of Ser. No. 40,192, Jun. 12, 1995, Pat. No. Des. 372,293. This application Apr. 3, 1996, Ser. No. 52,555
Term of patent 14 years
U.S. Cl. D22—128



376,835
FISHING REEL
Shinichi Asano, Musashino; Takeo Miyazaki, and Shigeo Mimura, both of Higashikurume, all of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Division of Ser. No. 24,974, Jun. 24, 1994, Pat. No. Des. 369,848. This application Oct. 3, 1995, Ser. No. 44,937
Claims priority, application Japan, Dec. 27, 1993, 5-39752; May 17, 1994, 6-13953
Term of patent 14 years
U.S. Cl. D22—140



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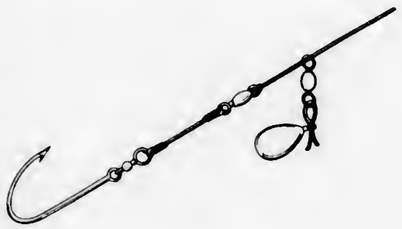
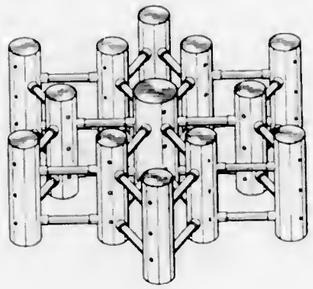
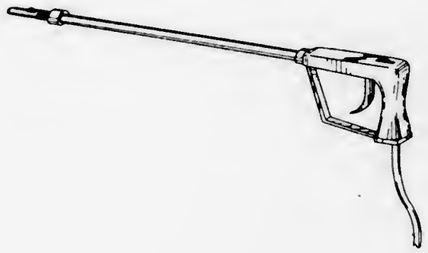
376,836
FISH HOOK WITH DETACHABLE WEIGHT
Barry W. Banks, and James W. Riddle, both of 6857 E. Sonia Dr., Tacoma, Wash. 98404
Filed Dec. 1, 1995, Ser. No. 47,371
Term of patent 14 years
U.S. Cl. D22—144



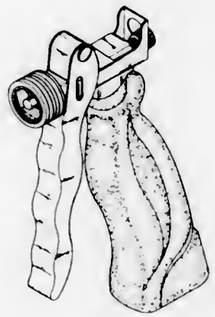
376,837
SUPPORT FOR SALT FOR USE IN A WATER SOFTENER
Steven M. Peddicord, 5310 Rustle Leaf, Arlington, Tex. 76017, and Donald B. Peddicord, 200 Oak St., Lewisville, Tex. 75067
Division of Ser. No. 850,080, Mar. 12, 1992, Pat. No. Des. 363,971. This application Aug. 2, 1995, Ser. No. 42,156
Term of patent 14 years
U.S. Cl. D23—207



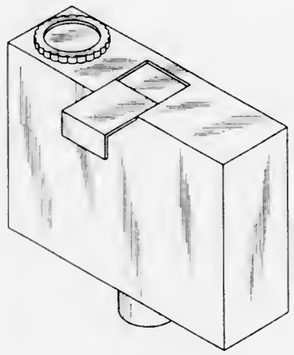
376,838
AUTOMOBILE CLEANING WAND
Elmer Potts, and Sandra L. Potts, both of P.O. Box 125, Campti, La. 71411
Filed Dec. 1, 1995, Ser. No. 47,370
Term of patent 14 years
U.S. Cl. D23—223



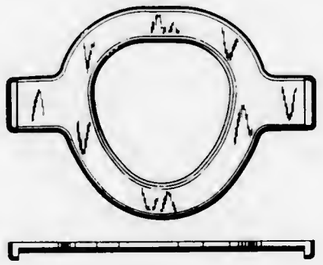
376,839
SPRAY GUN
Tsang-Chung Hung, Changhua Hsien, Taiwan, assignor to Ruey Ryh Enterprise Co., Ltd., Changhua Hsien, Taiwan
Filed Feb. 9, 1996, Ser. No. 50,176
Term of patent 14 years
U.S. Cl. D23—226



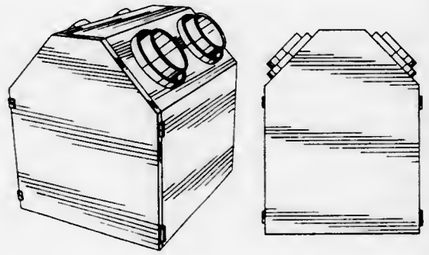
376,840
REFILLABLE TOILET TANK DISPENSER
Ernest L. Perkins, 1502 Kettering Way, Orange Park, Fla. 32073
Filed Dec. 22, 1995, Ser. No. 48,804
Term of patent 14 years
U.S. Cl. D23—313



376,841
TOILET SEAT
William E. Von Obenauer, 1943 NE. 6th Ct. #W-107, Fort Lauderdole, Fla. 33304
Filed Mar. 11, 1996, Ser. No. 51,431
Term of patent 14 years
U.S. Cl. D23—311



376,842
HEAT RECOVERY VENTILATOR
John Franklin, London; Peter K. Grinbergs, Dorchester, and Grant W. Miles, London, all of Canada, assignors to Nutech Energy Systems Inc., Canada
Filed Apr. 12, 1995, Ser. No. 37,426
Term of patent 14 years
U.S. Cl. D23—370



376,843
TABLE/DESK FAN
Brent J. Wortham, Wilmington, Calif., assignor to Envirotech Electric, Inc., Cerritos, Calif.
Filed Feb. 10, 1995, Ser. No. 34,721
Term of patent 14 years
U.S. Cl. D23—382

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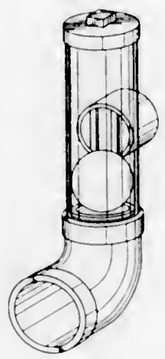
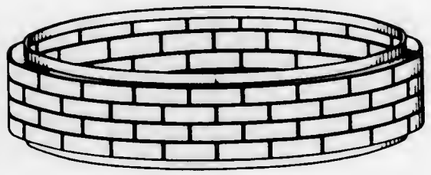
376,844
FORCED AIR VENT
Thomas Hester; Cindy Hester; Wayne Price, and Pam Price, all of Rte. 1, Box 30, Sharon, Tenn. 38255
Filed Feb. 20, 1996, Ser. No. 50,435
Term of patent 14 years
U.S. Cl. D23—393

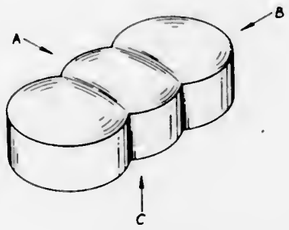


376,846
BLADE MEDALLION FOR A CEILING FAN
Julia A. Morrow, 3305 Rogers Ave., Fort Worth, Tex. 76109, assignor to Julia A. Morrow, Fort Worth, Tex.
Filed Dec. 29, 1995, Ser. No. 48,482
Term of patent 14 years
U.S. Cl. D23—411

376,845
CEILING FAN HOUSING
Li-Su Chen, 3rd F. No. 23, Yuan Huang West Road, Fung Yung, Taichung, Taiwan
Filed Jun. 19, 1995, Ser. No. 40,472
Term of patent 14 years
U.S. Cl. D23—411

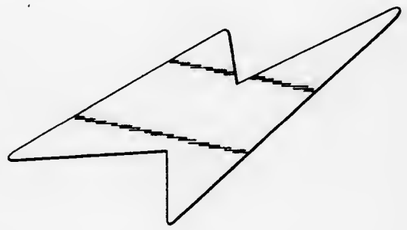


376,847
PHARMACEUTICAL TABLET
Martin R. Alden, and Alexander McCall, both of Dartford, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Filed Dec. 21, 1992, Ser. No. 2,757
Claims priority, application United Kingdom, Jun. 30, 1992, 2023937
Term of patent 14 years
U.S. Cl. D24—101



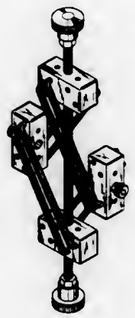
376,848
INFUSION PUMP CASSETTE
Avi Zeilig, Rosh-Ha'ain, Israel, and Jeffery Pribil, Algonquin, Ill., assignors to Sabratek Corporation, Niles, Ill.
Filed Mar. 6, 1995, Ser. No. 35,766
Term of patent 14 years
U.S. Cl. D24—111

376,850
ADHESIVE BANDAGE BACKING
Wayne K. Dunshee, and Peter W. Dunshee, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 14, 1995, Ser. No. 40,266
Term of patent 14 years
U.S. Cl. D24—189



376,849
SINGLE PIECE ORAL CAVITY CLEANING DEVICE
Nathmal S. Tarfare, 4786 Mount Vernon Blvd., Hamburg, N.Y. 14075, and Merry S. Riehm, Buffalo, N.Y., assignors to Nathmal S. Tarfare, Hamburg, N.Y.
Filed Nov. 22, 1995, Ser. No. 47,096
Term of patent 14 years
U.S. Cl. D24—152

376,851
EXPANDER DEVICE
Lawrence A. Brown, Pekin, Ind., and Karen L. Bonn, Brandenburg, Ky., assignors to Restorative Medical, Inc., Brandenburg, Ky.
Filed Dec. 29, 1995, Ser. No. 48,505
Term of patent 14 years
U.S. Cl. D24—190



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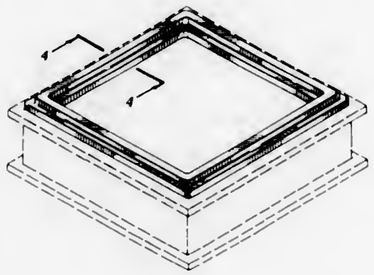
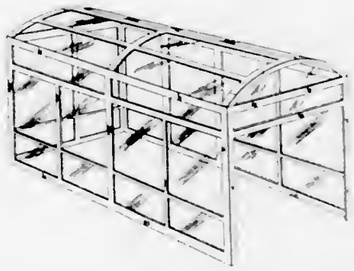
376,852
HANDRAIL RIM FOR A SPA
Don T. Allen, Norman, Okla., assignor to Mapletree Investments, Norman, Okla.
Continuation-in-part of Ser. No. 8,143, May 11, 1993. This application Sep. 24, 1993, Ser. No. 13,480
Term of patent 14 years
U.S. Cl. D24—204

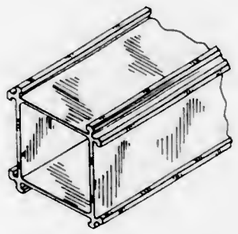


376,853
MASSAGER
Chen-Chia Hsia, 56, Shing Kung 4th Road, Tien Chung Town, Changhua, Taiwan
Filed Dec. 11, 1995, Ser. No. 47,684
Term of patent 14 years
U.S. Cl. D24—214

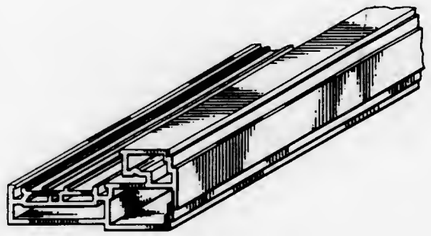
376,854
SHOPPING CART CORRAL
Anthony M. DiPaolo, and John T. Hood, both of 19221 Edison Ave., Chesterfield, Mo. 63005
Filed Jun. 9, 1995, Ser. No. 40,116
Term of patent 14 years
U.S. Cl. D25—18



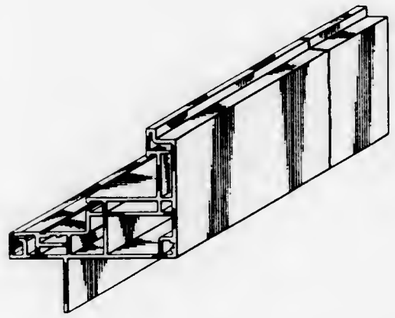
376,855
EXTRUSION
Kai H. Leung, 2D Pak Sui Yuen, 17 Science Museum Road, Tsimshatsui, Kowloon, Hong Kong
Filed Dec. 1, 1994, Ser. No. 31,623
Claims priority, application New Zealand, Jun. 2, 1994, 25941
Term of patent 14 years
U.S. Cl. D25—124



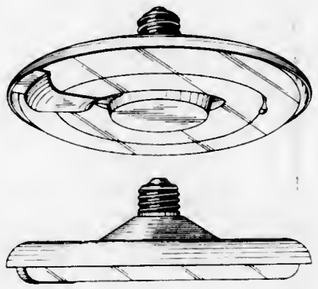
376,856
DOOR JAMB
Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada
Filed Nov. 7, 1995, Ser. No. 46,105
Term of patent 14 years
U.S. Cl. D25—124



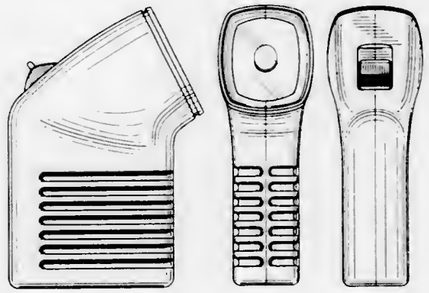
376,857
CASEMENT FRAME
Tony DiGiorgio, Woodbridge, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada
Filed Dec. 22, 1995, Ser. No. 48,253
Term of patent 14 years
U.S. Cl. D25—124



376,858
FLUORESCENT LAMP
Takeshi Matsumura, Osaka, and Masashi Sangen, Hyogo, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Aug. 24, 1995, Ser. No. 43,053
Claims priority, application Japan, Mar. 24, 1995, 7-7924
Term of patent 14 years
U.S. Cl. D26—26



376,859
FLASHLIGHT
Paul G. Garrity, Sr., Madison, Conn., assignor to Garrity Industries, Inc., Madison, Conn.
Filed Sep. 20, 1995, Ser. No. 44,206
Term of patent 14 years
U.S. Cl. D26—37



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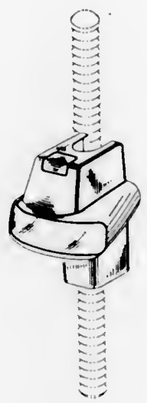
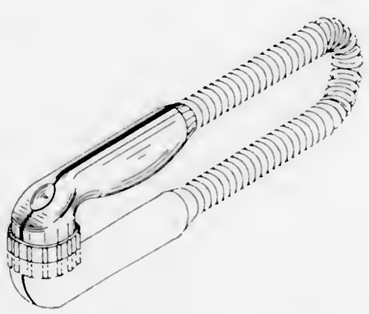
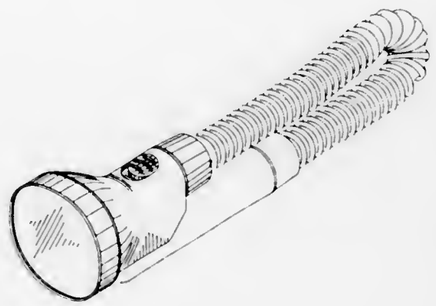
376,860
HEAD FOR A FLASHLIGHT
Paul S. Santarsiero, Avon, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,603
Term of patent 14 years
U.S. Cl. D26—43



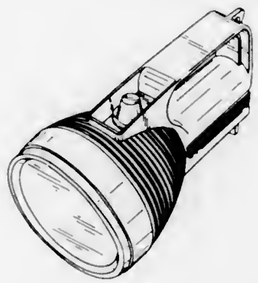
376,861
HEAD FOR A FLEXIBLE FLASHLIGHT
Scott Johnstone, Pleasant Valley, and Aaron Szymanski, Bristol, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,616
Term of patent 14 years
U.S. Cl. D26—43



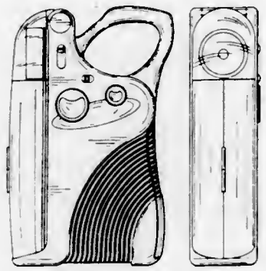
376,862
HEAD FOR A FLASHLIGHT
Richard J. Carbone, Southbury, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed May 22, 1995, Ser. No. 39,169
Term of patent 14 years
U.S. Cl. D26—43



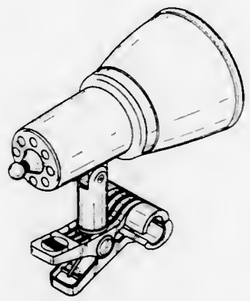
376,863
WEATHER PROOF LANTERN
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Dec. 1, 1995, Ser. No. 47,333
Claims priority, application United Kingdom, Jul. 24, 1995, 2049027
Term of patent 14 years
U.S. Cl. D26—48



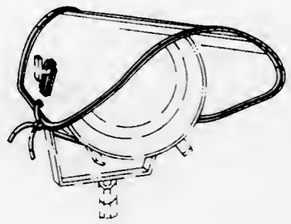
376,864
MULTI-FUNCTIONAL LANTERN
Se K. Yuen, Hong Kong, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Feb. 16, 1996, Ser. No. 50,400
Claims priority, application United Kingdom, Dec. 1, 1995, 2052407
Term of patent 14 years
U.S. Cl. D26—50



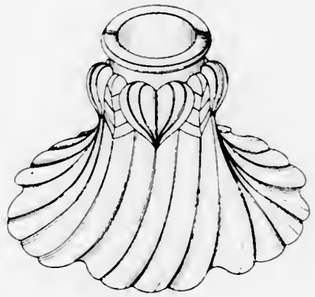
376,865
CLAMP-ON LAMP
Kam-Hoi Chan, Shatin, Hong Kong, assignor to Go-Gro Industries, Ltd., Kowloon Bay, Hong Kong
Filed Jan. 24, 1996, Ser. No. 49,370
Term of patent 14 years
U.S. Cl. D26—60



376,866
MOTION PICTURE LIGHT COVER
Robert S. Scott, 14319 Tilden Rd., Winter Garden, Fla. 34787
Filed Apr. 26, 1995, Ser. No. 38,018
Term of patent 14 years
U.S. Cl. D26—119



376,867
LAMP SHADE
San-Jhy Yan, 3F., No. 23, Yuan Huang West Rd., Fong Yuan, Taichung Hsien, Taiwan
Filed Jan. 24, 1996, Ser. No. 49,368
Term of patent 14 years
U.S. Cl. D26—127



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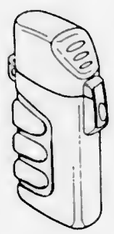
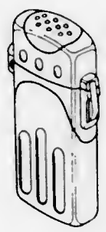
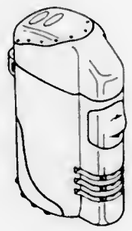
376,868
LIGHTER
Ichikawa Makoto, Tokyo, Japan, assignor to Modern Royal Co. Ltd., Tokyo, Japan
Filed Dec. 8, 1995, Ser. No. 47,822
Claims priority, application Rep. of Korea, Aug. 10, 1995, 95-15152
Term of patent 14 years
U.S. Cl. D27—157



376,870
LIGHTER
Makoto Ichikawa, Tokyo, Japan, assignor to Modern Royal Co. Ltd., Tokyo, Japan
Filed Dec. 8, 1995, Ser. No. 50,528
Claims priority, application Rep. of Korea, Aug. 10, 1995, 95-15150
Term of patent 14 years
U.S. Cl. D27—157

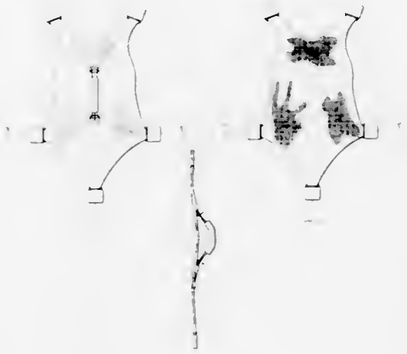


376,869
LIGHTER
Makoto Ichikawa, Tokyo, Japan, assignor to Modern Royal Co. Ltd., Tokyo, Japan
Filed Dec. 8, 1995, Ser. No. 48,765
Claims priority, application Rep. of Korea, Aug. 10, 1995, 95-15151
Term of patent 14 years
U.S. Cl. D27—157

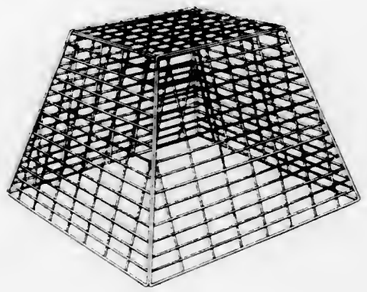


376,871
HOLDER FOR CIGARETTE LIGHTER
Michael H. Sanchez, and Rosemary A. Sanchez, both of 6103 E. Star Valley St., Mesa, Ariz. 85215
Filed Nov. 2, 1995, Ser. No. 45,921
Term of patent 14 years
U.S. Cl. D27—183

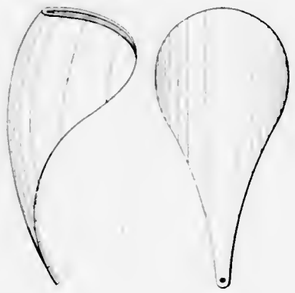
376,872
SEAT RESTRAINT
Robert W. Stroud, 9000 E. Memorial, Jones, Okla. 73049
Filed Aug. 16, 1995, Ser. No. 42,648
Term of patent 14 years
U.S. Cl. D29—101



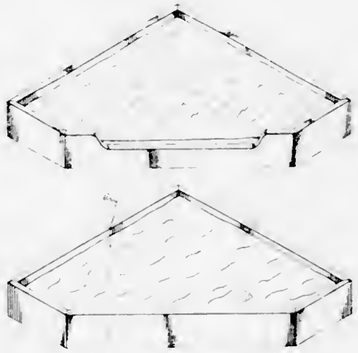
376,874
WIRE BIRD CAGE
Ricardo C. Reyes, III, 14831 Germain st., Mission Hills, Calif. 91345
Filed Apr. 27, 1995, Ser. No. 38,069
Term of patent 14 years
U.S. Cl. D30—114



376,873
HAIR SPRAY SHIELD
Marco N. Bronzini, P.O. Box 277, Zellwood, Fla. 32798
Filed Feb. 2, 1996, Ser. No. 49,868
Term of patent 14 years
U.S. Cl. D29—108



376,875
PET BED
Todd D. Glickstein, 2680 Steinburg Rd., Quakertown, Pa. 18951
Filed Sep. 1, 1994, Ser. No. 27,919
Term of patent 14 years
U.S. Cl. D30—118



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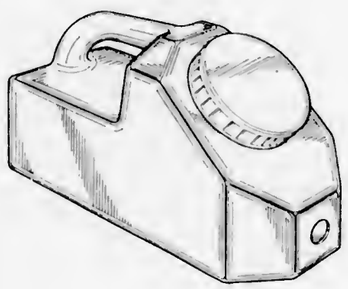
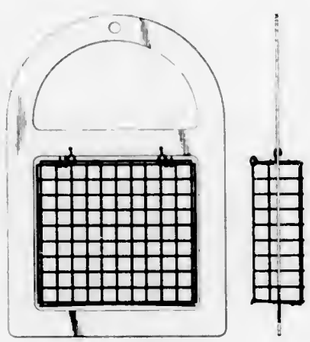
376,876
FEED BOTTLE
Ross G. McInnes, Main Road, P.O. Box 115, Waipu, New Zealand
Filed Dec. 12, 1994, Ser. No. 32,261
Claims priority, application New Zealand, Jun. 10, 1994, 259964
Term of patent 14 years
U.S. Cl. D30—121

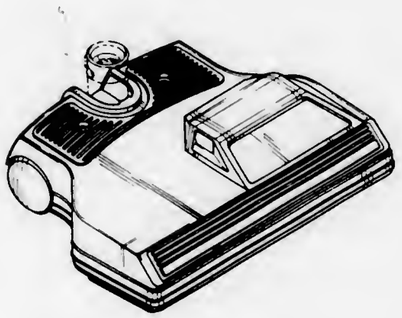


376,877
BIRD FEEDER
Stewart Hardison, P.O. Box 333, Bainbridge, N.Y. 13733
Filed Sep. 5, 1995, Ser. No. 43,470
Term of patent 14 years
U.S. Cl. D30—124

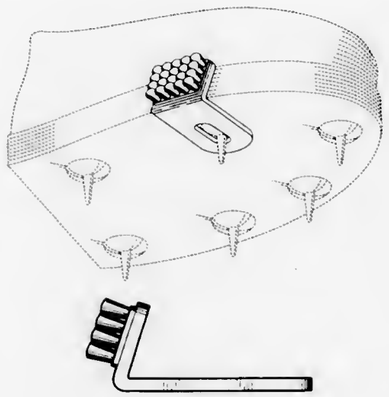


376,878
VACUUM CLEANER UPPER PORTION
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Apr. 12, 1995, Ser. No. 37,409
Term of patent 14 years
U.S. Cl. D32—31

376,879
HOUSING DESIGN FOR POWER NOZZLE
Steven R. Selewski, Cadillac; John J. Alberts, III, Marion; Dean R. Rohn, Cadillac; Todd C. Cote, Cadillac; Roy O. Erickson, Jr., Cadillac, all of Mich.; Roger H. Ramsey, Akron, Ohio; Robert G. Martinez, Akron, Ohio, and Dennis M. Futo, Strongsville, Ohio, assignors to Rexair, Inc., Troy, Mich.
Continuation-in-part of Ser. No. 146,656, Nov. 2, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 25,696
Term of patent 14 years
U.S. Cl. D32—32

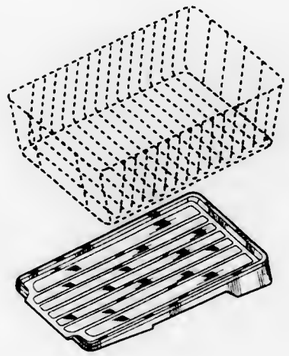


376,880
SHOE ATTACHED CLEANING IMPLEMENT
Robert F. Liebscher, 174 Cranberry Bog Rd., Danielson, Conn. 06239
Filed Oct. 25, 1995, Ser. No. 45,642
Term of patent 14 years
U.S. Cl. D32—35

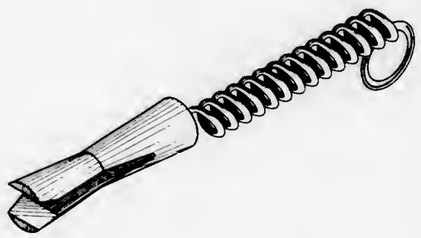


376,881
WINDSHIELD ICE SCRAPER
Arthur S. Kleinnpell, 2565 Kent Ridge Ct., Bloomfield Township, Mich. 48301, and Lori Wachler, 26524 Hendrie Blvd., Huntington Woods, Mich. 48070
Filed Jun. 12, 1995, Ser. No. 40,169
Term of patent 14 years
U.S. Cl. D32—43

376,882
TILTED DRAIN BOARD
Everett W. Cook, 11 Howard Dr., Milton, Vt. 05468
Filed Oct. 3, 1995, Ser. No. 44,897
Term of patent 14 years
U.S. Cl. D32—55



376,883
CLOTHESPIN
Michael E. Olk, and Ramona T. Olk, both of P.O. Box 113, Kimball, Minn. 55353
Filed Feb. 6, 1995, Ser. No. 34,443
Term of patent 14 years
U.S. Cl. D32—61



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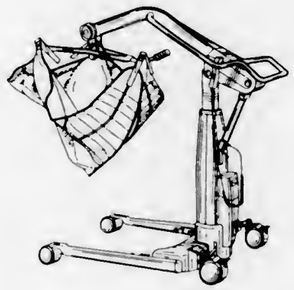
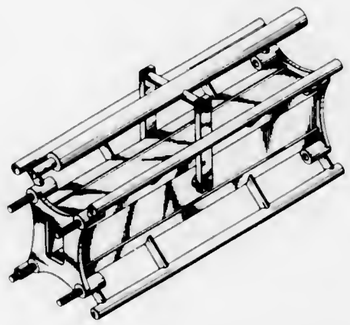
WASTE CONTAINER LID
Donald C. Presnell, and Robert J. Tokash, both of Stephens City, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Oct. 26, 1995, Ser. No. 45,670
Term of patent 14 years
U.S. Cl. D34—11

376,885
PORTABLE LIFTING UNIT
James E. Carey, 1131 E. Timberridge Dr., Prescott, Ariz. 86303, and Jesse Lacey, 25101 DeSalle, Laguna Hills, Calif. 92653
Filed Apr. 7, 1995, Ser. No. 37,235
Term of patent 14 years
U.S. Cl. D34—28

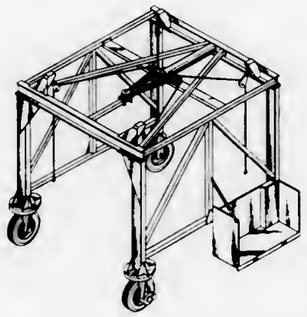
376,886
INVALID HOIST
Robert Dunn; Michael G. Gill, both of Gloucestershire; John Greaves, Hampshire; Richard I. Lees, Gloucestershire, and Bruce E. Somerton, Gloucester, all of United Kingdom, assignors to Arjo, Ltd., Gloucester, England
Filed Jun. 12, 1995, Ser. No. 40,145
Claims priority, application United Kingdom, Jan. 27, 1995, 2044806
Term of patent 14 years
U.S. Cl. D34—28



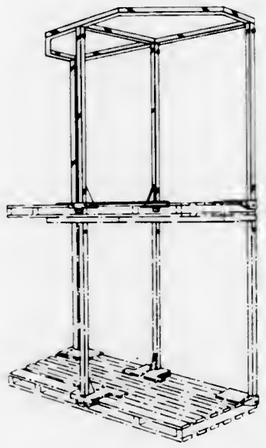
376,887
CAMERA CRANE ARM
Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, Inc., North Hollywood, Calif.
Filed Oct. 4, 1994, Ser. No. 30,014
Term of patent 14 years
U.S. Cl. D34—33



376,888
YARD CRANE
Harry Mohrlang, Brush, Colo., assignor to Mohrlang Manufacturing, Inc., Brush, Colo.
Filed Apr. 1, 1996, Ser. No. 52,708
Term of patent 14 years
U.S. Cl. D34—33



376,889
DESIGN FOR MATERIAL HANDLING SUPPORT RACK
George F. Pilla, Alliance, Ohio, assignor to Ohio Rack, Inc., Alliance, Ohio
Filed Feb. 2, 1995, Ser. No. 34,339
Term of patent 14 years
U.S. Cl. D34—38



376,890
MEMORIAL MARKER
Peggy Caldwell, 45 Jackson St., Wellsboro, Pa. 16901
Filed Jan. 5, 1995, Ser. No. 33,125
Term of patent 14 years
U.S. Cl. D99—17

376,891
MAILBOX CADDY
Frederick A. Wooten, Jr., and Alice M. Ratliff-Wooten, both of Rte. 3, Box 38, Albany, Ohio 45710
Filed Jun. 16, 1995, Ser. No. 40,384
Term of patent 14 years
U.S. Cl. D99—31

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MAILBOX WITH A HURRICANE LAMP
Frank Tsao, 5th Fl., No. 14, Lane 128, Yungyuan Rd., Yungho City, Taipei Hsien, Taiwan
Filed Aug. 8, 1995, Ser. No. 42,398
Term of patent 14 years
U.S. Cl. D99—31

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PATENTS WERE ISSUED ON THE 24th DAY OF DECEMBER, 1996

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Abe, Mariko; Ebata, Shuji; Abe, Takafumi; and Higuchi, Hirofumi, to Mitsubishi Gas Chemical Company, Inc. Process for preparing silica-titania catalyst, 5,587,349, Cl. 502-236.000.

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Abo, Keiju, to Nissan Motor Co., Ltd. System for controlling a continuously variable transmission in response to a sensed wheel deceleration, 5,586,953, Cl. 477-47.000.

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Abrams, Rolin L. Nestable and stackable storage unit, 5,586,656, Cl. 206-501.000.

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Adam, Paul; Tillmann, Heinz, deceased (by Zita M. Tillmann, executor); Werner, Michael; Renn, Peter; Reif, Joachim; and Dölling, Uwe, to TEMIC Bayern-Chemie Airbag GmbH. Hybrid gas generator for filling a gas bag, 5,586,783, Cl. 280-737.000.

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Blüthgen, Björn, to U.S. Philips Corporation; and Dupont Optical Company. Information carrier having information packets containing coded text or image information relating to different categories, arrangement for reading such information carrier and a system including such arrangement and information carrier. 5,587,979, Cl. 369-32.000.

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Kawakami, Takahiro; Ogawa, Akira; and Ichimura, Etsuo, to Kansei Corporation. Semiconductor strain gauge acceleration sensor. 5,587,531, Cl. 73-514.120.

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Kawamura, Shigeto, to Sumitomo Wiring Systems, Ltd. Connector for connecting an optical fiber cable. 5,588,080, Cl. 385-78.000.

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Kawasaki, Masayuki; Kuwasima, Yasunori; Tachibana, Hidehiko; Katsuki, Syuji; and Sueda, Akihiro, to Kabushiki Kaisha Toshiba. Booster circuit device. 5,587,683, Cl. 327-538.000.

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Keith, Robert C., to Grano Environmental Corporation. Vapor compression distillation system. 5,587,054, Cl. 202-182.000.

Kelaita, Joseph B., Jr.; and Collin, Edwin J., to General Electric Company. Circuit breaker interlock unit to prevent single phasing. 5,587,570, Cl. 200-50.010.

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Ohba, Toshimitsu; Shikata, Kiyotaka; and Sekihata, Osamu, to Fujitsu Limited. LAN-WAN-LAN communication method, and apparatus for LAN-WAN connection. 5,588,003, Cl. 370-468.000.

Ohhata, Akira: *See*—
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Ohira, Akira: *See*—
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Ohira, Takuya: *See*—
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Ohkubo, Kazuko; and Yahagi, Masahiko, to NEC Corporation. Mobile communication system capable of avoiding local congestion. 5,588,039, Cl. 379-58.000.

Ohmi, Masato: *See*—
Nakai, Sadao; Izawa, Yasukazu; Yamanaka, Masanobu; Ohmi, Masato; Akatsuka, Masanori; Yamanaka, Chiyoe; and Yonezawa, Yoshiyuki, 5,587,793, Cl. 356-367.000.

Ohmi, Tadahiro: *See*—
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Ohmura, Hitoshi; Koyakumaru, Yasuhiro; and Iketaka, Satoshi, to Toyo Kohan Co., Ltd. Corrosion resistant nickel plating steel sheet or strip and manufacturing method thereof. 5,587,248, Cl. 428-610.000.

Ohnishi, Hiroshi: *See*—
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Ohnishi, Shuhei: *See*—
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Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Albada type inverted galilean finder for camera. 5,587,844, Cl. 359-717.000.

Ohsawa, Takashi: *See*—
Kaneko, Tetsuya; and Ohsawa, Takashi, 5,587,958, Cl. 365-230.060.

Ohsawa, Tetsu, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Heat treatment apparatus and heat treatment boat. 5,586,880, Cl. 432-241.000.

Ohsawa, Yuichi: *See*—
Iwasaki, Hitoshi; Ohsawa, Yuichi; and Kondoh, Reiko, 5,587,026, Cl. 148-313.000.

Ohshima, Satoshi; Yumura, Motoo; Kuriki, Yasunori; Uchida, Kunio; and Ikazaki, Fumikazu, to Director-General of Industrial Science and Technology. Method and device for the production of fullerenes. 5,587,141, Cl. 423-445.00B.

Ohsugi, Minoru: *See*—
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Ohta, Takeo: *See*—
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Ohtaka, Kazuto: *See*—
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Ohtani, Hiroaki: *See*—
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Ohyama, Keishi, to Tatsumo Kabushiki Kaisha. Robot arm device capable of conveying an article in circumferential and radial directions. 5,587,637, Cl. 318-568.110.

Oi, Kiyotoshi: *See*—
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Oizumi, Yumiko, to Fujitsu Limited. Apparatus and method for ensuring data in external storage system. 5,588,012, Cl. 371-51.100.

Ojima, Heijiro: *See*—
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Okazaki, Yoji; Goto, Chiaki; Hyuga, Hiroaki; and Harada, Akinori, to Fuji Photo Film Co., Ltd. Optical wavelength converting apparatus. 5,588,014, Cl. 372-22.000.

Okubo, Mamoru; and Yoneyama, Koji, to Exedy Corporation. One way clutch mechanism for a torque converter. 5,586,434, Cl. 60-345.000.

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192 5,586,450
646 5,586,451

CLASS 63
19 5,586,452

CLASS 65
133.3 5,586,999
260 5,587,000

CLASS 66
148 5,586,453
193 5,586,454

CLASS 68
12.02 5,586,455
18 R 5,586,456

CLASS 70
201 5,586,457
208 5,586,458
224 5,586,459

CLASS 72
56 5,586,460
137 5,586,461
150 5,586,462
166 5,586,463
405.16 5,586,464
441 5,586,465

CLASS 73
1 D 5,587,518
1 G 5,587,519
15.52 5,587,525
25.03 5,587,520
49.1 5,587,521
54.28 5,587,522
105 5,587,523
116 5,587,524
319 5,586,466
382 G 5,587,526
439 5,587,527
462 5,587,528
504.13 5,587,529
514.12 5,587,531
514.23 5,587,530
579 5,587,532
614 5,587,533
623 5,587,534
726 5,587,535
744 5,587,536
862.392 5,587,537
863.33 5,587,538
863.52 5,587,539
864.44 5,587,540

CLASS 74
57 5,586,467
89.15 5,586,468
459 5,586,469
477 5,586,470
572 5,586,471
594.1 5,586,472

CLASS 75
743 5,587,001
770 5,587,002

CLASS 81
9.22 5,586,473
57.3 5,586,474
60 5,586,475

CLASS 82
1.11 5,586,476
126 5,586,477
133 5,586,478

CLASS 83
74 5,586,479

CLASS 84
297 S 5,587,541
322 5,587,542
411 M 5,587,543
411 R 5,587,544
600 5,587,545
609 5,587,546
645 5,587,547
659 5,587,548

CLASS 89
14.3 5,587,549

CLASS 91
169 5,586,480
376 R 5,586,481
519 5,586,482

CLASS 92
255 5,586,483

CLASS 95
123 5,587,003
157 5,587,004

CLASS 96
26 5,587,005

CLASS 99
287 5,586,484
295 5,586,485
330 5,586,486
5,586,487
331 5,586,488
419 5,586,489
421 R 5,586,490
450 5,586,491
516 5,586,492

CLASS 100
34 5,586,493
189 5,586,494
207 5,586,495

CLASS 101
93.04 5,586,496
127 5,586,498
128.4 5,586,497
211 5,586,499
327 5,586,500

CLASS 102
217 5,587,550

CLASS 104
17.2 5,586,502
241 5,586,503
282 5,586,504
283 5,586,505
368 5,586,501

CLASS 105
3 5,586,506
215.2 5,586,507

CLASS 106
1.05 5,587,006
23 5,587,007
38.51 5,587,008
244 5,587,009
287.17 5,587,010
416 5,587,011
823 5,587,012

CLASS 108
2 5,586,508
28 5,586,509

CLASS 110
345 5,586,510

CLASS 112
2.1 5,586,511

CLASS 114
65 R 5,586,512
74 A 5,586,513
230 5,586,514
255 5,586,515
362 5,586,516

CLASS 116
173 5,586,517

CLASS 117
89 5,587,013
90 5,587,014
200 5,587,015
214 5,587,016

CLASS 118
424 5,587,017
661 5,587,551
679 5,587,018
725 5,587,019

CLASS 119
14.51 5,586,518
60 5,586,519
705 5,586,520
858 5,586,521

CLASS 123
41.82 R 5,586,522
65 VB 5,586,523
73 A 5,586,524
73 B 5,586,525
90.12 5,586,526
90.15 5,586,527
90.51 5,586,528
90.65 5,586,529
188.8 5,586,530
320 5,586,531
321 5,586,532
5,586,533
325 5,586,534
352 5,586,535
5,586,536
435 5,586,537
446 5,586,538
458 5,586,539
559.1 5,586,540
574 5,586,541
609 5,586,542
684 5,586,544
696 5,586,543

CLASS 124
73 5,586,545

CLASS 126
42 5,586,546
351 5,586,547
565 5,586,548
635 5,586,549

CLASS 128
200.16 5,586,550
203.29 5,586,551
633 5,586,552
635 5,586,553
653.1 5,586,554
672 5,586,555
697 5,586,556
779 5,586,557
781 5,586,558
782 5,586,559
845 5,586,560
846 5,586,561
848 5,586,562
849 5,586,563
858 Re.35,408
898 5,586,564

CLASS 131
84.2 5,586,565

CLASS 132
200 5,586,566

CLASS 134
1 5,587,021
26 5,587,022
32 5,587,023
57 D 5,586,567

CLASS 137
15 5,586,568
116.5 5,586,569
271 5,586,570
315 5,586,571
337 5,586,572
359 5,586,573
487.5 5,586,574
488 5,586,575
559 5,586,576
596.13 5,586,577
596.18 5,586,578
614.17 5,586,579

CLASS 138
98 5,586,580

CLASS 139
304 5,586,581
430 5,586,582

CLASS 140
123.5 5,586,584

CLASS 141
21 5,586,629
83 5,586,583
93 5,586,585
98 5,586,586
196 5,586,587
285 5,586,588
349 5,586,589
386 5,586,590

CLASS 144
145.2 5,586,591

CLASS 148
101 5,587,024
274 5,587,025
313 5,587,026
320 5,587,027
403 5,587,028
438 5,587,029

CLASS 149
19.5 5,587,552
19.6 5,587,553

CLASS 152
555 5,587,030

CLASS 156
64 5,587,032
148 5,587,031
164 5,587,033
166 5,587,034
187 5,587,035
219 5,587,036
231 5,587,037
345 5,587,038
5,587,039
394.1 5,587,040
441 5,587,041
477.1 5,587,042
566 5,587,043
577 5,587,044
627.1 5,587,045
662.1 5,587,046

CLASS 159
47.300 5,587,047

CLASS 160
133 5,586,592
135 5,586,593
5,586,594
330 5,586,595

CLASS 162
7 5,587,048
40 5,587,049
198 5,587,051
273 5,587,052

CLASS 164
253 5,586,596
487 5,586,597

CLASS 165
133 5,586,598
143 5,586,599
173 5,586,600

CLASS 166
212 5,586,601
249 5,586,602

CLASS 172
21 5,586,603
5,586,604

CLASS 173
4 5,586,605
62 5,586,606
117 5,586,607

CLASS 174
37 5,587,554
49 5,587,555
74 R 5,587,556
266 5,587,557

CLASS 175
40 5,586,608
65 5,586,609
195 5,586,610
353 5,586,612
369 5,586,611

CLASS 178
18 5,587,558
5,587,559
5,587,560

CLASS 180
65.2 5,586,613

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190 5,586,614

CLASS 181

131 5,587,561
167 5,587,562
224 5,587,563
295 5,587,564

CLASS 182

48 5,586,615
222 5,586,616
238 5,586,617

CLASS 184

14 5,586,618

CLASS 187

226 5,586,619
227 5,586,620
316 5,587,565
5,587,566
395 5,587,567

CLASS 188

4 R 5,586,621
20 5,586,622
72.6 5,586,623
164 5,586,624
218 R 5,586,625
250 B 5,586,626
299 5,586,627

CLASS 190

115 5,586,628

CLASS 192

4 R 5,586,630
8 R 5,586,631
48.2 5,586,636
69.41 5,586,632
70.25 5,586,633
70.27 5,586,634
85 A 5,586,635

CLASS 198

397 5,586,637
419.1 5,586,638
690.2 5,586,639
692 5,586,640
720 5,586,641
803.11 5,586,642
853 5,586,643
5,586,644

CLASS 200

16 R 5,587,568
17 R 5,587,569
50.01 5,587,570
527 5,586,645
541 5,586,646

CLASS 202

172 5,587,053
182 5,587,054

CLASS 203

1 5,587,055
29 5,587,056

CLASS 204

228 5,587,057
290 F 5,587,058
505 5,587,059
554 5,587,060
613 5,587,061
5,587,062

CLASS 205

173 5,587,063
742 5,587,064

CLASS 206

217 5,586,647
264 5,586,648
303 5,586,649
306.1 5,586,650
310 5,586,651
315.4 5,586,674
335 5,586,652
362 5,586,653
387.1 5,586,654
388 5,586,655
501 5,586,656
705 5,586,657
711 5,586,658
768 5,586,659

CLASS 209

3 5,586,660
397 5,586,661
411 5,586,662
582 5,586,663

CLASS 210

104 5,587,065
130 5,587,066
155 5,587,067
164 5,587,089
188 5,587,068
192 5,587,069
202 5,587,070
232 5,587,071
5,587,072
372 5,587,073
411 5,587,074
5,587,075
461 5,587,076
498 5,587,077
512.1 5,587,078
603 5,587,079
5,587,080
604 5,587,081
635 5,587,082
652 5,587,083
691 5,587,084
711 5,587,085
723 5,587,086
724 5,587,087
729 5,587,088

CLASS 211

58 5,586,664
59.2 5,586,665
175 5,586,666

CLASS 212

196 5,586,667

CLASS 213

1.3 5,586,668
43 5,586,669

CLASS 215

207 5,586,670
209 5,586,671
250 5,586,672
310 5,586,673

CLASS 216

17 5,587,090

CLASS 218

60 5,587,571

CLASS 219

110 5,587,091
113 5,587,092
121.48 5,587,093
121.68 5,587,094
388 5,587,095
521 5,587,096
543 5,587,097
615 5,587,098
728 5,587,099
772 5,587,100

CLASS 220

6 5,586,675
212 5,586,676
260 5,586,677
263 5,586,678
410 5,586,679
467 5,586,680
674 5,586,681
755 5,586,682

CLASS 221

33 5,586,683
90 5,586,684
197 5,586,685
211 5,586,686
298 5,586,687

CLASS 222

61 5,586,688
92 5,586,689
105 5,586,690
113 5,586,691
166 5,586,692
182 5,586,693
183 5,586,694
396 5,586,695
603 5,587,101

CLASS 223

66 5,586,696
85 5,586,697

CLASS 224

42.24 5,586,698
219 5,586,700
243 5,586,701
521 5,586,702
601 5,586,703
605 5,586,704
628 5,586,699
631 5,586,705
671 5,586,706
684 5,586,707

CLASS 226

172 5,586,708
177 5,586,709

CLASS 227

155 5,586,710
176.1 5,586,711

CLASS 228

5.7 5,586,712
102 5,586,713
122.1 5,586,714
248.1 5,586,715

CLASS 229

110 5,586,716
116.1 5,586,717

CLASS 232

17 5,586,718

CLASS 235

98 R 5,587,572
380 5,587,573
5,587,574
384 5,587,575
462 5,587,576
472 5,587,577
492 5,587,578

CLASS 236

21 B 5,586,719
93 B 5,586,722

CLASS 237

8 R 5,586,720
12.3 B 5,586,721

CLASS 239

102.2 5,586,723
112 5,586,724
172 5,586,725
533.12 5,586,726
542 5,586,727
734 5,586,728

CLASS 241

21 5,586,729
24.22 5,586,730
56 5,586,731
168 5,586,732

CLASS 242

125.2 5,586,733
247 5,586,734

CLASS 244

53 B 5,586,735

CLASS 246

194 5,586,736
448 5,586,737

CLASS 248

73 5,586,738
74.1 5,586,739
157 5,586,740
229.26 5,586,741
545 5,586,742
671 5,586,743

CLASS 250

201.8 5,587,579
206.1 5,587,580
287 5,587,581
288 5,587,582
325 5,587,584
332 5,587,583
370.09 5,587,585
423 F 5,587,586
492.21 5,587,587

CLASS 251

61.5 5,586,744
121 5,586,745
129.04 5,586,746
129.18 5,586,747
149.8 5,586,748
315.05 5,586,749

CLASS 252

62.54 5,587,102
79.3 5,587,103
183.11 5,587,105
299.61 5,587,106
315.6 5,587,107
364 5,587,108
392 5,587,109
511 5,587,110
514 5,587,111
589 5,587,112

CLASS 254

134.3 SC 5,586,750
352 5,586,751
372 5,586,752

CLASS 256

32 5,586,753

CLASS 257

10 5,587,588
40 5,587,589
48 5,587,590
59 5,587,591
94 5,587,593
138 5,587,594
141 5,587,595
223 5,587,596
316 5,587,603
350 5,587,604
351 5,587,597
355 5,587,598
370 5,587,599
391 5,587,600
417 5,587,601
458 5,587,611
506 5,587,612
530 5,587,613
532 5,587,614
666 5,587,605
670 5,587,606
690 5,587,607
712 5,587,608
744 5,587,609
758 5,587,610

CLASS 261

116 5,587,113
124 5,587,114

CLASS 264

1.24 5,587,115
1.25 5,587,116
45.7 5,587,117
78 5,587,118
104 5,587,119
118 5,587,120
126 5,587,121
178 F 5,587,122
430 5,587,124
515 5,587,125
568 5,587,126

CLASS 269

99 5,586,754

CLASS 271

9.06 5,586,755
11 5,586,756
145 5,586,757
303 5,586,758

CLASS 273

1.5 R 5,586,759
58 C 5,586,760
261 5,586,762
285 5,586,763
293 5,586,764
299 5,586,765
309 5,586,766
349 5,586,767
411 5,586,768

CLASS 277

1 5,586,769
11 5,586,770
34 5,586,771
166 5,586,772
167.5 5,586,773
235 B 5,586,776

CLASS 280

11.22 5,586,774
5,586,777
14.2 5,586,779
38 5,586,775
40 5,586,778
275 5,586,780
708 5,586,781
730.2 5,586,782
737 5,586,783
756 5,586,784
762 5,586,785

CLASS 281

33 5,586,786

CLASS 283

67 5,586,787
81 5,586,788

CLASS 285

38 5,586,789
89 5,586,790
179 5,586,791
319 5,586,792

CLASS 292

67 5,586,793
252 5,586,794
336.3 5,586,795
346 5,586,796

CLASS 294

1.1 5,586,801

CLASS 296

26 5,586,802
146.15 5,586,798
146.6 5,586,797
203 5,586,799

CLASS 297

148 5,586,800
158.3 5,586,803
188.08 5,586,804
188.09 5,586,805
188.11 5,586,806
218.5 5,586,807
287 5,586,808
353 5,586,809
406 5,586,810
411.36 5,586,811

CLASS 303

7 5,586,812
22.4 5,586,813
116.2 5,586,814
143 5,586,815

CLASS 310

30 5,587,615
68 D 5,587,616
90.5 5,587,617
178 5,587,618
201 5,587,619
346 5,587,620

CLASS 312

301 5,586,816
334.44 5,586,817

CLASS 313

366 5,587,621
493 5,587,622
497 5,587,623
584 5,587,624
613 5,587,625
634 5,587,626

CLASS 315

169.1 5,587,627
169.3 5,587,628
200 R 5,587,629
200 T 5,587,630
403 5,587,631
507 5,587,632

CLASS 318

164 5,587,633
257 5,587,634
334 5,587,635
561 5,587,636
568.11 5,587,637
568.14 5,587,638
638 5,587,640
801 5,587,641
812 5,587,642
821 5,587,643

CLASS 320

1 5,587,644
2 5,587,645
25 5,587,646

CLASS 322

45 5,587,647

CLASS 323

269 5,587,648
282 5,587,650
312 5,587,655
369 5,587,649

CLASS 324

127 5,587,651
5,587,652
132 5,587,653
225 5,587,654
307 5,587,656
309 5,587,657
5,587,658
357 5,587,659
426 5,587,660
556 5,587,661
713 5,587,662
727 5,587,663
752 5,587,664

CLASS 326

16 5,587,665
17 5,587,666
5,587,667
36 5,587,668
38 5,587,669
83 5,587,671
93 5,587,672
5,587,673

CLASS 327

67 5,587,674
99 5,587,675
108 5,587,676
5,587,677
5,587,678
170 5,587,679
291 5,587,680
307 5,587,681
357 5,587,682
538 5,587,683
5,587,684
546 5,587,685
552 5,587,686

CLASS 330

253 5,587,687
5,587,688
254 5,587,689

CLASS 331

2 5,587,690
44 5,587,691

CLASS 333

12 5,587,692

CLASS 335

78 5,587,693

CLASS 336

65 5,587,694
84 R 5,587,695

CLASS 338

314 5,587,696

CLASS 340

392.4 5,587,697
442 5,587,698
475 5,587,699
541 5,587,700
5,587,701
542 5,587,702
572 5,587,703
573 5,587,704
628 5,587,705
825.44 5,587,706
870.09 5,587,707

CLASS 341

76 5,587,708
100 5,587,709
107 5,587,710
144 5,587,711

CLASS 342

42 5,587,712
70 5,587,713
354 5,587,714
357 5,587,715
5,587,716
359 5,587,717
443 5,587,718

CLASS 343

895 5,587,719

CLASS 345

75 5,587,720
89 5,587,721
94 5,587,722
118 5,587,723
156 5,587,724
195 5,587,725
201 5,587,726

CLASS 347

12 5,587,727
19 5,587,728
32 5,587,729
43 5,587,730
86 5,587,731
183 5,587,732
185 5,587,733

CLASS 348

10 5,587,734

14 5,587,735
65 5,587,736
208 5,587,737
302 5,587,738
347 5,587,739
373 5,587,740
416 5,587,741
441 5,587,742
473 5,587,743
556 5,587,744
626 5,587,745
708 5,587,746

CLASS 349

62 5,587,816
106 5,587,818
5,587,819
118 5,587,821
124 5,587,822
187 5,587,817

CLASS 351

105 5,587,747
208 5,587,748

CLASS 352

27 5,587,749
184 5,587,750

CLASS 353

101 5,586,818

CLASS 355

27 5,587,767
41 5,587,768
200 5,587,769
208 5,587,770
5,587,771
5,587,772
210 5,587,773
219 5,587,774
5,587,775
245 5,587,776
5,587,777
246 5,587,778
271 5,587,779
274 5,587,780
301 5,587,781
309 5,587,782
326 R 5,587,783
356 5,587,792

CLASS 356

4.01 5,587,784
28.5 5,587,785
121 5,587,786
141.1 5,587,787
246 5,587,788
338 5,587,790
345 5,587,791
367 5,587,793
375 5,587,794
432 5,587,795
445 5,587,796

CLASS 358

261.1 5,587,797
5,587,798
296 5,587,799
5,587,800
5,587,801
405 5,587,809
442 5,587,810
456 5,587,811
462 5,587,808
498 5,587,812
500 5,587,813
512 5,587,814

CLASS 359

11 5,587,815
72 5,587,820
143 5,587,823
154 5,587,824
204 5,587,825
216 5,587,826
249 5,587,827
275 5,587,828
287 5,587,829
341 5,587,830
350 5,587,831
385 5,587,832
393 5,587,833
558 5,587,834
589 5,587,835
630 5,587,836
643 5,587,837
649 5,587,838
660 5,587,839
686 5,587,840
689 5,587,841
698 5,587,842
700 5,587,843
717 5,587,844
819 5,587,845
824 5,587,846
890 5,587,847

CLASS 360

46 5,587,848
59 5,587,851
69 5,587,849
77.08 5,587,850
78.12 5,587,852
94 5,587,853
97.01 5,587,854
97.02 5,587,855
99.02 5,587,856
103 5,587,857
5,587,858
108 5,587,859
133 5,587,860

CLASS 361

14 5,587,861
42 5,587,862
44 5,587,864
45 5,587,865
90 5,587,866
93 5,587,863
118 5,587,867
231 5,587,868
301.3 5,587,869
313 5,587,870
504 5,587,871
525 5,587,872
603 5,587,873
663 5,587,874
680 5,587,875
682 5,587,876
683 5,587,877
5,587,878
685 5,587,879
687 5,587,880
695 5,587,881
705 5,587,882
723 5,587,883
728 5,587,884
777 5,587,885
781 5,587,886
794 5,587,887
802 5,587,888
809 5,587,889
826 5,587,890

CLASS 362

158 5,586,819
402 5,586,820

CLASS 363

41 5,587,891
44 5,587,892
61 5,587,893
84 5,587,894
89 5,587,895

CLASS 364

148 5,587,896
5,587,897
5,587,898
5,587,899
157 5,587,900
167.01 5,587,906
424.045 5,587,907
424.046 5,587,905
424.082 5,587,908
426.041 5,587,909
431.08 5,587,910
443 5,587,911
444.2 5,587,904
449.7 5,587,914
468.01 5,587,912
468.04 5,587,913
468.26 5,587,915
474.19 5,587,916
483 5,587,917
487 5,587,918
488 5,587,919
489 5,587,920
5,587,921
5,587,922
490 5,587,923
496 5,587,924
508 5,587,925
510 5,587,926
514 A 5,587,927
5,587,928
516 5,587,929
525 Re.35,409
551.01 5,587,930
551.02 5,587,931
556 5,587,932
558 5,587,933
571.01 5,587,934
578 5,587,935
5,587,936
5,587,937
5,587,938
724.16 5,587,939
762 5,587,940

CLASS 365

158 5,587,943
175 5,587,944
185.02 5,587,946
185.1 5,587,945
185.17 5,587,948
185.24 5,587,949
185.3 5,587,947
201 5,587,950
203 5,587,951
207 5,587,952
220 5,587,953
221 5,587,954
5,587,955
226 5,587,956
230.03 5,587,957
5,587,960
230.06 5,587,958
5,587,959
230.09 5,587,962
233 5,587,961
236 5,587,963
238.5 5,587,964

CLASS 366

139 5,586,821
247 5,586,822
274 5,586,823

CLASS 367

24 5,587,965
31 5,587,966
50 5,587,942
53 5,587,967
75 5,587,968
99 5,587,969

CLASS 368

10 5,587,970
70 5,587,971
118 5,587,972

CLASS 369

13 5,587,973
5,587,974
5,587,975
5,587,976
25 5,587,977
32 5,587,978
5,587,979
54 5,587,980
58 5,587,981
5,587,982
59 5,587,983
103 5,587,984
124 5,587,985
5,587,986
126 5,587,987
178 5,587,988
5,587,989
275.2 5,587,990
275.3 5,587,901
5,587,991
275.4 5,587,992
291 5,587,993
5,587,994

CLASS 370

228 5,587,996
248 5,587,995
253 5,587,997
289 5,587,998
337 5,588,020
346 5,588,005
352 5,587,999
428 5,588,000
462 5,588,002
468 5,588,003
516 5,588,004

CLASS 371

3 5,588,006
21.2 5,588,007
27 5,588,008
33 5,588,009
37.6 5,588,010
43 5,588,011
51.1 5,588,012

CLASS 372

19 5,588,013
22 5,588,014
45 5,588,015
46 5,588,016
49 5,588,017

CLASS 373

72 5,588,018
152 5,588,019

CLASS 374

44 5,586,824

CLASS 375

211 5,588,021
216 5,588,022
238 5,588,023
242 5,588,024
316 5,588,025
329 5,588,026
330 5,588,027
341 5,588,028
364 5,588,029
368 5,588,030

CLASS 376

287 5,588,031

CLASS 378

4 5,588,033
8 5,588,032
73 5,588,034
132 5,588,035
146 5,588,036

CLASS 379

57 5,588,037
5,588,038
58 5,588,039
59 5,588,041
5,588,042
63 5,588,043
67 5,588,044
5,588,045
5,588,046
100 5,588,047
127 5,588,048
142 5,588,049
243 5,588,051
283 5,588,052
386 5,588,053
413 5,588,054
446 5,588,055

CLASS 380

4 5,588,056
15 5,588,057
20 5,588,058
21 5,588,059
30 5,588,060
5,588,061
5,588,062

CLASS 381

24 5,588,063
69.2 5,588,064
96 5,588,065
188 5,588,066

CLASS 382

103 5,588,067
141 5,588,068
166 5,588,069
167 5,588,050
168 5,588,071
176 5,588,072
187 5,588,073
209 5,588,074
239 5,588,075

CLASS 384

450 5,586,826
5,586,827

CLASS 385

20 5,588,076
26 5,588,077
33 5,588,078
78 5,588,079
5,588,080
93 5,588,081
96 5,588,082
122 5,588,083
123 5,588,084
5,588,085
138 5,588,086
140 5,588,087

CLASS 386

2 5,587,804
26 5,587,802
33 5,587,803
46 5,587,807
68 5,587,789
5,587,805
5,587,806

CLASS 392

449 5,588,088

CLASS 395

2.14 5,588,089
23 5,588,090
24 5,588,091
109 5,588,092
5,588,093
5,588,094
116 5,588,095
135 5,588,096
137 5,588,097
5,588,098
139 5,588,099
142 5,588,100
182.03 5,588,110
182.07 5,588,111
5,588,112
182.13 5,588,113
183.01 5,588,114
183.05 5,588,115
187 5,588,136
200.03 5,588,117
200.05 5,588,118
200.15 5,588,119
5,588,120
250 5,588,121
287 5,588,122
5,588,123
306 5,588,124
326 5,588,125
5,588,103
5,588,104
5,588,105
5,588,109
340 5,588,106
344 5,588,107
348 5,588,108
376 5,588,126
5,588,127
414 5,588,128
440 5,588,129
445 5,588,130
473 5,588,131
475 5,588,132
477 5,588,133
485 5,588,134
487 5,588,135
490 5,588,137
497.04 5,588,138
500 5,588,139
5,588,140
5,588,141
5,588,142
5,588,143
555 5,588,144
5,588,145
601 5,588,146
5,588,147
5,588,148
5,588,149
5,588,150
752 5,587,902
759 5,587,903
792 5,588,101
800 5,588,151
5,588,152

CLASS 396

55 5,587,764
95 5,587,761
5,587,762
114 5,587,763
144 5,587,754
234 5,587,765
257 5,587,766
315 5,587,752
319 5,587,751
380 5,587,755
397 5,587,753
515 5,587,756
536 5,587,757
613 5,587,758
630 5,587,759
5,587,760

CLASS 400

185 5,586,828

CLASS 402

79 5,586,829

CLASS 403

59 5,586,830
305 5,586,831
344 5,586,832
359 5,586,833

CLASS 404

60 5,586,834

CLASS 405

30 5,586,835
119 5,586,837
128 5,586,836
216 5,586,838
259.1 5,586,839
267 5,586,840
286 5,586,841

CLASS 407

29.14 5,586,842
42 5,586,843
105 5,586,844
113 5,586,845

CLASS 408

72 R 5,586,846
239 A 5,586,847

CLASS 409

137 5,586,848

CLASS 410

10 5,586,849
138 5,586,850

CLASS 411

10 5,586,851
353 5,586,852
372 5,586,853
429 5,586,854

CLASS 414

160 5,586,855
462 5,586,856

CLASS 415

23 5,586,857
55.1 5,586,858
58.5 5,586,859
115 5,586,860
118 5,586,861
146 5,586,862
200 5,586,863
209.2 5,586,864
213.1 5,586,865

CLASS 416

96 A 5,586,866

CLASS 417

45 5,586,867
53 5,586,868
218 5,586,869
222.2 5,586,870
423.11 5,586,871
477.8 5,586,872
5,586,873
569 5,586,874

CLASS 418

3 5,586,875
60 5,586,876

CLASS 422

28 5,587,127
50 5,587,128
64 5,587,129
88 5,587,130
186.11 5,587,131

CLASS 423

62 5,587,132
138 5,587,133
237 5,587,134
239.1 5,587,135
5,587,136
239.2 5,587,137
242.1 5,587,138
275 5,587,139
297 5,587,140
445 B 5,587,141
658.5 5,587,142

CLASS 424

9.1 5,587,143
9.361 5,587,144
45 5,587,145
49 5,587,146
54 5,587,147
59 5,587,148
5,587,149
5,587,150
5,587,151
65 5,587,152
66 5,587,153
70.11 5,587,154
70.28 5,587,155
73 5,587,156
76.5 5,587,157
93.5 5,587,158
94.64 5,587,159
178.1 5,587,161
183.1 5,587,162
195.1 5,587,163
5,587,167
218.1 5,587,164

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255.1 5,587,166
401 5,587,168
5,587,169
5,587,170
5,587,171
5,587,172
5,587,173
5,587,174
427 5,587,175
443 5,587,176
454 5,587,177
464 5,587,178
466 5,587,179
499 5,587,180

CLASS 425

3 5,587,181
4 C 5,587,182
4 R 5,587,183
133.5 5,587,184
229 5,587,185
310 5,587,186
409 5,587,187
549 5,587,188
577 5,587,189

CLASS 426

2 5,587,190
66 5,587,191
118 5,587,192
448 5,587,193
521 5,587,194
607 5,587,195
611 5,587,196
658 5,587,197
660 5,587,198

CLASS 427

2.12 5,587,199
2.24 5,587,200
64 5,587,201
155 5,587,202
228 5,587,203
411 5,587,204
503 5,587,208
5,587,209
523 5,587,210
553 5,587,205
558 5,587,206
571 5,587,207

CLASS 428

1 5,587,211
12 5,587,213
34.5 5,587,228
40.1 5,587,214
5,587,215
64.4 5,587,216
65.4 5,587,217
67 5,587,218
68 5,587,219
71 5,587,220
96 5,587,221
192 5,587,222
195 5,587,223
5,587,224
198 5,587,225
210 5,587,226
217 5,587,227
224 5,587,229
245 5,587,230
283 5,587,231
323 5,587,232
325 5,587,233
327 5,587,234
332 5,587,235
334 5,587,236
355 5,587,237
357 5,587,238
362 5,587,239
367 5,587,240
375 5,587,241
402 5,587,242
413 5,587,243
447 5,587,244
5,587,245
511 5,587,246
523 5,587,247
610 5,587,248

CLASS 429

3 5,587,250
33 5,587,251
49 5,587,252
192 5,587,253
206 5,587,254
218 5,587,255
5,587,256
5,587,257
228 5,587,258
233 5,587,259

CLASS 430

7 5,587,260
18 5,587,261
54 5,587,262
56 5,587,263
57 5,587,264
109 5,587,265
133 5,587,266
168 5,587,267
200 5,587,268
203 5,587,269
5,587,270
204 5,587,271
257 5,587,272
269 5,587,273
270.1 5,587,274
283.1 5,587,275
440 5,587,276
458 5,587,277
533 5,587,278
567 5,587,279
5,587,280
5,587,281
637 5,587,282

CLASS 431

10 5,587,283
115 5,586,877
351 5,586,878

CLASS 432

241 5,586,880

CLASS 433

3 5,586,881
13 5,586,882
39 5,586,883
60 5,586,884
72 5,587,284
102 5,586,885
224 5,586,886

CLASS 434

20 5,586,887
258 5,586,888
327 5,586,889

CLASS 435

5 5,587,285
6 5,587,286
5,587,287
5,587,288
5,587,289
5,587,290
7.21 5,587,293
7.4 5,587,291
7.9 5,587,292
7.93 5,587,294
11 5,587,295
14 5,587,296
29 5,587,297
41 5,587,298
69.1 5,587,299
5,587,300
5,587,301
69.5 5,587,302
116 5,587,303
139 5,587,304
172.1 5,587,305
198 5,587,306
240.1 5,587,307
240.2 5,587,308
5,587,309
5,587,310
5,587,311
240.46 5,587,312
252.1 5,587,313
252.9 5,587,314
262.5 5,587,317
280 5,587,318
5,587,319
290.1 5,587,320
305.3 5,587,321
309.4 5,587,322

CLASS 436

178 5,587,323
183 5,587,324

CLASS 437

10 5,587,325
31 5,587,326
5,587,327
40 5,587,328
5,587,329
41 5,587,330
5,587,331
43 5,587,332
60 5,587,333
129 5,587,334
5,587,335
183 5,587,336
5,587,337
5,587,338
5,587,339
186 5,587,340
195 5,587,341
203 5,587,342
206 5,587,343
209 5,587,344
228
238

CLASS 439

66 5,586,890
71 5,586,891
91 5,586,892
108 5,586,893
157 5,586,894
165 5,586,895
218 5,586,896
271 5,586,897
287 5,586,898
5,586,899
310 5,586,900
342 5,586,901
352 5,586,902
5,586,903
419 5,586,904
463 5,586,905
483 5,586,906
500 5,586,907
511 5,586,908
559 5,586,909
584 5,586,910
607 5,586,911
620 5,586,912
638 5,586,913
676 5,586,914
733.1 5,586,915
752 5,586,916
5,586,917
5,586,918
757 5,586,919
857 5,586,920

CLASS 440

38 5,586,921
88 5,586,922

CLASS 445

24 5,586,879

CLASS 446

14 5,586,923
462 5,586,924

CLASS 451

35 5,586,925
59 5,586,926
88 5,586,927
177 5,586,928
213 5,586,929
548 5,586,930

CLASS 452

6 5,586,931

CLASS 454

229 5,586,932
299 5,586,933
309 5,586,934
320 5,586,935

CLASS 463

25 5,586,936
41 5,586,937

CLASS 464

92 5,586,938
106 5,586,939

CLASS 473

140 5,586,940
160 5,586,941
168 5,586,942
207 5,586,761
214 5,586,943
248 5,586,944
258 5,586,945
295 5,586,946
324 5,586,947
332 5,586,948
345 5,586,949
356 5,586,950
379 5,586,951

CLASS 474

110 5,586,952

CLASS 477

47 5,586,953
93 5,586,954
99 5,586,955

CLASS 482

74 5,586,957
79 5,586,958
96 5,586,959
111 5,586,961
129 5,586,962

CLASS 493

299 5,586,963
413 5,586,964

CLASS 494

29 5,586,965
37 5,586,966

CLASS 501

32 } 5,587,345
152 } 5,587,346
155 } 5,587,347

CLASS 502

230 5,587,348
236 5,587,349
242 B1 5,217,937

CLASS 503

201 5,587,350
227 5,587,351
5,587,352

CLASS 504

116 5,587,353

CLASS 507

137 5,587,354

CLASS 508

302 5,587,355

CLASS 510

298 5,587,104
320 5,587,356
417 5,587,357

CLASS 514

11 5,587,358
12 5,587,359
21 5,587,360
44 5,587,361
46 5,587,362
54 5,587,363
5,587,364
63 5,587,365
78 5,587,366
171 5,587,367
177 5,587,368
178 5,587,369
183 5,587,370
185 5,587,371
5,587,394
202 5,587,372
5,587,373
210 5,587,374
213 5,587,375
249 5,587,376
254 5,587,377
264 5,587,378
275 5,587,379
5,587,380
282 5,587,381
290 5,587,382
300 5,587,383
309 5,587,384
5,587,385
312 5,587,386
5,587,387
314 5,587,388
338 5,587,389
341 5,587,390
357 5,587,391
359 5,587,392
381 5,587,393
501 5,587,395
557 5,587,396
5,587,397
561 5,587,399
566 5,587,400
654 5,587,398
675 5,587,401
729 5,587,402

CLASS 522

42 5,587,403
85 5,587,404
98 5,587,405

CLASS 523

116 5,587,406
122 5,587,407
160 5,587,408
404 5,587,409
410 5,587,410

CLASS 524

17 5,587,411
47 5,587,412
200 5,587,413
394 5,587,414
458 5,587,415
492 5,587,416
495 5,587,417
504 5,587,418
527 5,587,419
572 5,587,420
591 5,587,421
779 5,587,422

CLASS 525

52 5,587,423
63 5,587,424
98 5,587,425
124 5,587,426
145 5,587,427
165 5,587,428
187 5,587,429
196 5,587,430
269 5,587,431
327.6 5,587,432
333.2 5,587,433
333.8 5,587,434
437 5,587,435

CLASS 526

59 5,587,436
68 5,587,437
88 5,587,438
142 5,587,439
153 5,587,440
238 5,587,441
238.2 5,587,442
240 5,587,443
247 5,587,444
271 5,587,445
333 5,587,446

CLASS 528

55 5,587,448
232 5,587,449
310 5,587,450
345 5,587,451
347 5,587,447
350 5,587,452
353 B1 5,138,028
488 5,587,453

CLASS 530

324 5,587,454
5,587,455
326 5,587,456
5,587,457
350 5,587,462
387.3 5,587,458
391.1 5,587,459
396 5,587,460
404 5,587,461

CLASS 534

15 5,587,463
558 5,587,464
635 5,587,465

CLASS 536

4.1 5,587,466
18.5 5,587,467
22.1 5,587,468
23.1 5,587,469
5,587,470
25.3 5,587,471
26.2 5,587,472

CLASS 540

222 5,587,473
350 5,587,474
456 5,587,475
472 5,587,476
474 5,587,478

CLASS 544

70 5,587,479
310 5,587,480

CLASS 546

146 5,587,481

CLASS 548

179 5,587,482
352 5,587,483
364.4 5,587,484
377.1 5,587,485
448 5,587,486
561 5,587,487

CLASS 549

59 5,587,488
229 5,587,489
282 5,587,490
320 5,587,491
406 5,587,492
510 5,587,493
512 5,587,494

CLASS 552

220 5,587,495
629 5,587,496
653 5,587,497

CLASS 554

69 5,587,498
85 5,587,499
98 5,587,500

CLASS 556

53 5,587,501
420 5,587,502
427 5,587,503

CLASS 558

58 5,587,504
272 5,587,505

CLASS 560

12 5,587,506
40 5,587,507
77 5,587,508
150 5,587,509

CLASS 562

496 5,587,510
513 5,587,511
565 5,587,512

CLASS 564

84 5,587,513
134 5,587,514
135 5,587,515
405 5,587,516

CLASS 568

16 5,587,517

CLASS 600

28 5,586,967
114 5,586,968

CLASS 602

19 5,586,969
26 5,586,970
58 5,586,971
76 5,586,972

CLASS 604

19 5,586,973
26 5,586,974
89 5,586,975
117 B2 4,981,472
192 5,586,976
264 5,586,977
327 5,586,978
382 5,586,979

CLASS 606

4 5,586,980
9 5,586,981
28 5,586,982
61 5,586,983
5,586,984
69 5,586,985
147 5,586,986
155 5,586,987
160 5,586,989
170 5,586,990
185 5,586,991

CLASSIFICATION OF DESIGNS

D2— 733 376,679
742 376,680
879 376,681
882 376,682
954 376,683
970 376,684
D3— 203 376,685
217 376,686
221 376,687
273 376,688
274 376,689
284 376,690
294 376,691
315 376,692
323 376,693
D4— 102 376,694
104 376,695
376,696
114 376,697
132 376,698
D6— 318 376,699
334 376,700
367 376,701
379 376,702
380 376,703
396 376,704
426 376,705
376,706
376,707
429 376,708
449 376,709
470 376,710
480 376,711
487 376,712
496 376,713
500 376,715
501 376,716
518 376,718
540 376,719
556 376,714
603 376,720
332 376,722
359 376,723
360 376,724
371 376,721
376 376,725
393 376,726
395 376,727
507 376,728
514 376,729
515 376,730
536 376,731
555 376,732
619 376,733
629 376,734
631 376,735
665 376,736
698 376,737
709 376,738
D8— 8 376,739
376,740
376,741
13 376,742
70 376,744
75 376,745
88 376,746
99 376,743
330 376,747
346 376,748
349 376,749
354 376,750
376,751
376,815
356 376,752
374 376,753
377 376,754
380 376,755
382 376,756
D9— 322 376,757
430 376,758
432 376,759
500 376,760
528 376,761
549 376,762
D10— 52 376,763
104 376,764
376,765
106 376,766
376,767
D11— 41 376,768
155 376,769
184 376,770
216 376,771
D12— 96 376,772
101 376,773
102 376,774
117 376,775
120 376,776
130 376,777
147 376,778
376,779
162 376,780
171 376,782
180 376,783
203 376,784
220 376,792
406 376,781
D13— 110 376,785
153 376,786
D14— 114 376,787
376,788
376,789
376,790
376,791
118 376,793
376,794
121 376,795
376,796
376,797
133 376,798
150 376,799
171 376,801
197 376,800
213 376,802
228 376,803
248 376,804
253 376,805
D15— 133 376,806
139 376,807
376,808
376,809
D16— 326 376,810
341 376,811
D18— 1 376,812
34 376,813
50 376,814
D19— 1 376,816
51 376,817
61 376,818
D20— 1 376,819
17 376,820
41 376,821
D21— 13 376,822
376,823
32 376,824
37 376,825
48 376,826
108 376,827
191 376,828
376,829
208 376,830
D22— 104 376,831
107 376,832
128 376,833
133 376,834
140 376,835
144 376,836
D23— 207 376,837
223 376,838
226 376,839
311 376,841
313 376,840
370 376,842
382 376,843
393 376,844
411 376,845
376,846
D24— 101 376,847
111 376,848
152 376,849
189 376,850
190 376,851
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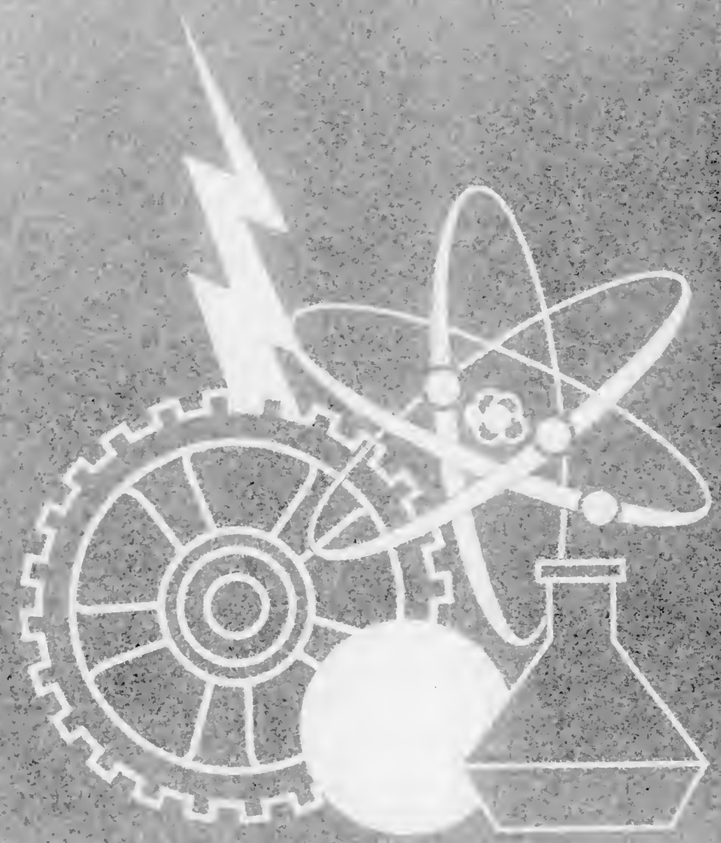
PATENTS

December 31, 1996



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December 31, 1996 Volume 1193 Number 5

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 28,1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,272,770 through 5,274,844
Reissue Patents based on the above identified patents.

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Attention is drawn to the patents which were issued on December 26,1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,888,825 through 4,890,334
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 24,1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,559,646 through 4,561,120
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED October 23,1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 34,475	07/821,348	12/14/93
(4,779,252)	(06/745,558)	(10/18/88)
4,477,929	06/545,708	10/23/84
4,477,931	06/477,020	10/23/84
4,477,934	06/478,388	10/23/84
4,477,938	06/427,711	10/23/84
4,477,941	06/338,043	10/23/84
4,477,944	06/398,185	10/23/84
4,477,946	06/450,383	10/23/84
4,477,947	06/437,283	10/23/84
4,477,948	06/477,387	10/23/84
4,477,963	06/467,406	10/23/84
4,477,966	06/361,794	10/23/84
4,477,973	06/397,976	10/23/84
4,477,986	06/456,039	10/23/84
4,477,996	06/484,175	10/23/84
4,478,010	06/555,240	10/23/84
4,478,018	06/287,590	10/23/84
4,478,020	06/330,846	10/23/84
4,478,026	06/500,880	10/23/84
4,478,031	06/404,972	10/23/84
4,478,032	06/462,674	10/23/84
4,478,035	06/358,803	10/23/84
4,478,038	06/420,139	10/23/84
4,478,039	06/501,591	10/23/84
4,478,042	06/437,849	10/23/84
4,478,044	06/290,256	10/23/84
4,478,054	06/513,182	10/23/84
4,478,062	06/413,863	10/23/84
4,478,066	06/423,129	10/23/84
4,478,070	06/440,566	10/23/84
4,478,078	06/491,634	10/23/84
4,478,085	06/408,276	10/23/84
4,478,086	06/456,504	10/23/84
4,478,089	06/393,259	10/23/84
4,478,106	06/277,976	10/23/84
4,478,109	06/306,167	10/23/84
4,478,110	06/446,205	10/23/84
4,478,117	06/375,488	10/23/84
4,478,119	06/424,724	10/23/84
4,478,120	06/441,271	10/23/84
4,478,125	06/441,788	10/23/84
4,478,126	06/423,339	10/23/84
4,478,129	06/249,925	10/23/84
4,478,130	06/245,478	10/23/84
4,478,131	06/295,393	10/23/84
4,478,145	06/538,448	10/23/84
4,478,153	06/352,793	10/23/84
4,478,154	06/330,629	10/23/84
4,478,155	06/333,448	10/23/84
4,478,161	06/459,622	10/23/84
4,478,165	06/476,665	10/23/84
4,478,166	06/219,338	10/23/84
4,478,167	06/260,314	10/23/84
4,478,170	06/510,691	10/23/84
4,478,171	06/528,811	10/23/84
4,478,174	06/580,229	10/23/84
4,478,177	06/449,517	10/23/84
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4,478,186	06/377,489	10/23/84
4,478,191	06/459,140	10/23/84
4,478,192	06/459,493	10/23/84
4,478,201	06/583,063	10/23/84
4,478,202	06/277,287	10/23/84
4,478,211	06/389,630	10/23/84
4,478,217	06/358,213	10/23/84
4,478,224	06/444,782	10/23/84
4,478,230	06/329,893	10/23/84
4,478,258	06/426,654	10/23/84
4,478,292	06/399,421	10/23/84
4,478,297	06/430,988	10/23/84
4,478,302	06/435,427	10/23/84
4,478,310	06/478,849	10/23/84
4,478,311	06/289,820	10/23/84
4,478,312	06/428,595	10/23/84
4,478,315	06/440,350	10/23/84
4,478,327	06/382,541	10/23/84
4,478,340	06/372,073	10/23/84
4,478,341	06/521,419	10/23/84
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4,478,924	06/314,456	10/23/84
4,478,927	06/384,118	10/23/84
4,478,932	06/367,679	10/23/84

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4,478,936	06/409,986	10/23/84
4,478,941	06/444,632	10/23/84
4,478,945	06/287,701	10/23/84
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4,478,973	06/575,647	10/23/84
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4,778,527	06/947,171	10/18/88
4,778,529	06/917,862	10/18/88
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5,156,880	07/650,048	10/20/92
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5,156,997	07/653,609	10/20/92
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5,157,097	07/746,730	10/20/92
5,157,101	07/532,857	10/20/92
5,157,121	07/731,460	10/20/92
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5,157,123	07/322,214	10/20/92
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5,157,130	07/499,430	10/20/92
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5,157,132	07/525,545	10/20/92
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5,157,165	07/796,440	10/20/92
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5,157,204	07/715,943	10/20/92
5,157,207	07/475,869	10/20/92
5,157,210	07/789,857	10/20/92
5,157,211	07/830,077	10/20/92
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5,157,736	07/688,173	10/20/92
5,157,758	07/611,654	10/20/92
5,157,769	07/860,293	10/20/92

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,693,399, Re. S.N. 08/731,975, Oct. 23, 1996, Cl. 222/480, TWO-FLAP CLOSURE, John R. Hickman, et. al., Owner of Record: *Weatherchem Corp., Twinsburg, Ohio,* Attorney or Agent: Howard G. Shimola, Ex. Gp.: 3104

5,108,040, Re. S.N. 08/454,520, Mar. 30, 1995, Cl. 241/260.1, TAPERED AUGER SHREDDER, Larry E. Koeing, Owner of Record: *Inventor,* Attorney or Agent: Theodore D. Lienesch, Ex. Gp.: 3206

5,150,037, Re. S.N. 08/740,509 Oct. 30, 1996, Cl. 324, PARTICLE DETECTOR AND PARTICLE DETECTING APPARATUS HAVING THE DETECTOR, Chihiro Kouzuki, Owner of Record: *Inventor,* Attorney or Agent: Felix J. D'Ambrosio, Ex. Gp.: 2213

5,163,575, Re. S.N. 08/718,052, Sept. 11, 1996, Cl. 220/276.000, CONTAINER WITH CURLED TAMPER-EVIDENT BAND TO RETAIN CLOSURE, Daniel Luch, et. al., Owner of Record: *Heller Financial Inc., Chicago, Ill.,* Attorney or Agent: Julian Caplan, Ex. Gp.: 3207

5,192,629, Re. S.N. 08/732,536, Oct. 15, 1996, Cl. 429/197, HIGH-VOLTAGE-STABLE ELECTROLYTES FOR $Li+xMn_2O_4$/CARBON SECONDARY BATTERIES, Dominique Guyomard, et. al., Owner of Record: *Bell Communications Research, Inc., Livingston, N.J.,* Attorney or Agent: Lionel N. White, Ex. Gp.: 1111

5,300,801, Re. S.N. 08/628,287, April 5, 1996, Cl. 257/309, STACKED CAPACITOR CONSTRUCTION, Guy Blalock, et. al., Owner of Record: *Micron Technology, Inc. Boise, Id.* , Attorney or Agent: James R. Duzan, Ex. Gp.: 2503

5,342,666, Re. S.N. 08/734,339, Oct. 21, 1996, Cl. 428/46, INJECTION MOLDED PLASTIC ARTICLE WITH INTEGRAL WEATHERABLE PIGMENTED FILM SURFACE, Thomas M. Ellison, et. al., Owner of Record: *Rexam Industries Corp., Charlotte, N.C.,* Attorney or Agent: Raymond O. Linker, Jr., Ex. Gp.: 1315

5,358,128, Re. S.N. 08/723,481, Oct. 9, 1996, Cl. 211/75, BOTTLE RACK FOR REFRIGERATED DISPLAY, Paul Belokin, et. al., Owner of Record: *Inventors,* Attorney or Agent: Jack A. Kanz, Ex. Gp.: 3505

5,359,171, Re. S.N. 08/738,295, Oct. 25, 1996, Cl. 219/93, PARTS FEEDING DEVICE, Yoshitaka Aoyama, Owner of Record: *Inventor,* Attorney or Agent: Morris Liss, Ex. Gp.: 2106

5,409,861, Re. S.N. 08/734,784, Oct. 15, 1996, Cl. 437/195, METHOD OF FORMING A VIA PLUG IN A SEMICONDUCTOR DEVICE, Kyeon K. Choi, Owner of Record: *Hyundai Electronics Industries Co. Ltd., Kyungki-Do, Korea,* Attorney or Agent: Richard T. Ogawa, Ex. Gp.: 1104

5,463,352, Re. S.N. 08/725,913, Oct. 4, 1996, Cl. 331/1R, SUPPLY VOLTAGE TOLERANT PHASE-LOCKED LOOP

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CIRCUIT, Dao-Long Chen, Owner of Record: *Symbio's Logic Inc., Fort Collins, Colo.*, Attorney or Agent: Donald F. Zinger, Ex. Gp.: 2502

5,485,089, Re. S.N. 08/747,723, Nov. 12, 1996, Cl. 324/346, METHOD AND APPARATUS FOR MEASURING DISTANCE AND DIRECTION BY MOVABLE MAGNETIC FIELD SOURCE, Arthur F. Kurkes, Owner of Record: *Vector Magnetics Inc., Ithaca, N.Y.*, Attorney or Agent: George M. Coope, Ex. Gp.: 2215

5,536,539, Re. S.N. 08/736,410, Oct. 24, 1996, Cl. 428/31, INJECTION MOLDED PLASTIC ARTICLE WITH INTEGRAL WEATHERABLE PIGMENTED FILM SURFACE, Thomas M. Ellison, Owner of Record: *Rexam Industries Corp., Charlotte, N.C.*, Attorney or Agent: Raymond O. Linker, Jr., Ex. Gp.: 1315

Commissioner Ordered Reexaminations

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.2(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.24(a)(5) and 1.525(b)).

5,550,709, Reexam. No. 90/004,442, Nov. 29, 1996, Cl. 361/684, EXTERNAL STORAGE DEVICE, Hiroshi Iwasaki, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Finnegan Henderson Farabow Garrett & Dunner, Washington, D.C., Ex. Gp.: 2103, Requester: Commissioner of Patents and Trademarks, Washington, D.C.

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,587,796, Reexam. No. 90/004,456, Nov. 19 1996, Cl. 053/588, PACKAGING MACHINE, Matti Haliola, Owner of Record: *Newtec International, Aix-Les-Bains Cedex, France*, Attorney or Agent: Steven W. Weinrieb, Schwartz & Weinrieb, Arlington, Va., Ex. Gp.: 3201, Requester: Owner

4,949,718, Reexam. No. 90/004,457, Nov. 12, 1996, Cl. 607/105, INTRAUTERINE CAUTERIZING APPARATUS, Robert S. Newirth, et. al., Owner of Record: *Gynelab Prod., Raleigh, N.C.*, Attorney or Agent: Patrick J. Birdie, Kenyon & Kenyon, New York, N.Y., Ex. Gp.: 3311, Requester: Benton S. Duffett, Burns, Doane, Swecker & Mathis, Alexandria, Va.,

5,105,808, Reexam. No. 90/004,458, Nov. 12, 1996, Cl. 607/, INTRAUTERINE CAUTERIZING METHOD, Robert S. Newirth, et. al., Owner of Record: *Gynelab Products, Raleigh, N.C.*, Attorney or Agent: Kenyon & Kenyon, New York, N.Y., Ex. Gp.: 3311, Requester: Benton S. Duffett, Burns, Doane, Swecker & Mathis, Alexandria, Va.,

5,166,178, Reexam. No. 90/004,459, Nov. 19, 1996, Cl. 514/573, OCULAR HYPOTENSIVE AGENTS, Ryuzo Ueno, et. al., Owner of Record: *R-Tech Ueno, Ltd., Osaka-Shi, Japan*, Attorney or Agent: Louis Gubinsky, Shugrue Mion Zino Mac Peak & Seas, Washington, D.C., Ex. Gp.: 1209, Requester: Owner

5,550,709, Reexam. No. 90/004,442, Nov. 29, 1996, Cl. 361/684, EXTERNAL STORAGE DEVICE, Hiroshi Iwasaki, Owner of Record: *Kabushiki Kaisha Toshiba, Kawasaki-Shi, Japan*, Attorney or Agent: Finnegan Henderson Farabow Garrett & Dunner, Washington, D.C., Ex. Gp.: 2103, Requester: Commissioner of Patents and Trademarks, Washington, D.C.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 02, 1996 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
107,461	71/087,546	11/30/1915
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616,897	71/680,043	11/29/1955
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1,025,799	73/042,119	11/25/1975
1,025,800	73/042,323	11/25/1975
1,025,806	73/045,695	11/25/1975
1,025,808	73/045,698	11/25/1975
1,025,809	73/045,699	11/25/1975
1,025,814	73/005,495	11/25/1975
1,025,817	73/013,222	11/25/1975
1,025,821	73/031,219	11/25/1975
1,025,826	73/039,191	11/25/1975
1,025,832	73/034,014	11/25/1975
1,025,833	73/035,124	11/25/1975
1,025,835	73/037,367	11/25/1975
1,025,839	73/039,665	11/25/1975
1,025,841	73/049,339	11/25/1975
1,025,843	73/027,662	11/25/1975
1,025,846	73/045,504	11/25/1975
1,025,847	73/045,505	11/25/1975
1,025,848	73/047,418	11/25/1975
1,025,849	73/048,419	11/25/1975
1,025,852	73/031,513	11/25/1975
1,025,859	73/046,216	11/25/1975
1,025,860	73/003,041	11/25/1975
1,025,862	73/010,328	11/25/1975
1,025,863	73/010,574	11/25/1975
1,025,865	73/020,449	11/25/1975
1,025,866	73/024,064	11/25/1975
1,025,870	73/026,615	11/25/1975
1,025,871	73/031,031	11/25/1975
1,025,872	73/031,326	11/25/1975
1,025,874	73/043,000	11/25/1975
1,025,878	73/024,102	11/25/1975
1,025,880	73/029,929	11/25/1975
1,025,884	73/036,578	11/25/1975
1,025,886	73/043,059	11/25/1975
1,025,887	73/007,811	11/25/1975
1,025,888	73/019,058	11/25/1975
1,025,892	73/041,631	11/25/1975
1,025,895	73/021,656	11/25/1975
1,025,899	73/036,309	11/25/1975

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Reg. Number	Serial Number	Reg. Date
1,025,900	73/036,310	11/25/1975
1,025,903	73/035,173	11/25/1975
1,025,905	73/011,672	11/25/1975
1,025,906	73/014,297	11/25/1975
1,025,908	73/018,858	11/25/1975
1,025,924	73/039,931	11/25/1975
1,025,925	73/039,932	11/25/1975
1,025,928	73/041,604	11/25/1975
1,025,930	73/044,867	11/25/1975
1,025,933	72/420,906	11/25/1975
1,025,938	72/458,380	11/25/1975
1,025,942	72/446,648	11/25/1975
1,025,947	72/461,497	11/25/1975
1,025,949	72/429,550	11/25/1975
1,025,950	72/423,176	11/25/1975
1,025,951	72/442,063	11/25/1975
1,025,952	72/370,162	11/25/1975
1,025,954	72/448,580	11/25/1975
1,025,963	73/034,117	11/25/1975
1,025,965	73/016,821	11/25/1975
1,025,966	73/019,689	11/25/1975
1,025,968	73/022,242	11/25/1975
1,025,974	73/036,559	11/25/1975

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrants at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Beauty Concepts Pty. Ltd., McLean, Va., Reg. No. 1,598,057, for the mark "SUN BALANCE", Canc. No. 24,625.

Weinmann Aktiengesellschaft, New York, N.Y., Reg. No. 1,114,056, for the mark "WEINMANN CARRERA", Canc. No. 25,423.

Exquisite Form Industries, Inc., Pelham Manor, N.Y., Reg. No. 660,160, for the mark "CO STAR" and Design, Canc. No. 25,216.

Colony Sportswear, Inc., Statesville, N.C., Reg. No. 1,771,531, for the mark "COLONY BAY", Canc. No. 23,908.

Pet Peeve, Inc., Hopkins, Minn., Reg. No. 1,144,341, for the mark "PET PEEVE AND DESIGN", Canc. No. 23,902.

Margaret Parker dba Lew Parker Industries, Birmingham, Ala., Reg. No. 677,935, for the mark "DELAY", Canc. No. 25,206.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Service by Publication

A petition to cancel the registrations identified below having been filed, and a copy of the petitions together with the notice of institution of such proceeding is being sent to registrant at its last known address. Simultaneously therewith, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, or unless an answer or other response to the petition is filed within forty days after the mailing of the institution notice, or within an extension of time therefor, the cancellation will proceed as in the case of default.

Aceco Inc., Houston, Tex., Reg. No. 1,391,871, for the mark "AUTO CHECK" and design, Canc. No. 25,370.

Aceco Inc., Houston, Tex., Reg. No. 1,391,870, for the mark "AUTO CHECK", Canc. No. 25,371.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Registration To Practice

The following person successfully passed the registration examination that was held April 13, 1994, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before February 14, 1997.

Horie, Tadashi, 441 E. Erie, #5803, Chicago, Ill., 60611

October 23, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held November 2, 1994, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before February 14, 1997.

Yip, Gwendolyn H., 129 Truman Rd., Newton, Mass., 02159

October 23, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Erratum

John M. Pollaro (Reg. No. 27,670) and Thomas J. Vetter (Reg. No. 30,597) were listed in the Official Gazette dated September 3, 1996, as being removed from the register. Their names were published in error. We regret any inconvenience the publication may have caused.

December 6, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment & Discipline

Reinstatement to Register

The following list of persons, whose names have been previously removed from the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11(b), have been reinstated in view of the required fee and information they furnished to the Office of Enrollment and Discipline.

Bailey, Gary C., Eastman Chemical Co., P.O. Box 511, Kingsport, Tenn., 37662

Bell, Craig M., Dann, Dorfman, Herrell & Skillman, 1601 Market St., Suite 720, Philadelphia, Pa., 19102

Corum, William A., 1103 Russell Dr., Highland Beach, Fla., 33487

Dent, Boyce C., The Ward Machinery Co., Law Dept., 10615 Beaver Dam Rd., Cockeysville, Md., 21030

Donofrio, John, Allied Signal Inc., P.O. Box 2245, 101 Columbia Rd., Morristown, N.J., 07962

Flynn, Brian J., Nanometrics Inc., P.O. Box 61704, Sunnyvale, Calif., 94088

Kasell, Brian W., Brobeck, Phleger & Harrison, 550 S. Hope St., Ste. 2100, Los Angeles, Calif., 90071

Langley, Jr., Harry Dale, 600 Congress Ave., 1600 One American Ctr., Austin, Tex., 78701

Madden, Thomas J., Venable, Baetjer, Howard & Civiletti, Suite 1000, 1200 New York Ave., N.W., Washington, D.C., 20005

Moran, John F., Walter Reed Army Institute of Research, Attn: MCMR-UWZ-I, Washington, D.C., 20307

Motsenbocker, Marvin A., Foley & Lardner, 3000 K St., N.W., Suite 500, Washington, D.C., 20007

Mueller, Robert W., Greenblum & Bernstein, P.L.C., 1941 Roland Clarke Pl., Reston, Va., 20191

Murray, Kittie A., 24 Main St., P.O. Box 668, Henniker, N.H., 03242

Pawl, Marc C., 2 Delaware Rd., Whitehouse Station, N.J., 08889

Phillips, Stephen J., Intergraph Corp., Mailstop HQ 034, Huntsville, Ala., 35894

Ray, Patricia L., 990 Bendemeer Rd., 1233, Singapore

Rueggegger, Martin C., Piedmont Natural Gas Co., Inc., 1915 Rexford Rd., Charlotte, N.C., 28211

Sabath, Robert P., Oblon, Spivak, McClelland, Maier & Neustadt, P.C., 224 Airport Pkway., Ste. 300, San Jose, Calif., 95110

Sachar, Surinder, Oblon, Spivak, McClelland, Maier & Neustadt, P.C., 1755 Jefferson Davis Hwy., Ste. 400, Arlington, Va., 22202

Sadler, Clifford Lincoln, 50 Moorland Dr., Grosse Pointe Shore, Mich., 48236

Sako, Katie E., Microsoft Corp., One Microsoft Way, Redmond, Wash., 98052

Sander, Dorothy L., 12 George St., #4B, Charleston, S.C., 29401

Sarnoff, Joshua D., Moran, Lewis & Bockius, 1800 M St., N.W., Washington, D.C., 20036

Saxe, Jon Sheldon, Saxe Associates, 435 Old Oak Ct., Los Altos, Calif., 94022

Schaefer, Robert K., 7735 Falstaff Rd., McLean, Va., 22102

Schaukowitch, Carl, Oliff & Berridge, 700 S. Washington St., Alexandria, Va., 22314

Schechter, Minda R., Graham & James, 801 S. Figueroa St., 14th Flr. Los Angeles, Calif., 90017

Schnurr, Mary J., American National Can Co., 8770 W. Bryn Mawr Ave., Chicago, Ill., 60631

Schroeder, Larry C., Texas Instruments, Inc., P.O. Box 655474, M.S. 241, Dallas, Tex., 75265

Schwartz, Herbert Frederick, Fish & Neave, 1251 Avenue of the Americas, New York, N.Y., 10020

Seaburg, Jean, Olds & Associates, P.A., 10800 Lyndale Ave., S., Minneapolis, Minn., 55420

Seas, Jr., Robert John, Sughrue, Mion, Zinn, Mac Peak & Seas, 2100 Pennsylvania Ave., N.W., Ste. 800, Washington, D.C., 20037

Seeley, Mark V., Intel Corp., Legal Dept., 2200 Mission College Blvd., M.S. S.C., 4-202, Santa Clara, Calif., 95052

Sender, Stuart D., Kaye, Scholer, Fierman, Hays & Handler, L.L.P. 425 Park Ave., New York, N.Y., 10022

Serbin, David J., Leydig Voigt & Mayer, 700 Thirteenth St., N.W., Ste. 300, Washington, D.C., 20005

Shea, II, Timothy J., Perkins, Smith & Cohen, One Beacon St., Boston, Mass., 02108

Shehata, Magdy W., 6071 Joust Lane, Alexandria, Va., 22315

Sherrill, Michael S., 4756 Banning Ave., Ste. 200, White Bear Lake, Minn., 55110

Siegel, Jaime A., Kenyon & Kenyon, One Broadway, New York, N.Y., 10004

Sipio, William J., Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y., 10036

Sirota, Neil P., Brumbaugh, Graves, Donohue & Raymond, 30 Rockefeller Plaza, New York, N.Y., 10112

Smith, Charles B., 401 East Linton Blvd., Apt. 518, Delray Beach, Fla., 33483

Smith, Norman R., B.F. Goodrich, 9911 Brecksville Rd., Cleveland, Ohio, 44141

Smith, Pei-Pei C., Logos Research Systems, Inc., 715 S.E. Fidalgo Ave., Oak Harbor, Wash., 98277

Sprunt, Diane H., 3385 S.W. Vista Dr., Portland, Oreg., 97225

Stahl, Scott B., Texas Instruments, Inc., P.O. Box 655474, M.S. 219, Dallas Tex., 75265

Stanback, Willard A., 409 N. Pine St., Langhorne, Pa., 19047

Stanford, Gary R., Stanford & Bennett, L.L.P., 221 W. 6th St., Ste. 1550, Austin, Tex., 78701

Starkweather, Michael W., CTS Corp., 905 W. Blvd., N., Elkhart, Ind., 46514

Steinmetz, Jr., Richard C., Allen-Bradley Co., Inc., 1201 S. Second St., Milwaukee, Wisc., 53204

Stephens, Lawrence K., Cooley Goodward, L.L.P., Five Palo Alto Sq., 3000 El Camino Real, Palo Alto, Calif., 94306

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Stevens, Lauren L., Affymax Research Institute, 4001 Miranda Ave., Palo Alto, Calif., 94304

Stewart, Richard C., Champion International Corp., One Champion Plaza, Stamford, Conn., 06921

Stroup, Sharon E., 1411 Grady Randall Ct., Mc Lean, Va., 22101

Strozier, Robert W., Gilbreth & Strozier, P.O. Box 61305, Houston, Tex., 77208

Strunck, Stephen S., IBM Corp., P.O. Box 218, M.S. 39-277, Yorktown Heights, N.Y., 10598

Suter, David L., The Procter & Gamble Co., Miami Valley Labs., P.O. Box 538707, Cincinnati, Ohio, 45253

Swiatek, Mafia S., Flehr Hohbach Test Albritton & Herbert, 850 Hansen Way, Suite 200, Palo Alto, Calif., 94304

Weisz, Paul B., Foxdale Village, A1,500 E. Marylyn Ave., State College, Pa., 16801

Wright, Stephen R., Andrews & Kurth, L.L.P., 4200 Texas Commerce Tower, Houston, Tex., 77002

December 6, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment & Discipline

Notice of Policy Change - Change in Time Requirement For Diligently Monitoring Trademark Applications and Registrations

The timeliness standard for due diligence in trademark cases is extended to twelve months.

On October 27, 1992, the Assistant Commissioner for Trademarks announced that applicants and registrants had a duty to monitor the status of their pending trademark application and registration matters every six months. 1143 TMOG 73 (October 27, 1992); *see* Trademark Manual of Examining Procedure, § 413 (2d ed. May 1993). In response to public comment, and effective immediately, the Office is extending the timeliness standard for due diligence to twelve months.

The PTO generally processes applications, responses and other papers in the order in which they are received in the Office. In addition, examining attorneys are required to act on new cases within 14 days of receipt and amended cases within 21 days of receipt. Accordingly, applicants and registrants can expect to receive notice concerning their filings within predictable time periods. However, delays in processing certain types of trademark filings have led the Office to re-evaluate its policy regarding due diligence in trademark cases.

Since it is reasonable to expect some notice from the PTO about a pending matter within twelve months of the filing or receipt of any documents, a party who has not received the expected written action or telephone call from the PTO within that time frame is considered on notice that the filing may have become lost. The party awaiting notification has the burden of inquiring as to the cause of the delay. In order to be considered diligent in the monitoring of applications or registrations, parties expecting notification from the PTO should inquire within twelve months. **Waiting until the end of the twelve-month period is not recommended**. Parties should inquire as soon as they suspect that a problem exists.

If nothing has been received from the PTO within a twelve-month period, the party awaiting notification has the burden of inquiring as to the status. Should the status inquiry reveal that the relevant document is lost, or some other problem exists, a petition to the Commissioner, or other required action, should be filed within 60 days. 37 CFR § 2.146(d). Failure to act diligently and to follow up with the appropriate action may result in denial of the requested relief.

Whenever possible, status inquiries should be made by calling the Trademark Status Line at (703) 305-8747. The Status Line provides the current status and status date of all active federal trademark applications and registrations, and is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday. Status Line information is limited to Status Code items, e.g., whether or not an Office action has been mailed.

Although written status inquiries are discouraged, they may be appropriate when a party has difficulty interpreting the Status Line information. In lieu of written status inquiries, clarification and additional information regarding a file may be obtained by contacting the Trademark Assistance Center at (703) 308-9000.

For further information regarding this Notice, please contact Nancy Ornelko, Administrator for Petitions, Office of the Assistant Commissioner for Trademarks, at (703) 308-8910, ext. 39.

December 9, 1996 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

Department of Commerce
Patent and Trademark Office

37 CFR Part 1
[Docket No. 961030301-6301-01]
RIN 0651-AA55

Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Correcting amendment.
Summary: This document contains a further correction to the final regulations which were published Friday, October 22, 1993 (58 FR 54494). The regulations related to the changes in signature and filing requirements for correspondence filed in the Patent and Trademark Office. The correction re-inserts part of a rule (37 CFR 1.741) that was inadvertently deleted when the rule was amended.
Effective Date: December 3, 1996.
For Information Contact: Karin Tyson by telephone at (703) 305-9285; by mail marked to her attention and addressed to the Assistant Commissioner for Patents, Box COMMENTS - PATENTS, Washington, D.C. 20231; or by fax marked to her attention at (703) 308-6916.

Supplementary Information:
Background

The final regulation that is the subject of this correction was revised to change "Certificate of Mailing" to "Certificate of Mailing or Transmission" in 37 CFR 1.741(a) as published at 58 FR 54494 (October 22, 1993), corrected at 58 FR 64154 (December 6, 1993), and in the Official Gazette of the Patent and Trademark Office at 1156 Off. Gaz. Pat. Office 61 (November 16, 1993), corrected at 1157 Off. Gaz. Pat. Office 87 (December 28, 1993).

Need for Correction

As published, the final regulation inadvertently deleted the last sentence of the first paragraph of paragraph (a) of Rule 741 and paragraphs (a)(1) — (a)(6).

Paperwork Reduction Act Statement

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

OMB has approved the collection of the information required by this rule under OMB # 0651-0020.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Freedom of Information, inventions and patents, Reporting and record keeping requirements.

PART 1—RULES OF PRACTICE IN PATENT CASES

Accordingly, 37 CFR Part 1 is corrected by making the following correcting amendment:

1. The authority citation for 37 CFR part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In § 1.741, paragraph (a) is revised to read as follows:

§ 1.741 Filing date of application.

(a) The filing date of an application for extension of a patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing or Transmission" procedures of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10. A complete application shall include:

(1) An identification of the approved product;

(2) An identification of each Federal statute under which regulatory review occurred;

(3) An identification of the patent for which an extension is being sought;

(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services or the Secretary of Agriculture to determine the length of the regulatory review period; and

(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

November 26, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Erratum

In the Notice of Certificate of Correction appearing at 1191 O.G. 3, delete all reference to Patent No. B1-4,974,979 of November 15, 1996, since no Certificate of Correction was granted.

Certificate of Correction
For Week of December 31, 1996

D. 370,910	5,286,741	5,403,908	5,450,056
4,451,745	5,286,743	5,404,473	5,450,445
4,816,017	5,293,685	5,406,605	5,452,344
4,846,806	5,311,601	5,420,583	5,452,703
4,945,045	5,316,300	5,427,930	5,453,304
4,983,383	5,316,487	5,429,056	5,453,356
5,074,991	5,335,865	5,429,787	5,458,089
5,136,502	5,344,712	5,430,602	5,458,639
5,165,449	5,358,891	5,430,674	5,459,470
5,171,534	5,360,820	5,434,093	5,460,952
5,184,147	5,379,415	5,435,990	5,460,969
5,195,049	5,384,367	5,436,576	5,461,445
5,241,334	5,386,181	5,438,248	5,462,576
5,248,909	5,388,298	5,438,370	5,463,271
5,258,943	5,389,818	5,438,546	5,464,239
5,262,007	5,390,718	5,438,746	5,464,264
5,272,735	5,391,135	5,439,647	5,465,891
5,273,208	5,392,437	5,442,300	5,472,869
5,278,995	5,398,789	5,443,279	5,473,552
5,280,510	5,399,010	5,446,348	5,473,756
5,474,765	5,517,136	5,534,956	5,550,144
5,475,456	5,517,388	5,535,431	5,550,220
5,476,663	5,517,452	5,535,493	5,550,696
5,477,150	5,517,530	5,535,577	5,550,865
5,477,262	5,518,180	5,535,849	5,550,930
5,477,979	5,518,373	5,536,323	5,550,975
5,478,329	5,518,516	5,536,449	5,551,211
5,480,030	5,518,964	5,536,709	5,552,008
5,481,686	5,519,517	5,537,517	5,552,256
5,481,725	5,519,777	5,537,598	5,552,627
5,483,102	5,520,245	5,537,882	5,552,834
5,483,777	5,520,882	5,538,236	5,553,231
5,486,751	5,520,980	5,538,878	5,553,314
5,487,289	5,521,027	5,539,081	5,553,375
5,488,446	5,521,288	5,539,308	5,553,660
5,488,709	5,521,386	5,539,524	5,553,689
5,489,326	5,521,766	5,539,526	5,553,793
5,489,884	5,522,046	5,539,553	5,553,835
5,489,949	5,522,995	5,539,555	5,554,035
5,490,022	5,523,049	5,539,683	5,554,368
5,490,109	5,523,054	5,540,945	5,554,479
5,493,377	5,523,283	5,541,228	5,555,143
5,493,514	5,523,291	5,541,400	5,556,441
5,493,683	5,523,678	5,541,829	5,556,855
5,497,039	5,523,888	5,542,351	5,557,012
5,497,620	5,524,180	5,542,445	5,557,178
5,499,356	5,524,219	5,543,490	5,557,625
5,500,842	5,524,729	5,544,343	5,557,700
5,501,417	5,526,242	5,543,886	5,558,092
5,502,441	5,526,272	5,545,030	5,558,463
5,503,115	5,526,437	5,545,087	5,558,667
5,503,441	5,526,881	5,545,222	5,559,131
5,503,963	5,527,300	5,545,736	5,560,028
5,504,839	5,528,280	5,545,997	5,560,131
5,505,227	5,528,281	5,546,141	5,560,941
5,506,923	5,528,715	5,546,213	5,561,002
5,507,143	5,528,914	5,546,364	5,561,408
5,508,060	5,529,352	5,546,373	5,561,705
5,508,250	5,529,406	5,546,389	5,561,978
5,508,252	5,529,776	5,546,513	5,562,022
5,508,281	5,530,135	5,546,672	5,562,167
5,508,418	5,530,262	5,546,770	5,562,232
5,508,648	5,530,462	5,546,929	5,562,439
5,509,913	5,531,783	5,547,779	5,562,742
5,510,504	5,532,397	5,547,961	5,563,029
5,510,818	5,532,861	5,548,026	5,564,203
5,511,514	5,532,990	5,548,091	5,564,244
5,512,893	5,533,301	5,548,254	5,564,409
5,513,007	5,533,407	5,548,370	5,564,465
5,513,518	5,533,417	5,548,372	5,564,856
5,514,304	5,533,499	5,548,505	5,564,961
5,514,712	5,533,591	5,548,730	5,564,992
5,515,361	5,534,373	5,548,736	5,567,832
5,515,719	5,534,464	5,549,843	5,568,142
5,516,600	5,534,473	5,549,960	5,571,366
5,516,865	5,534,525	5,550,130	

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Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

November 4-8, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-5	OPP	91,722	Warner-Lambert Co. v. Richwood Pharmaceutical Co., Inc.	2(d)	Opposition Sustained	"ACCUPRIL" [coronary preparations]	"ACUPRIN" [low dosage aspirin]		No
11-7	EX	74/503,251	Stewart Electronics Corp.	2(d)	Refusal Affirmed		"STEWART ELECTRONICS" [professional electronic audio products, namely, power amplifiers, mixers, digital-to-analog converters, power supplies, speaker connectors and impedance matching and single polarity matching electronic interface box, etc.]	"STEWART" [radios, tape recorders, and tape players]	No
11-8	EX EX	74/482,238 74/482,242	Internet Services Corp.	2(e)(1)	Refusal Reversed (in both cases)		"INTERACTIVE DISTRIBUTION" [pre-recorded audio and audio-video tapes and CDs, books and magazines, etc.—all featuring sales, training, educational, and motivational information and advice for entrepreneurs and businessmen; conducting seminars, etc. in the field of business operation, motivation, etc.; wholesale sales and distribution services in connection with the applicant's goods]		No
11-8	EX	74/352,450	Collegeville Flag & Mfg. Co.	2(d)	Refusal Affirmed		"ACADEMY" [cloth flags]	"ACADEMY TENT AND CANVAS" [textile banners and pennants]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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	New York Public Library (The Research Libraries)	(212) 592-7000
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/19/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/26/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/03/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/01/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	01/15/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	01/15/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	05/25/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	02/15/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	02/25/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	04/30/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/03/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/10/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Acting Director	308-1113	07/02/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	06/15/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/14/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/14/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/03/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).

(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).

(3) All design patents are granted for a term of 14 years from the date of the grant.

However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

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TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of December 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/22/96	10/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/13/96	07/08/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/05/96	11/12/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/03/96	08/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/03/96	06/19/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/11/96	08/23/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/27/96	10/09/96
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/26/96	07/24/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/96	08/15/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	10/04/96	—0—
Renewals (All Classes)	10/11/96	—0—
Section 12(c) Publications (All Classes)	06/10/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

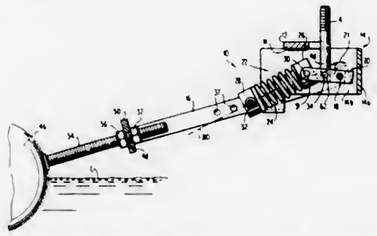
3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

DECEMBER 31, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 34,957 (3084th)
LEAK PROOF, PRELOADED, HIGH-BIASING FORCE FLOAT-OPERATED OVER-CENTER VALVE ACTUATING MECHANISM
Armand Francart, Jr., R.D. #2 Box 119Z, Rte. 896, Landenberg, Pa. 19350
Reexamination Request No. 90/004,026, Nov. 22, 1995.
Reexamination Certificate for Reissue Patent Re. 34,957, issued Aug. 25, 1992, Ser. No. 795,155, Nov. 20, 1991.
Reissued No. 1,034,957, dated May 30, 1995, Ser. No. 233,407, Apr. 26, 1994.
Int. Cl.[6] F04B *9/08*
U.S. Cl. 417—133



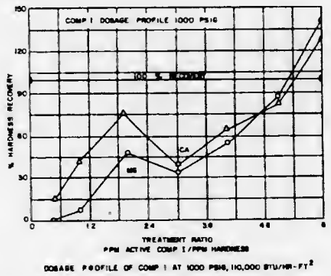
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 13, 14 and 25 are determined to be patentable as amended.

Claims 3–12 and 15–24, dependent on an amended claim, are determined to be patentable.

1. An automatic liquid pump comprising:
a sealed pressure vessel having a bottom and a top, the bottom including a liquid inlet opening and a liquid outlet opening, said top having a gas inlet adapted to be connected to a compressed gas source, a gas outlet, an inlet valve controlling the gas inlet, and an outlet valve controlling the gas outlet, a float within the housing, a snap-over toggle linkage valve actuating mechanism to alternately open and close the valves, first opening the gas outlet valve and second closing the gas inlet valve and then closing the gas outlet valve and opening the gas inlet valve, the improvement wherein said snap-over toggle valve actuating mechanism comprises a relatively fixed mainframe supported internally by said vessel, at least one compression force preload arm pivotably mounted to said fixed mainframe for pivoting about a first pivot axis A, a first toggle link pivoted at a first end to said mainframe about said first pivot axis A, a second toggle link operatively pivoted at a first end to said compression force preload arm at a point on said arm remote from said first pivot axis for pivoting about a second pivot axis C parallel to said first pivot axis A, pivot means pivoting a second end of said first toggle link to a second end of said second toggle link for pivoting about a third axis B, coupling means for operatively coupling said float to said [compressive] *commpression* force preload arm at a point remote from said first axis A, and said second toggle link comprising compressible and expandable means for constantly applying a compressive force on said pivot connection between said first and second toggle links such that, upon pivoting of said at least one [compressive] *compression* force preload arm by rise and fall of liquid within said vessel about said first pivot axis A toward a position of longitudinal alignment with the longitudinal axis of [the at least one compression force preload arm] *said first toggle link*, an increasing compressive force is applied to said first toggle link to maintain said first toggle link stationary in one of two oblique, over-center positions with respect to a center line extending parallel to the longitudinal axis of said at least one compression force preload arm, and said second toggle link pivots about said axis B and said compressible and expandable means axially compresses until said first and second links become longitudinally aligned, and move across the center line [Y] , *and wherein said compressible and expandable means comprises a stiff compression coil spring having opposite ends, being formed of relatively large diameter wire, of short axial length, having coil turns of large diameter relative to the length of the coil spring, and said compression coil spring being unrestrained intermediate of said opposite ends and having a large spring constant, thereby providing a large biasing force*, whereupon, both toggle links instantly snap over into oppositely oblique over-center positions and said second toggle link compressible and [expansible] *expandable* means expands to dissipate the energy of compression.

B2 4,457,847 (3085th)
CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS
Walter F. Lorenc, Harvey; John G. Kelly, Woodridge, both of Ill., and Frederick S. Mandel, Baton Rouge, La., assignors to Nalco Chemical Company
Reexamination Request Nos. 90/001,942, Feb. 20, 1990 and 90/003,157, Aug. 3, 1993.
Reexamination Certificate for Patent 4,457,847, issued Jul. 3, 1984, Ser. No. 382,567, May 28, 1982.
Continuation-in-part of Ser. No. 318,665, Nov. 5, 1981, abandoned.
Int. Cl.[6] C02F *5/10*
U.S. Cl. 210—698



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–14 are cancelled.

[1. A method of treating hardness including calcium and magnesium present in boiler waters which are in contact with heat transfer surfaces exposed to boiler operating conditions to prevent formation of scale including calcium and magnesium on, and to remove previously formed scale from, these heat transfer surfaces, which comprises treating the boiler waters with a non-corrosive treatment composition substantially free of potentially corrosive chelants, and containing a water-soluble sequestrant anionic vinyl polymer containing at least 30% by weight of carboxylate functionality, said polymer being chosen from the group consisting of:
(a) homopolymers of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;

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(b) copolymers of one member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid, with at least one other member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;

(c) copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with acrylamide;

(d) copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with vinyl sulfonate; and

(e) hydrolyzed polyacrylamide;

said polymer further having a molecular weight within the range of 500–50,000 and a chelation value of at least 200, which chelation value represents the milligrams of calcium or magnesium expressed in terms of calcium carbonate complexed by one gram of a sequestrant, and with the amount of said sequestrant anionic vinyl polymer being based upon the amount of hardness present, and being within the range of 3–30 ppm of polymer per ppm of hardness present in such boiler waters, whereby the hardness in the boiler waters is sequestered by the water-soluble sequestrant anionic vinyl polymer, thereby preventing formation of scale on, and removing previously formed scale from, the heat transfer surfaces exposed to boiler waters.]

B1 4,625,557 (3086th)

ACOUSTICAL IMAGING SYSTEM

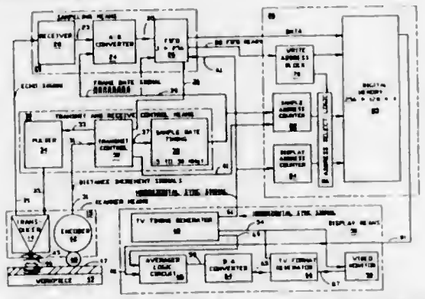
Jerry Rutherford, Anaheim, Calif., assignor to Lora E. Rutherford, Lake Barrington, Ill.

Reexamination Request No. 90/004,046, Nov. 30, 1995.

Reexamination Certificate for Patent 4,625,557, issued Dec. 2, 1986, Ser. No. 703,315, Feb. 20, 1985.

Int. Cl.[6] G01N *29/06*

U.S. Cl. 73—635



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** to **19** is confirmed.

1. An imaging system for non-destructively imaging the cross-section of a workpiece, said cross-section being taken substantially orthogonal to the surface of said workpiece along an operator selected course on said surface, said image system comprising:

a scanner means for providing a series of acoustical pulses in response to a corresponding series of acoustical drive signals; for receiving reflected acoustical waves from said workpiece surface and providing an echo signal corresponding to the received acoustical waves for each acoustical pulse; and for providing a series of distance increment signals at substantially equal incremental distances in response to motion of said scanner means on said workpiece surface along said operator selected course;

a transmit and receive control means responsive to each distance increment signal for providing an acoustical drive signal and a column clock signal set comprising a predetermined number of consecutive spaced column clock signals, the duration of said column clock signal set characterizing an echo interval as the time required for said acoustical waves resulting from each acoustical pulse to move through said workpiece and return to said scanner means;

sampling means responsive to said column clock signal set for converting each said echo signal into a corresponding column series of digital values, each value characterizing the amplitude of said echo signal at time corresponding to a respective column clock signal within said echo interval;

storage means for storing each column series of digital values as successive column arrays to form an image array of digital values, each digital value having a corresponding column and row address, and for reading and outputting said image array of digital values as display data in display compatible format;

display means for forming an image from said display data formed from said image array of digital values, each digital value controlling the gray scale level of a pixel on said image, said image characterizing the cross-section of said workpiece.

B1 4,642,317 (3087th)

PROCESS FOR FEEDING RUMINANT ANIMALS AND COMPOSITION FOR USE THEREIN

Donald L. Palmquist, Wooster, and Thomas C. Jenkins, Apple Creek, both of Ohio, assignors to Ohio Agricultural Research and Development Center, Wooster, Ohio

Reexamination Request Nos. 90/003,412, Apr. 29, 1994 and 90/003,537, Aug. 23, 1994 and 90/003,579, Sep. 19, 1994.

Reexamination Certificate for Patent 4,642,317, issued Feb. 10, 1987, Ser. No. 567,617, Jan. 3, 1984.

Continuation of Ser. No. 274145, Jun. 16, 1981, abandoned.

Int. Cl.[6] A61K *31/20*

U.S. Cl. 514—558

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–15** are cancelled.

[1. A process for supplying a fatty acid containing at least 10 carbon atoms to ruminant animals which comprises feeding to said animals the calcium salt of said fatty acid in an amount equal to at least about 1% of the dry matter content of said animals' feed.]

B1 4,713,147 (3088th)

EXTENDED NIP PRESS WITH DISPLACEABLE CENTRE OF GRAVITY FOR THE SUPPORTING FORCE

Esko Saarinen, Tampere, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

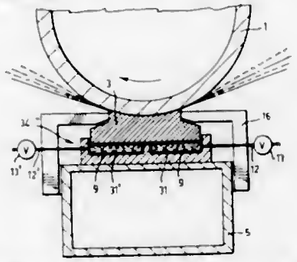
Reexamination Request No. 90/004,158, Mar. 10, 1996.

Reexamination Certificate for Patent 4,713,147, issued Dec. 15, 1987, Ser. No. 489,830, Apr. 29, 1983.

Claims priority, application Finland, May 5, 1982, 821584

Int. Cl.[6] D21F *3/06*

U.S. Cl. 162—358.3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** is confirmed.

1. An extended nip press for a paper machine for removing water from a wet paper, cardboard or similar fibrous or porous web, said press comprising

a rotating press roll,

at least one stationary loading shoe parallel to the axis of said press roll and pivotable around an axis parallel to said axis, said loading shoe together with said press roll forming an extended press zone,

at least one dewatering felt passing between said press roll and a band for passing the web to be dewatered through said press zone, and

a support means located between said loading shoe and its supporting frame for applying a supporting force on said loading shoe, said supporting force pressing said loading shoe against said press roll, said support means being provided with transfer elements for displacing the centre of gravity of the supporting force acting on said loading shoe in the direction of movement of the web to be dewatered.

B3 4,803,445 (3089th)

VARIABLE FREQUENCY OSCILLATOR

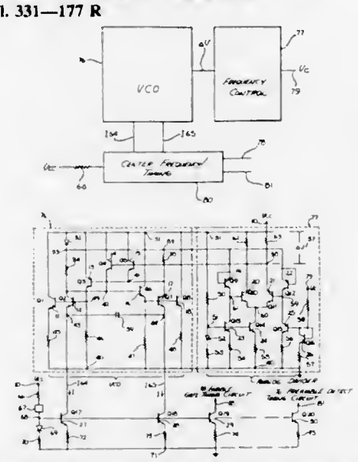
Richard G. Yamasaki, Torrance, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Reexamination Request No. 90/003,909, Aug. 4, 1995.

Reexamination Certificate for Patent 4,803,445, issued Feb. 7, 1989, Ser. No. 41,767, Apr. 22, 1987.

Int. Cl.[6] H03K *3/281*

U.S. Cl. 331—177 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **6** are determined to be patentable as amended.

Claims **2–5** and **7–9**, dependent on an amended claim, are determined to be patentable.

1. A circuit for providing a variable frequency oscillator (VFO) comprising:

oscillating means having a center frequency and outputting a first clock signal;

first control means coupled to a control voltage and said oscillating means for controlling said first clock signal;

second control means coupled to said oscillating means for controlling said center frequency and outputting a plurality of [second clock] *timing* signals external to said oscillating means, wherein [at least one of] said plurality of [clock] *timing* signals [is] *are* coupled to a *plurality of* timing [circuit] *circuits*, said second control means independent of said first control means.

B1 5,367,884 (3090th)

GENERATOR-ABSORBER-HEAT EXCHANGE HEAT TRANSFER APPARATUS AND METHOD AND USE THEREOF IN A HEAT PUMP

Benjamin A. Phillips, Benton Harbor; Thomas S. Zawacki, St. Joseph, both of Mich., and Joseph Marsala, Glen Ellyn, Ill., assignors to Phillips Engineering Co., St. Joseph, Mich.

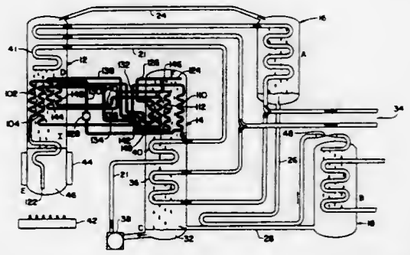
Reexamination Request No. 90/003,736, Feb. 22, 1995.

Reexamination Certificate for Patent 5,367,884, issued Nov. 29, 1994, Ser. No. 76,759, Jun. 15, 1993.

Continuation-in-part of Ser. No. 793,644, Nov. 18, 1991, Pat. No. 5,271,235, which is a continuation-in-part of Ser. No. 668,198, Mar. 12, 1991, abandoned.

Int. Cl.[6] F25B *15/00*

U.S. Cl. 62—101



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **10–12** are cancelled.

Claims **1**, **15**, **16**, **21**, **26**, **30**, **41**, **46**, **55–59**, **70**, **74**, **79**, **88** and **89** are determined to be patentable as amended.

Claims **2–9** **13–14**, **17–20**, **22–25**, **27–29**, **31–40**, **42–45**, **47–54**, **60–69**, **71–73**, **75–78** and **80–87** dependent on an amended claim, are determined to be patentable.

New claims **90–93** are added and determined to be patentable.

1. [In a] *A* generator-absorber heat exchange apparatus [including] *comprising:* a generator and an absorber, the absorber having an interior pressure lower than the pressure of the generator interior *and having an absorber heat exchange region*, and each having high and low temperature regions at opposite ends establishing respective temperature ranges and a heat transfer region, the temperature ranges defining the respective heat transfer regions overlapping; a fluid flow pathway circulating a weak liquor from the high temperature region of the generator and a rich liquor from the low temperature region of the absorber to and through the high temperature, heat transfer and low temperature regions of the generator and the absorber, [the improvement comprising:] *with the rich liquor being circulated from the low temperature region of the absorber through the absorber heat exchange region of the absorber;*

and a heat exchange circuit receiving a portion of the liquor from the fluid flow pathway and circulating said portion of the liquor between said heat transfer regions transferring heat from the absorber to the generator.

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B1 5,383,454 (3091st)

SYSTEM FOR INDICATING THE POSITION OF A SURGICAL PROBE WITHIN A HEAD ON AN IMAGE OF THE HEAD

Richard D. Bucholz, St. Louis, Mo., assignor to Sofamor Danek Group, Inc., Memphis, Tenn.

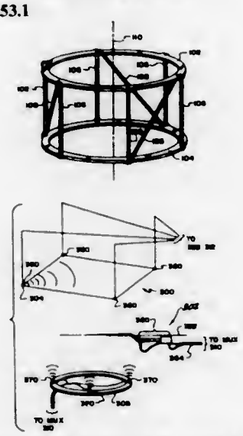
Reexamination Request No. 90/003,899, Jul. 24, 1995.

Reexamination Certificate for Patent 5,383,454, issued Jan. 24, 1995, Ser. No. 909,097, Jul. 2, 1992.

Continuation of Ser. No. 600,753, Oct. 19, 1990, abandoned.

Int. Cl.[6] A61B *5/103*

U.S. Cl. 128—653.1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

3. The system of claim **2** wherein the second means comprises:

a base adapted to be mounted on the body in a position having a fixed relationship with the reference points means of the body; and

means for measuring the position of the base with respect to the reference means.

B1 5,387,211 (3092nd)

MULTI-HEAD LASER ASSEMBLY

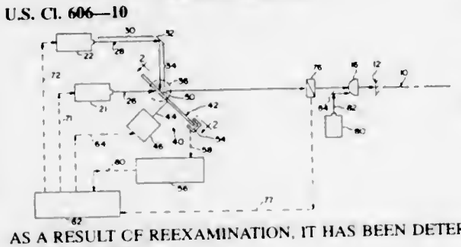
Vahid Saadatmanesh, Irvine, and Marvin P. Loeb, Huntington Beach, both of Calif., assignors to Trimedyne, Inc., Irvine, Calif.

Reexamination Request No. 90/004,023, Oct. 30, 1995.

Reexamination Certificate for Patent 5,387,211, issued Feb. 7, 1995, Ser. No. 28,839, Mar. 10, 1993.

Int. Cl.[6] A61N *3/00*

U.S. Cl. 606—10



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–19** is confirmed.

1. A laser device for co-axial positioning of plural laser beams along a single axis, which device comprises:

at least two laser oscillators for producing a laser beam by each oscillator;

rotary reflector means positioned for intercepting at least one of said produced laser beams and directing the intercepted laser beam separately from, but along a single axis defined by, the other laser beam;

alignment means for aligning the respective laser beams of each said oscillator at an angle along paths which intersect at a region;

said reflector means includes a reflecting member rotation means for rotating said reflecting member through said path intersection region; and

said device includes control means for operating one of said oscillators to emit a pulse of said one laser beam only as said reflecting member rotates through said path intersection region so as to reflect said one beam pulse along said single axis and for operating another of said oscillators to emit a pulse of said other laser beam only when said reflecting member has rotated beyond said path intersection region so that said other beam pulse passes unobstructed along said single axis.

B1 5,426,344 (3093rd)

ELECTRONIC BALLASTS

Siew E. Wong, Mount Ousley, and Thien S. Yang, Connells Point, both of Australia, assignors to Ultralite International Pty. Limited, New South Wales, Australia

Reexamination Request No. 90/004,106, Dec. 21, 1995.

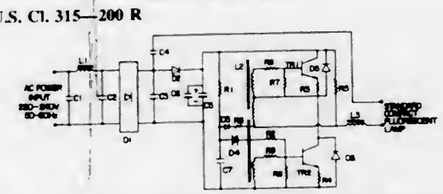
Reexamination Certificate for Patent 5,426,344, issued Jun. 20, 1995, Ser. No. 192,993, Feb. 7, 1994.

Continuation of Ser. No. 875,761, Apr. 29, 1992, abandoned.

Claims priority, application Australia, Aug. 31, 1990, PK2084

Int. Cl.[6] H05B *41/14*

U.S. Cl. 315—200 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3** are cancelled.

1. In a ballast circuit for a fluorescent lamp in which the ballast circuit has a rectifier bridge (D1), a mylar capacitor (C3) across the rectifier bridge and a smoothing capacitance in parallel with the mylar capacitor, the improvement comprising:

an additional diode (D2) have an electrode connected to the junction of the mylar capacitor and the rectifier bridge and the other electrode connected to the smoothing capacitance, said additional diode being a high speed switching type polarized so that during half cycles of the supply voltage when the supply voltage is less than the voltage on the smoothing capacitance, said additional diode blocks current from flowing from the smoothing capacitance to thereby improve the power factor and reduce hamonic distortion of the ballast circuit.

B1 5,462,535 (3094th)

SYRINGE SYSTEM

Frits F. Bonnichsen, Lynge, and Peter N. Jørgensen, Broenshoej, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

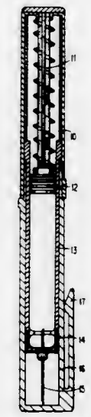
Reexamination Request No. 90/004,192, Mar. 25, 1996.

Reexamination Certificate for Patent 5,462,535, issued Oct. 31, 1995, Ser. No. 323,401, Oct. 14, 1994.

Continuation-in-part of Ser. No. 167,831, Dec. 16, 1993, abandoned.

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—272



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. An insulin injection system comprising a pen shaped syringe comprising a cartridge with insulin and an injection needle, wherein the needle is a **G30** needle and the cartridge contains an insulin type which may freely flow through the **G30** needle.

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REISSUES

DECEMBER 31, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,410

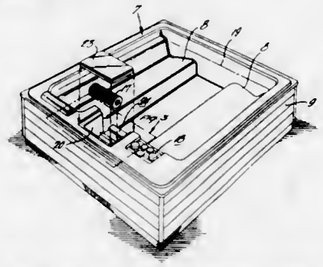
SPA WITH RECESSED FILTER CHAMBER

Carson D. Adcock, Huntingdon Valley, Pa., and Robert Lauter, Fort Wayne, Ind., assignors to W. W. Adcock, Inc., Huntingdon Valley, Pa.

Original No. 4,552,658, dated Nov. 12, 1985, Ser. No. 645,870, Aug. 31, 1994. Application for reissue Jun. 14, 1993, Ser. No. 77,346

Int. Cl.[6] A61H *33/00*

U.S. Cl. 4—541.3 **4 Claims**



1. A spa with a water recirculation system, comprising a molded shell for [the] spa water having a filter cavity integrally molded with the shell below the [water] level *of the spa water* and upwardly open for access from above the water level, the cavity being inwardly open to the interior of the shell to receive water therefrom and having a filter chamber in the lower portion thereof positioned to receive a filter in a horizontal position at a level below the water level in the shell, *said filter chamber in the lower portion of said cavity being separated from the interior of the shell by a partition*, and the filter chamber having a suction connection extended exteriorly of the shell, and a renewable filter positioned horizontally in said chamber to receive water flowing into the filter chamber from the interior of the shell and delivering [the] filtered water to said suction connection.

Re. 35,411

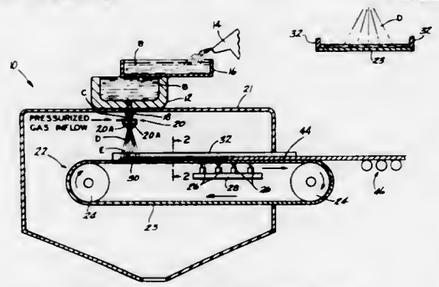
BELT CASTING OF MOLTEN METAL

Sankaranarayanan Ashok, West Haven, and Harvey P. Cheskis, North Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Original No. 5,131,451, dated Jul. 21, 1992, Ser. No. 628,074, Dec. 14, 1990. Application for reissue Jul. 20, 1994, Ser. No. 277,849

Int. Cl.[6] B22D *23/00*

U.S. Cl. 164—46 **8 Claims**



1. A method of casting metal [strip] comprising:

providing a moving substrate having edge dams thereon for the containment of the molten metal in a direction transverse to the movement of said substrate,

atomizing a stream of molten metal into highly liquid droplets,

depositing said spray of droplets; onto said moving substrate with a highly liquid content such that the deposited metal flows in a direction transverse to the direction of movement of the substrate against the edge dams, and

causing said deposited molten metal to solidify as said substrate moves the metal in a direction away from the spray being deposited.

Re. 35,412

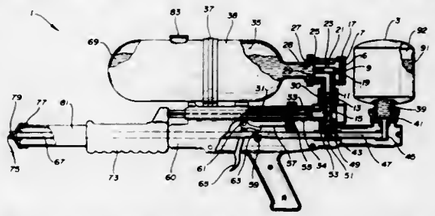
DOUBLE TANK PINCH TRIGGER PUMP WATER GUN

Lonnie G. Johnson, Smyrna, Ga., and Bruce M. D'Andrade, Whitehouse Station, N.J., assignors to Larami Limited, Mt. Laurel, N.J.

Original No. 5,150,819, dated Sep. 29, 1992, Ser. No. 841,762, Feb. 28, 1992. Continuation of Ser. No. 680,247, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 578,145, Sep. 6, 1990, Pat. No. 5,074,437. Application for reissue Aug. 26, 1994, Ser. No. 296,438

Int. Cl.[6] A63H *3/18*

U.S. Cl. 222—79 **26 Claims**



20. A toy water gun comprising a storage reservoir adapted to hold water and air, said storage reservoir having a vent which allows air to enter said water storage reservoir; a pressure tank adapted to hold water and air; first conduit means for conveying water or air from said storage reservoir to said pressure tank, said first conduit means being coupled with said storage reservoir in a position so that the orientation of water within the storage reservoir determines whether water or air is drawn from within said storage reservoir; drawing means for selectively drawing air or water or a combination of air and water from said storage reservoir and depositing the drawn air or water or combination thereof into said pressure tank through said first conduit means; second conduit means for conveying water from said pressure tank to ambience; and control means for controlling the flow of water through said second conduit means.

Re. 35,413

ELECTROSPRAY ION SOURCE WITH REDUCED NEUTRAL NOISE AND METHOD

Iain C. Mylchreest, Milpitas, Calif., and Mark E. Hail, Yardley, Pa., assignors to Finnigan Corporation, San Jose, Calif.

Original No. 5,171,990, dated Dec. 15, 1992, Ser. No. 703,471, May 17, 1991. Application for reissue Mar. 30, 1994, Ser. No. 220,963

Int. Cl.[6] B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—282 **2 Claims**

4. A method of operating an ion source, said ion source including a low pressure chamber having a skimmer with an orifice, and

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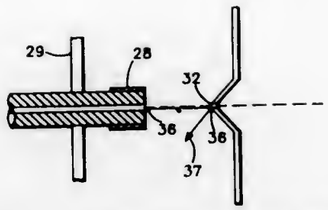


means to communicate with the low pressure chamber, said method comprising the steps of:

desolvating charged droplets in said ion source to produce a flow of ions and undesolvated droplets;

causing said flow of ions and undesolvated droplets to flow from said communicating means along an axis of said communicating means into said low pressure chamber; and

offsetting said axis of said communicating means from said orifice of said skimmer so that said ions flow through said orifice while said undesolvated droplets impinge upon said skimmer.

Re. 35,414

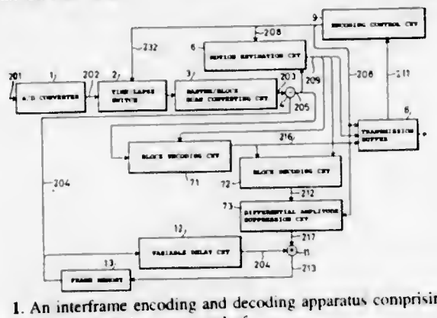
PICTURE CODING AND DECODING APPARATUS USING VECTOR QUANTIZATION

Tokumichi Murakami; Kohtaro Asai; Koh Kamizawa; Masami Nishida, all of Kamakura; Eizo Yamazaki, Tokyo; Atsushi Itoh, Yokohama, and Naoto Kinjoh, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 5,010,401, dated Apr. 23, 1991, Ser. No. 340,009, Aug. 11, 1988. Application for reissue Jan. 8, 1992, Ser. No. 818,277

Int. Cl.[6] **H04N** *7/12;7/18*

U.S. Cl. 348—416 **12 Claims**



1. An interframe encoding and decoding apparatus comprising:

an encoding section composed of

a frame memory for storing one frame of a video signal series;

a raster/block scan converting circuit for dividing an input signal series into blocks of k samples each (k: a positive integer) to form input block data;

a subtractor for obtaining interframe differential block data by subtracting block data stored in said frame memory from said input block data, corresponding to the same position as that of the input block data in the period of at least one frame before;

a motion detecting circuit for comparing an absolute value sum of amplitudes of samples within the block of said interframe differential block data with a motion detection threshold value, and detecting motion in units of block and determining motion information of movement existing when said sum is greater than said threshold value and no movement when said sum is less than said threshold value;

a block encoding circuit for encoding the interframe differential block data of movement existing as valid blocks into encoded block data;

a transmission data buffer for converting the motion information and the encoded block data into a suitable code word and storing it for a predetermined and fixed time, and then transmitting it together with the motion detection threshold value to the transmission line at a predetermined and fixed speed and calculating the storage amount of the encoded data in the predetermined and fixed time;

an encoding control circuit for determining said motion detection threshold value and an input time lapse according to changes of said storage amount of encoded data;

a block decoding circuit for decoding said encoded block data to reproduce the interframe differential block data of movement existing, and discriminating blocks of no movement as invalid blocks and making sample values of an interframe differential decoded block data corresponding to an invalid block all zero;

a differential amplitude suppressing circuit for suppressing the amplitude value of the decoded interframe differential block data obtained in said block decoding circuit non-linearly based on said motion detection threshold value; and

an adder for adding the suppressed decoded interframe differential block data to said block data in the frame memory and obtaining reproduction block data, and replacing block data in said frame memory with reproduction block data of the same position in a frame as that of the block data in the frame memory; and

a decoding section composed of

a reception data buffer memory for receiving the encoded data supplied through the transmission line and storing it for a predetermined and fixed time, and then decoding the motion information and the encoded block data from the code word and separating and outputting the motion detection threshold value;

a block decoding circuit for decoding and reproducing the interframe differential block data of movement existing from said encoded block data from said reception buffer memory, and discriminating the block of no movement as an invalid block and making sample values of the reproduced interframe differential block data corresponding to an invalid block all zero;

a differential amplitude suppressing circuit for suppressing the amplitude value of the decoded interframe differential block data obtained in said block decoding circuit non-linearly based on the motion detection threshold value;

a frame memory for storing one frame of a video signal series in blocks;

an adder for adding the suppressed interframe differential decode block data to the block data from said frame memory and obtaining reproduction block data, and writing the reproduction block data at the same position as that of the block data within said frame memory; and a block/raster scan converting circuit for converting the reproduction block data from said adder into a signal series in raster form.

Re. 35,415

CAMERA HAVING AN AUTOMATICALLY OPERATED BUILT-IN STROBE

Satoshi Takami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

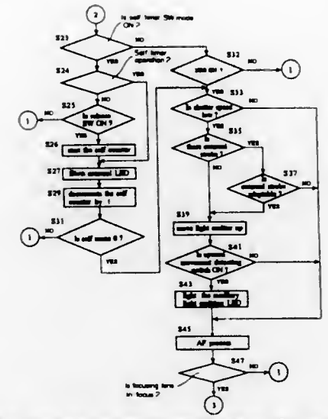
Original No. 5,122,829, dated Jun. 16, 1992, Ser. No. 592,986, Oct. 4, 1990. Continuation of Ser. No. 202,204, Feb. 25, 1994, abandoned. Application for reissue Aug. 7, 1995, Ser. No. 511,720

Claims priority, application Japan, Oct. 6, 1989, 1-261810; Oct. 19, 1989, 1-272365

Int. Cl.[6] **G03B** *15/05*

U.S. Cl. 396—165 **26 Claims**

21. A strobe incorporated comera having a strobe light emitter which emits strobe light, a light emitter driving mechanism which moves said strobe light emitter between a retracted position in which said strobe light emitter is retracted in a camera body and an operative position in which said strobe light emitter emits said



strobe light, and an exposure control means for performing a predetermined exposure when a switch is turned ON, said camera comprising:

means for judging whether said strobe light emitter should be used;

means for controlling said light emitter driving mechanism to move said strobe light emitter to said operative position when said strobe judging means determines that said strobe light emitter should be used and said switch is turned ON;

a self timer photographing mode;

an automatic focusing device; and

an automatic focus control means for controlling said automatic focusing device.

Re. 35,416

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR PRODUCTION THEREOF

Katsumi Suzuki, and Mitsutaka Nishikawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Original No. 5,128,784, dated Jul. 7, 1992, Ser. No. 498,583, Mar. 23, 1990. Application for reissue Jul. 6, 1994, Ser. No. 271,400

Claims priority, application Japan, Mar. 23, 1989, 1-71117; Apr. 12, 1989, 1-92458; Apr. 14, 1989, 1-95634; Apr. 20, 1989, 1-100685; Apr. 24, 1989, 1-103719; Apr. 25, 1989, 1-105043; Apr. 25, 1989, 1-105044; Apr. 25, 1989, 1-105045; Apr. 25, 1989, 1-105046; Apr. 26, 1989, 1-106428; May 9, 1989, 1-115572; Nov. 8, 1989, 1-290525

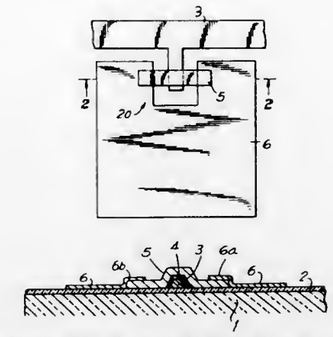
Int. Cl.[6] **G02F** *1/13*

U.S. Cl. 349—41 **49 Claims**

25. A matrix liquid crystal display device, comprising:

(a) a first substrate and a plurality of first electrodes supported by the first substrate;

(b) a second substrate with a plurality of second electrodes supported thereby spaced apart from the first substrate to form a space therebetween, wherein the first electrodes oppose the second electrodes and a plurality of picture element electrodes are arranged in a matrix-like pattern on one of said substrates at the intersections of the first and second electrodes;



(c) a plurality of two-terminal switching elements, supported by the same substrate as the picture element electrodes, each of the two-terminal switching elements being coupled to one of the picture element electrodes for electrically connecting each of the picture element electrodes to one of the first or second electrodes; and

(d) a liquid crystal material located in the space between the first and second substrates;

wherein the two-terminal switching elements are constructed with a non-linear resistor layer disposed between two conductive portions and the capacitance C_{CF} of the second substrate, the capacitance C_{LC} of the liquid crystal material, and the capacitance C_{MIM} of the two-terminal switching elements is governed by the relationship:

$$C_{CF}\times C_{LC}/(C_{CF}+C_{LC})\times C_{MIM}>2.$$

Re. 35,417

OLIGOSACCHARIDE SEQUENCING

Thomas W. Rademacher; Mark R. Wormald; Raj. B. Parekh; Christopher J. Edge, and Raymond A. Dwek, all of Oxford, United Kingdom, assignors to Oxford GlycoSystems Ltd., Abingdon, United Kingdom

Original No. 5,100,778, dated Mar. 31, 1992, Ser. No. 416,633, Oct. 3, 1989. Application for reissue Mar. 24, 1994, Ser. No. 217,117

Int. Cl.[6] **C12Q** *1/25*

U.S. Cl. 435—18 **14 Claims**

11. A method of sequencing oligosaccharides comprising:

A. placing an identifying label on the reducing terminal residue of the oligosaccharide to be sequenced,

B. dividing said oligosaccharide into a plurality of separate portions of known integer amounts,

C. reacting each said portion with a different reagent mix for a predetermined period of time or to a predetermined end point and in amounts and proportions sufficient to thereby provide a series of reaction mixtures of cleaved reaction products,

D. analyzing products from said reaction mixtures to measure the molar proportions of the reaction products, and

E. reconstructing or identifying the starting oligosaccharide from the molar prevalence of said reaction products.

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PLANT PATENTS

GRANTED DECEMBER 31, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,769

HYBRID TEA ROSE PLANT NAMED 'MALJOANNA'

Mark G. Maltagliati, 1698 Manor Dr., San Pablo, Calif. 94801

Filed Jan. 19, 1996, Ser. No. 582,351

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described.

9,770

STRAWBERRY PLANT NAMED 'ARENA'

Jose M. A. Lopez, Tudela, Spain, assignor to Plantas de Navarra, S.A., Navarra, Spain

Filed Aug. 9, 1995, Ser. No. 513,006

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct variety of strawberry plant, substantially as shown and described.

9,771

ROBINIA PLANT NAMED 'LACE LADY'

Peter Cunningham, Auckland, New Zealand, assignor to Trustees of the Peter Cunningham Family Trust, and Trustees of the Sharyn Cunningham Family Trust, both of Auckland, New Zealand

Filed Apr. 25, 1995, Ser. No. 428,703

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—51.1 **1 Claim**

1. A new and distinct variety of *Robinia pseudoacacia* plant, substantially as illustrated and described, which exhibits:

(a) a bushy shrub shrub growth habit,

(b) the formation of branches having a generally short zigzag internodal growth configuration,

(c) the propensity to form spines on at least some branches, and

(d) the formation of mature leaves that commonly possess severely curled leaflets.

9,772

CHRYSANTHEMUM PLANT NAMED 'DREAMY TRACY'

Leon Glicenstein, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 18, 1995, Ser. No. 516,564

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named Dreamy Tracy, as described and illustrated.

9,773

GERANIUM PLANT NAMED 'FISMEGA'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 518,894

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. It is claimed a new and distinct cultivar of geranium plant named Fismega as illustrated and described.

9,774

GERANIUM PLANT NAMED 'FISBOOGY'

Angelika Utecht, Montabaur, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Aug. 29, 1995, Ser. No. 520,715

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new distinct cultivar of geranium plant named Fisboogy, as illustrated and described.

9,775

AGLAONEMA PLANT NAMED DEBORAH

J. Glenn Barnes, Apopka, and Marcus S. Lambert, Zolfo Springs, both of Fla., assignors to Sunshine Foliage World, Zolfo Springs, Fla.

Filed Sep. 1, 1995, Ser. No. 523,490

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Aglaonema plant named Deborah, as illustrated and described.

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PATENTS

GRANTED December 31, 1996

ERRATA

For CLASS	See PATENT NO.
131–259	5,588,448
242–378	5,588,626
242–599	5,588,627
242–607	5,588,628
473–456	5,588,645
473–426	5,588,646
473–470	5,588,647
473–451	5,588,648
463–018	5,588,649
473–206	5,588,651
473–168	5,588,652
473–218	5,588,653
473–429	5,588,655
508–168	5,589,095
510–514	5,589,099
264–004	5,589,370
427–250	5,589,425
417–063	5,589,633
396–548	5,589,900
396–012	5,589,901
396–003	5,589,902
396–428	5,589,903
396–055	5,589,904
396–431	5,589,905
396–505	5,589,906
396–287	5,589,907
396–051	5,589,908
396–096	5,589,909
396–106	5,589,910
396–080	5,589,911
396–055	5,589,912
399–114	5,589,913
399–060	5,589,914
399–120	5,589,915
399–286	5,589,916
399–274	5,589,917
399–114	5,589,918
399–262	5,589,919

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ERRATA–CONTINUED

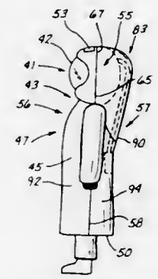
For CLASS	See PATENT NO.
399–145	5,589,920
399–297	5,589,921
399–315	5,589,922
399–078	5,589,923
399–350	5,589,924
399–323	5,589,925
399–302	5,589,926
386–121	5,589,943
386–084	5,589,944
386–083	5,589,945
386–042	5,589,946
386–096	5,589,947
349–016	5,589,958
349–088	5,589,959
349–076	5,589,960
349–041	5,589,961
349–046	5,589,962
349–119	5,589,963
349–160	5,589,964
349–165	5,589,965
349–174	5,589,966
395–204	5,590,037
395–241	5,590,038
395–759	5,590,039

PATENTS

GRANTED DECEMBER 31, 1996

GENERAL AND MECHANICAL

5,588,153
SURGICAL GOWN
Roger G. Ignon, Palos Verdes Estates, and Ronald E Thomas, Jr., Alta Loma, both of Calif., assignors to Stackhouse, Inc., Riverside, Calif.
Filed Apr. 28, 1995, Ser. No. 440,495
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—457 **10 Claims**



1. A surgical gown adapted to be operatively disposed to substantially cover a surgeon wearing a ventilator including a wait mounted power unit, a head mounted manifold structure, and at least one tube extending therebetween, the gown having a front and a back and further comprising:

a head section sized and configured to receive the head of the surgeon;

a waist section disposed beneath the head section when the gown is operatively disposed on the surgeon, the wait section being sized and configured to receive the waist of the surgeon;

a shoulder section disposed between the head section and the waist section when the gown is operatively disposed on the surgeon, the shoulder section being sized and configured to receive the shoulders of the surgeon;

a ventilator section disposed between the head section and the waist section when the gown is operatively disposed on the surgeon, the ventilator section forming a tube channel extending along the back of the gown sized and configured to receive the at least one tube of the ventilator; wherein

The ventilator section forms an enlargement on the back of the gown which facilitates movement of the head of the surgeon and the at least one tube of the ventilator without substantially restricting the movement of the head section of the gown.

5,588,154
UNIFORM WITH OPTIONALLY CONCEALED/ DEPLOYED VISUAL PANELS FOR DISPLAY ABOUT A 360 DEGREE PERIPHERY
Stephen Blauer, Lexington, Mass., and Mark Mordechai, Hampton, N.H., assignors to Blauer Manufacturing Co. Inc., Boston, Mass.
Filed Oct. 7, 1994, Ser. No. 319,876
Int. Cl.[6] A41B *1/00*
U.S. Cl. 2—69 **35 Claims**

1. A uniform for a human wearer, said uniform comprising matching shirt and trouser constructions:

(a) said shirt construction including a back body section, right and left front body sections, pairs of arms and sleeves, a collar, and a selectively secured, selectively free yoke that extends across said wearer's shoulders from arm to arm and over said shoulders and about said collar between said back body section and said front body sections;

(b) said front body sections having breast pockets, said breast pockets having tops that are open and overlapped by free edges of said yoke;

(c) an inverted pocket at said back body section, with a bottom opening defined between said back body section and a free edge of said yoke;

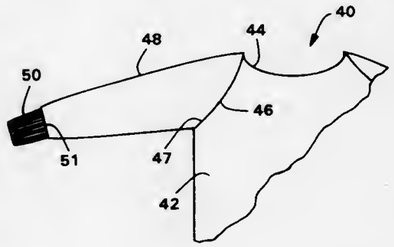
(d) shirt display panels detachably secured within said breast pockets and said inverted pocket, said shirt display panels being adapted to be confined within said breast pockets and said inverted pocket out of sight or extended outwardly from said breast pockets and said inverted pocket for viewing;

(e) said trouser construction including a riser, a pair of legs, slant side pockets in said riser and side patch pockets under said slant side pockets at the sides of said legs;

(f) trouser display panels detachably secured within said side patch pockets, said trouser display panels being adapted to be confined within said side patch pockets out of sight or extended outwardly from said side patch pockets for viewing; and

(g) whereby, when all of said display panels of said breast pockets, said inverted pocket and said side patch pockets are deployed, the summation of said panels are available for viewing substantially throughout a 360-degree periphery about said wearer.

5,588,155
LIQUID IMPERVIOUS SURGICAL GOWN CUFF AND METHOD FOR MAKING THE SAME
Jerry W. Baker, Roswell, and Timothy W. Reader, Suwanee, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Mar. 31, 1995, Ser. No. 414,989
Int. Cl.[6] A41B *7/00*
U.S. Cl. 2—123 **8 Claims**



1. A surgical gown comprising:

a sleeve and a cuff secured to the sleeve; wherein the cuff is formed from an elastic necked-stretched laminate; and

wherein the elastic necked-stretched laminate includes a neckable material layer joined to an elastic aqueous liquid impervious layer.

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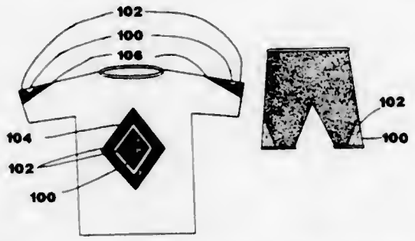
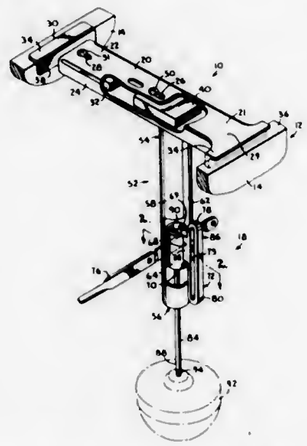
5,588,156
ARTICLE OF CLOTHING HAVING HIGH VISIBILITY
George S. Panton, Jr., Melbourne Beach, Fla., assignor to Diamond Safety Gear, Inc., Indialantic, Fla.
Filed Jun. 7, 1995, Ser. No. 470,584
Int. Cl.[6] A41D *13/00;27/08*
U.S. Cl. 2—243.1 **19 Claims**



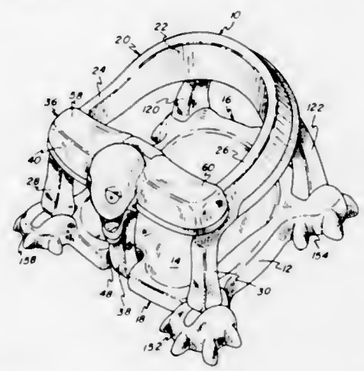
16. An article of clothing, comprising at least one first diamond-shaped retroreflective material and at least one second diamond-shaped retroreflective material, which first diamond-shaped retroreflective material encloses a first colored accent area and which diamond-shaped retroreflective material is enclosed, in whole or in part, by a second colored accent area and which second diamond-shaped retroreflective material is enclosed, in whole or in part, by a third colored accent area, in which said first and second colored accent areas are diamond-shaped and said third colored accent area is triangular.

5,588,157
TOILET VALVE SEAT ACTUATOR ASSEMBLY
Ralph L. Mayfield, 1233 W. Lydia, Wichita, Kans. 67213
Filed Mar. 10, 1995, Ser. No. 402,183
Int. Cl.[6] E03D *1/35*
U.S. Cl. 4—397 **11 Claims**



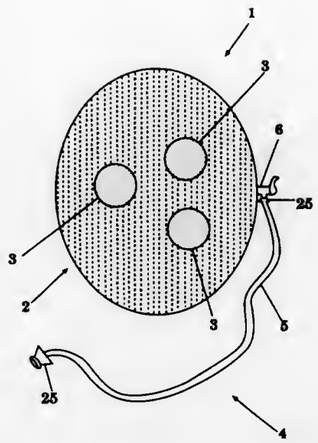
1. A toilet valve seat actuator assembly for use in connection with a toilet tank, said assembly being adapted for engagement with a trip handle mechanism and operable to lift a tank ball from a valve seat upon activation by said trip handle, thereby initiating a flush sequence, and to guide said tank ball back onto said valve seat upon completion of said sequence, said assembly comprising:
a support bracket adapted for mounting within said tank at a position generally overlying said valve seat;
a sleeve having an upper end, a lower end and a generally cylindrical wall, said sleeve being mounted to said support bracket at said upper end and disposed to extend substantially vertically downwardly over said valve seat, said sleeve defining a longitudinal canal in said wall, said canal terminating above said lower end;
a tube telescoped within said sleeve and adapted for movement along the axis of said sleeve, said tube defining a lateral hole generally alignable with said canal;
an arm defining a vertical slot adapted to engage said trip handle mechanism exteriorly of said sleeve and having a tongue securing said arm to said tube, said tongue having its greatest dimension in the vertical plane for slidable movement within said canal, said tongue also being fixably received through said hole in said tube and extending substantially across the same;
a bore defined in said tongue, the axis of said bore being generally concentric with the axis of said tube; and
a lift rod having an upper end and a lower end slidably received within said bore, said upper end including a stop having a horizontal dimension greater that the diameter of said bore, thereby prohibiting movement of said stop therethrough, and said lower end including means for attachment to said tank ball.

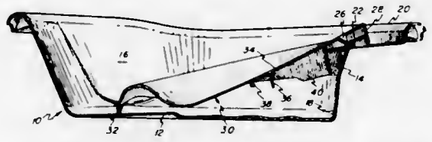
5,588,158
BATH RING
Keith L. Poulson, Westminster; Robert M. Parker, Aurora, both of Colo.; Jon R. Rossman, Chelmsford, and Bryan R. Hotaling, Arlington, both of Mass., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 7, 1995, Ser. No. 554,729
Int. Cl.[6] A47K *3/024*
U.S. Cl. 4—572.1 **23 Claims**



1. A bath ring, comprising:
(a) a base portion;
(b) a ring portion having a back portion for supporting the back of a person seated on said base portion;
(c) attachment means connecting said ring portion to said base portion;
(d) restraining means extending upwardly from a front edge of said base portion, said restraining means further comprising:
(1) a first portion being pivotable about said base portion;
(2) a second portion having a pair of distal ends; and
(3) a lock mechanism associated with said first and second portions which is adapted to engage with and disengage from a pair of slots located in an inwardly facing surface of said ring portion; and
said lock mechanism further comprising:
(i) a first element including a pair of oppositely extending arm members and a central member from which each arm member extends, said central member having the ability to be compressed so that said arm members may be brought closer together; and
(ii) a second element extending substantially along said first portion;
wherein said first and second elements are located in adjoining relation so that said central member of said first element is compressed as said second element is moved upwardly.

5,588,159
INFANT BATHTUB WITH MULTIPLE-POSITION INFANT SUPPORT
Keith L. Poulson, Westminster; Robert M. Parker, Aurora; Jeffrey T. Samson, Boulder, and Harry B. Taylor, Lafayette, all of Colo., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 13, 1995, Ser. No. 559,167
Int. Cl.[6] A47K *3/024*
U.S. Cl. 4—572.1 **10 Claims**



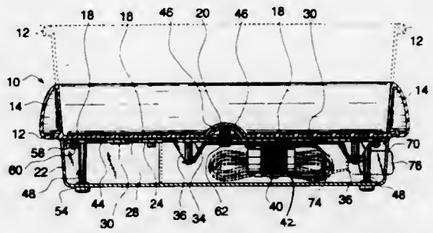


1. In an infant bathtub for comfortably supporting the head, back and bottom of an infant in any one of multiple inclined positions, comprising:
a tub having a generally horizontal bottom wall, a head end wall portion extending upwardly from said bottom wall and having an upper inside surface, and a generally vertical wall extending upwardly from and encompassing the remainder of said bottom wall for retaining bath water between said bottom wall and the upwardly extending walls;
a removable, elongated infant-supporting insert having an upper surface contoured to comfortably support the bottom, back and head of an infant, and an underside surface opposite said upper surface; and,
interengagable means on the underside surface of said insert and integrally formed on the upper inside surface of said head end wall for firmly supporting and maintaining said insert in at least two different angles of inclination in said tub, said interengagable means including;
i. a first gripping portion at the upper inside surface of said head end wall; and,
ii. a pair of second gripping portions on the underside of said insert, said pair of second gripping portions being spaced longitudinally along said insert and each one of said pair being independently engageable with said first gripping portion whereby only one of said pair of second gripping portions is active to support and maintain said insert in cooperation with said first gripping portion in a given one of said different angles of insert inclination.

5,588,160
TOTAL BODY BRUSH SHOWER
Timothy G. Nichols, Rte. 4, Box 250, Galax, Va. 24333
Filed Sep. 5, 1995, Ser. No. 523,552
Int. Cl.[6] A47K *7/02*
U.S. Cl. 4—606 **1 Claim**

1. A shower brush assembly comprising:
a front piece having resilient bristles on an outer surface thereof and at least one opening therethrough;
a tubing fixture comprising at least one shower nozzle with water carrying tubing attached thereto;
a back piece having a plurality of suction cups formed on a rear surface thereof, said suction cups being sufficient to attach said assembly to a wall of a shower, said back piece rear surface further having a plurality of hand attachment straps formed thereon wherein said assembly may alternatively be attached to a person's hand;
said front piece having means on a surface opposite said outer surface for attachment of said tubing;
said front piece being attached to said back piece in a manner enclosing said tubing with said at least one shower nozzle extending at least partially through said at least one opening;
means for attaching said tubing to a water source wherein water may flow from said source through said tubing and be expelled from said at least one nozzle to shower a user.

5,588,161
FOOT BATH
George Barradas, 15 River View Ct., Greenwich, Conn. 06831
Filed Nov. 3, 1995, Ser. No. 552,785
Int. Cl.[6] A47K *3/022*
U.S. Cl. 4—662 **9 Claims**



1. A portable foot bath adapted for connection to a power source, comprising a tub having a floor and a base platform connected to said floor for supporting the tub, said platform having a base surrounded by generally vertical side walls, a heater platform supported on said base platform and provided with a heater element on a top surface thereof, a motor having a vibratory coil for vibrating the floor of said tub, said motor located within said base platform and suspended from a bottom surface of said heater platform, said tub adapted for receiving the user's feet and positioned above said heater element, a thin metal heat transmitting panel positioned between said heater element and the floor of said tub engaging the latter as well as said heater element so that heat is

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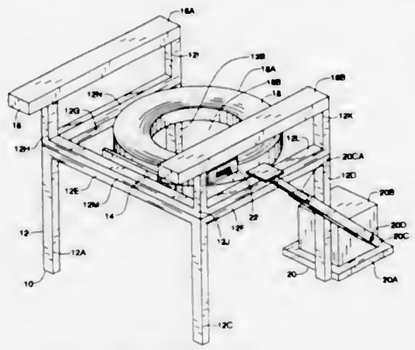
radiated throughout the floor of the tub, and spaced rounded projections rising from the floor of the tub for vibratory massage of the feet.

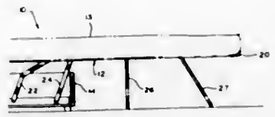
5,588,162
POWER ACTUATED TOILET SEAT
Gary C. Robinson, P.O. Box 24, Cooter, Mo. 63839
Filed Nov. 17, 1994, Ser. No. 341,375
Int. Cl.[6] A47K *13/10;17/00*
U.S. Cl. 4—667 **2 Claims**



1. A toilet seat assembly comprising:
a frame including a plurality of legs rigidly connected to each other by a plurality of cross members, said cross members including an upper cross bar abutting and located above a lower cross bar;
b. a hinge mounted on the upper cross bar;
c. a toilet seat connected at a forward end thereof to the hinge, thereby permitting pivotal movement of the toilet seat about the upper cross bar;
d. an actuator assembly connected to the, toilet seat for raising and lowering the toilet seat, the actuator assembly configured for electrical operation; and
e. a switch mounted to the frame and in electrical communication with the actuator assembly to permit a user to selectively raise and lower the toilet seat in response to manipulation of the switch, whereby the toilet seat assembly functions to assist such a user in moving between a standing and a sitting position about a toilet.

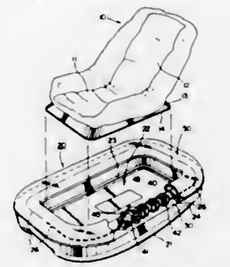
5,588,163
SUPPORT DECK FOR MATTRESS OR SEAT
John E. Miller, 1016 Monroe St., Tupelo, Miss. 38801
Continuation-in-part of Ser. No. 66,993, May 25, 1993, which is a continuation-in-part of Ser. No. 588,351, Sep. 26, 1990, Pat. No. 5,231,709. This application May 19, 1995, Ser. No. 444,685
Int. Cl.[6] A47C *17/02*
U.S. Cl. 5—13 **15 Claims**

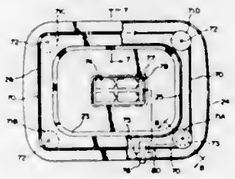
12. A support assembly for seating or bedding comprising a plurality of support members extending in the same general direction to form a support, said support members having adjacent ends connected to each other for movement relative to each other, means preventing movement of said ends in one direction and allowing movement of said ends in a direction opposite said one direction, said support members being provided in a plurality of rows laterally positioned relative to each other, and wherein each support member has on one end a generally T-shaped portion and an end portion opposite said one end including a slot dimensioned



to receive during assembly the T-shaped portion of an adjacent support member, said support member being pivotable about an axis extending through the T-shaped portion such that said support members are pivotable relative to each other in one direction.

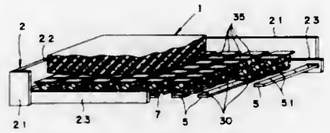
5,588,164
INFANT SEAT ROCKER AND AMUSEMENT UNIT
Genevieve C. Proulx, 1475 Waltham Street, Gloucester, Ontario, Canada
Filed Aug. 22, 1995, Ser. No. 517,848
Int. Cl.[6] A47C *3/02;* **A47D** *9/02;13/10;* **A63H** *18/08*
U.S. Cl. 5—109 **11 Claims**

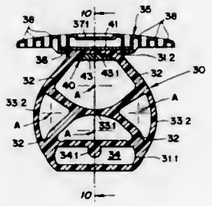




1. A base unit for supporting an infant carrier seat comprising a housing having a curved bottom surface for rocking on a generally flat support surface, said housing having an upper central portion on which an infant carrier seat is removably mountable, an endless closed loop pathway circumscribing said central portion, a weight, and power means to move said weight along said path in a closed loop at a selected rate of speed to cause said base unit to rock.

5,588,165
CUSHIONING ASSEMBLY HAVING PLASTIC SPRINGS FOR SUPPORTING A PAD
Heinrich Fromme, Schloss Holte-Stukenbrock, Germany, assignor to Senne Lizenz & Produkte GmbH, Schloss Holte-Stukenbrock, Germany
Filed Nov. 10, 1994, Ser. No. 338,804
Claims priority, application Germany, Nov. 10, 1993, 9317114 U; Mar. 10, 1994, 9404021 U; Jul. 30, 1994, 9412330 U
Int. Cl.[6] A47C *27/06;31/12*
U.S. Cl. 5—247 **16 Claims**

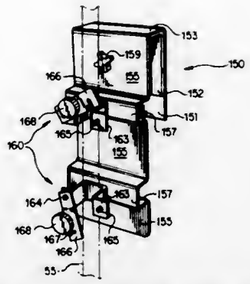




1. A cushioning assembly, comprising:
a foundation; and
a plurality of springs mounted on said foundation, said springs arranged in substantially parallel rows, each row including two springs arranged adjacent respective ends of the row and a plurality of springs disposed between said two springs, whereby said springs of all of said rows together define a support area adapted to support a pad, each spring comprising:
an elastically compressible portion formed of plastic and comprising a hollow body forming at least one through-chamber defining an axis,
a mounting portion disposed at a bottom of said elastically compressible portion and including structure for connection with said foundation, and
a pad-supporting plate disposed at a top of said elastically compressible portion and adapted for supporting a pad;
said axes of said springs lying in a common plane oriented parallel to said pad-supporting plates and perpendicular to a loading applied to the spring assembly by a user,
wherein said foundation comprises a plurality of parallel slats, said springs being mounted along said slats, said springs mounted on each slat defining one of said rows, said mounting portion forming a slat chamber extending completely through said spring and through which a slat extends.

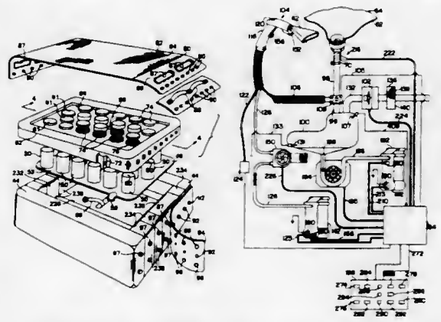
5,588,166
MEDICAL ATTACHMENT DEVICE
John Burnett, 1009 #B Constitution Ave. NE., Washington, D.C. 20002
Filed Jan. 4, 1995, Ser. No. 368,439
Int. Cl.[6] F16L *3/08*
U.S. Cl. 5—503.1 **5 Claims**

1. An attachment device for attaching a wheeled auxiliary apparatus, which comprises an upright pole, to a patient transport vehicle, which comprises a horizontally disposed part, for synchronized movement of said apparatus and said vehicle, comprising:
A) a holding member comprising an inner flat side, a top side, and an outer side, said inner and outer sides being spaced apart by an insertion distance, wherein said outer side comprises a pair of stiffening ridges that are spaced apart in



parallel and across said outer side, at least one of said inner and outer sides having a width greater than said distance and having at least one threadedly and perpendicularly attached screw for pressing said horizontally disposed part against the other of said sides, whereby said part is thereby rigidly held by said member; and
B) a grasping member, attached to said outer side, for grasping said upright pole, said grasping member comprising a pair of pole clamps which are mounted upon said pair of ridges, each said pole clamp comprising:
1) a hat-shaped member having a central base which is rigidly attached to one said ridge, a pair of flat outer leaves on each side of said base and outwardly spaced therefrom, a pivot lug mounted on one said leaf, and a holding lug mounted on the other said leaf, and
2) a swivel plate mounted on said pivot lug at one end thereof and having a slot in the other end thereof for engaging said holding lug.

5,588,167
APPARATUS AND METHOD FOR MANAGING WASTE FROM PATIENT CARE MAINTENANCE AND TREATMENT
Demetrios A. Pahno, Mt. Pleasant; James R. Stolpmann, Charleston, and James M. C. Thomas, Mt. Pleasant, all of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.
Continuation of Ser. No. 74,860, Jun. 11, 1993, Pat. No. 5,438,721, which is a continuation-in-part of Ser. No. 792,216, Nov. 13, 1991, Pat. No. 5,269,030. This application May 11, 1995, Ser. No. 438,714
Int. Cl.[6] A61G *7/02*
U.S. Cl. 5—606 **12 Claims**



1. An apparatus for managing waste arising from at least one of the care, maintenance, and treatment of a patient, the apparatus comprising:
a) means for supporting at least a portion of the patient's body, said supporting means including a flexible member inflatable

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with pressurized air, said flexible member including a plurality of flexible surfaces forming in combination a discontinuous surface for receiving said portion of the patient's body;

b) a means for catching waste, said waste catching means being carried by said supporting means;

c) a vacuum blower disposed for sucking the wastes from said catching means; and

d) a holding reservoir disposed in communication with said catching means and said vacuum blower to receive the waste sucked from said catching means by said vacuum blower.

5,588,168

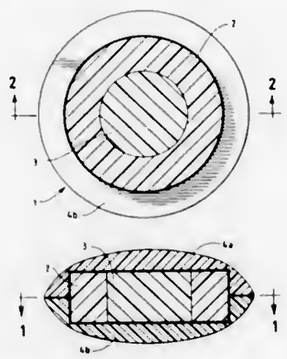
CONTOURED SYMMETRICAL DIFFERENTIAL-ELASTICITY NECK PILLOW

Thomas Byrne, 10055 S. Maplewood, Chicago, Ill. 60655, and John O'Connor, 10504 S. Claremont, Chicago, Ill. 60643

Filed Jan. 23, 1996, Ser. No. 599,482

Int. Cl.[6] A47G *9/00*

U.S. Cl. 5—636 **4 Claims**



1. A contoured neck pillow comprising:

a round central pad comprised of resilient foam having a compression of approximately seven pounds and a diameter of approximately eight inches;

an annular ring comprised of resilient foam having a compression of from fifteen to twenty pounds, and having an outer diameter of approximately sixteen inches; and

two foam sections enclosing the central pad and annular ring, and permanently attached thereto; whereby the pillow provides differential elasticity that is not altered by inverting or rotating the pillow.

5,588,169

TOOL ASSEMBLY FOR BICYCLE

Louis Chuang, 11th Floor, - 1 No. 367, Gong Yi Road, Taichung, Taiwan

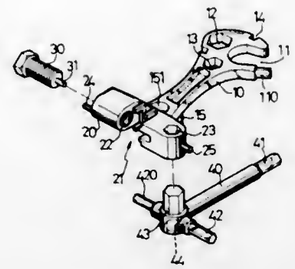
Filed Apr. 24, 1995, Ser. No. 427,437

Int. Cl.[6] B25F *1/02*

U.S. Cl. 7—138 **7 Claims**

1. A tool assembly for a bicycle comprising:

a body (**10**) including a first end and a second end, the first end having at least one engaging hole (**12, 13**) defined therein and at least one engaging opening (**11, 14**) defined in a peripheral portion thereof, the second end having a socket (**15**) formed on a first side thereof and including a block (**20**) secured thereto, the block (**20**) extending in a direction traverse to a longitudinal direction of the body (**10**) and including a slot (**21**) defined in a middle portion thereof for receiving a chain means having pivot shafts therein, the block further comprising a first end having a screw hole (**22**) defined therein and



extending along a longitudinal direction thereof for engaging with a bolt means (**30**), the bolt means (**30**) including an extension (**31**) for disengaging the pivot shafts from the chain means; and

a rod (**40**) including a first end having a first driving tool bit (**41**) projecting longitudinally and outwardly therefrom and a second end having a second driving tool bit (**43**) projecting outwardly in a direction perpendicular to the longitudinal direction of the rod (**40**), the second driving tool bit (**43**) including a first end with two sides which is integral with the second end of the rod, and a third driving tool bit (**42**) and a fourth driving tool bit (**420**) respectively projecting laterally and outwardly from the two sides of the second driving tool bit in a direction perpendicular to the longitudinal direction of the rod and perpendicular to a longitudinal direction of the second driving bit.

5,588,170

METHOD AND DEVICE FOR TREATING AN IN PARTICULAR TENSION-SENSITIVE TEXTILE WEB

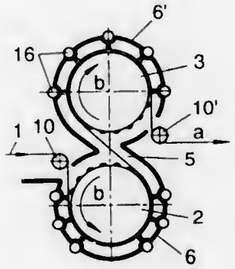
Christian Strahm, Bronschhofen, Switzerland, assignor to Solipat AG, Zug, Switzerland

Filed Jan. 20, 1995, Ser. No. 375,653

Claims priority, application Switzerland, Jan. 28, 1994, 00254/94

Int. Cl.[6] D06B *3/12*

U.S. Cl. 8—149.1 **15 Claims**



1. Method of treating a tension-sensitive textile web with a treatment medium, said method comprising steps of

moving the textile web over at least two rollers, through a narrow shaft defined by walls, said walls having at least one curved segment formed in part by a surface portion of one of said rollers, and

applying said treatment medium under pressure to the web at said curved segment.

5,588,171

DRAIN LINE CLEANING APPARATUS

James L. Hamann, Eldridge, Iowa, assignor to Pettibone Corporation, Lisle, Ill.

Filed Mar. 24, 1995, Ser. No. 410,478

Int. Cl.[6] B08B *9/00*

U.S. Cl. 15—104.12 **9 Claims**

1. A drain line cleaning apparatus comprising:

a spin head adapted to rotate about a spin head axis; said spin head defining a cylinder; said cylinder further defining an internal surface having one or more notches each having a first surface and a second surface, said first surface forming a first angle with respect to said second surface;

said first surface of said one or more notches defining an axis perpendicular to said first surface, said axis of said first surface forming a second angle with respect to said spin head axis;

a generally cylindrical insert received at least partially within said spin head;

cutting means attached to said spin head and adapted to revolve about said axis when said spin head rotates;

means for providing pressurized water to said one or more notches of said spin head, whereby said spin head rotates when said one or more notches are impacted by pressurized water;

said pressurized water providing means including at least one jet passageway defined by said insert along a radial plane of said insert, said radial plane being perpendicular to said spin head axis;

wherein said pressurized water is directed by said at least one jet passageway to said first surface of said notch; and

wherein said first surface of said one or more notches deflects said pressurized water along a path away from said spin head to generate thrust to propel said drain line cleaning apparatus.

5,588,172

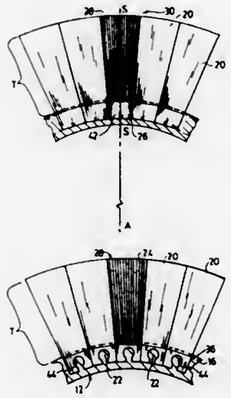
RADIAL BRUSH

Peter M. Biocca, Rochester, N.Y., assignor to Abtex Corporation, Dresden, N.Y.

Filed Jul. 11, 1994, Ser. No. 273,379

Int. Cl.[6] A46B *3/02;13/02*

U.S. Cl. 15—179 **9 Claims**



1. A radial brush for rotation about an axis, comprising:

(a) a core having a plurality of locking stations circumferentially spaced about the core; and

(b) a plurality of preformed independent brush segments, each brush segment having an inner end and a spaced apart outer end, and a plurality of fibers integrally bonded at the inner end with free ends of the fibers defining the outer end, the inner end including a locking portion for mechanically engaging a respective one of the locking stations to operably affix the brush segment to the core and each brush segment including sides terminally defined by the inner end and the outer end of the brush segment;

the locking stations, locking portions and brush segments selected so that the entire side of each brush segment contacts the entire side of an adjacent brush segment, and the fibers of each segment extending parallel to a first plane, and the brush segments affixed relative to each other and the core to dispose the first plane orthogonal to the axis.

5,588,173

WINDSHIELD WIPER SYSTEM WITH ELECTRIC MOTOR

Stefan Battlogg, Haus Nr. 26, A-6771 St. Anton i/M, Austria

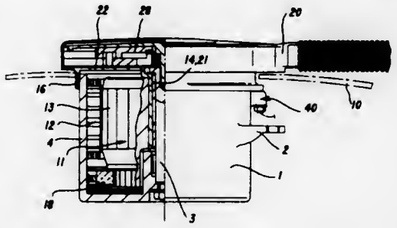
PCT No. PCT/AT93/00054, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO93/18944, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 22, 1993, Ser. No. 313,028

Claims priority, application Austria, Mar. 23, 1992, 586/92

Int. Cl.[6] B60S *1/08;1/34*

U.S. Cl. 15—250.3 **17 Claims**



1. In an automobile which includes a windshield wiper system for wiping a windshield, said system comprising:

a wiper arm pivotally supported on an automobile and drive means for pivoting said wiper arm, said drive means including a reversible electric motor stationarily mounted on the automobile and a control unit controlling said electric motor, said electric motor having a stator portion and a rotor portion;

a housing formed of a first housing part and a second housing part closing off said first housing part, said first housing part carrying said stator portion of said electric motor and being stationarily mounted on the automobile, said second housing part being drivingly connected to said rotor portion of said electric motor, being rotatable relative to said first housing part, and being non-rotatingly connected to said wiper arm.

5,588,174

DISPOSABLE HAZARDOUS MEDICAL WASTE COLLECTION SYSTEM

Geoffrey L. Godfrey, 9006 E. Camino Del Santo, Scottsdale, Ariz. 85260

Filed Aug. 21, 1995, Ser. No. 520,208

Int. Cl.[6] A47L *13/52*

U.S. Cl. 15—257.2 **5 Claims**

1. A disposable, single use collecting pan and brush comprising, in combination:

(a) a collecting pan made of recycled paper and which has leading portion, a trailing portion, opposite end portions extending between said leading and trailing portions, side walls at each end thereof which extend between said leading and trailing portions and which together cooperate with a dividing wall to define first and second holding areas located at respective top and bottom portions of the collecting pan for collecting and receiving debris therein; said trailing portion

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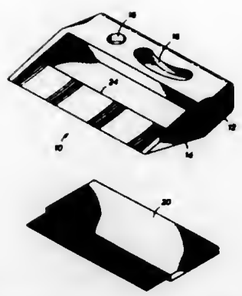


further including a gripping portion with a first elongated hole for receiving the user's fingers and a second hole for receiving the user's thumb;

(b) a brush made of recycled plastic and which comprises a substantially planar body having a plurality of bristles extending from and along a side edge thereof, said bristles being substantially coplanar with said body, said brush being adapted to fit into either one of said holding areas; and

(c) the collecting pan being easily utilized by both right and left-handed persons by selecting a respective one of said holding areas and by facing the other of said holding areas to the surface being cleaned.

5,588,175

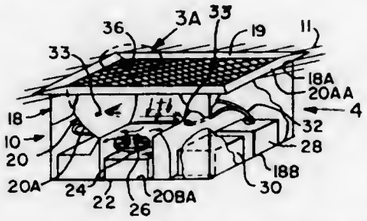
FOOT VACUUM

John Zahner, 61-32 233rd St., Bayside, N.Y. 11364

Filed May 8, 1995, Ser. No. 438,103

Int. Cl.[6] A47L *5/38*

U.S. Cl. 15—310 **5 Claims**



1. A self-contained shoe soil removing device installable in a floor of a structure and being able to internally maintain soil having a weight being removed from a shoe of a person stepping thereon, comprising:

a) a hollow and rectangular-parallelepiped-shaped housing having a rectangular-parallelepiped-shape, so that said self-contained shoe soil removing device can be easily stacked, stored, displayed, transported, and installed in, and removed out of, the floor of the structure as a result of its regular shape that is free of obstructions that could unintentionally engage the floor during installation and removal; said hollow and rectangular-parallelepiped-shaped housing being positionable in the floor of the structure and containing a single chamber; said hollow and rectangular-parallelepiped-shaped housing having an open top being flush with the floor of the structure when said hollow and rectangular-parallelepiped-shaped housing is positioned in the floor of the structure, a flat, closed, and horizontally-oriented bottom disposed below said open top of said hollow and rectangular-parallelepiped-shaped housing, and a closed and vertically-oriented side extending vertically perpendicularly upwardly from an end of said flat, closed, and horizontally-oriented bottom of said hollow and rectangular-parallelepiped-shaped housing;

b) a grill having a weight and covering said open top of said hollow and rectangular-parallelepiped-shaped housing and being contactable by the shoe of the person stepping thereon;

c) a hollow manifold contained in said hollow and rectangular-parallelepiped-shaped housing; said hollow manifold having:

i) a hollow and vertically-downwardly-tapering upper portion with a wide open top being flush with said open top of said hollow and rectangular-parallelepiped-shaped housing, a narrow open bottom being disposed below, and narrower than, said wide open top of said hollow and vertically-downwardly-tapering upper portion of said hollow manifold, and a side with at least one throughbore extending therethrough;

ii) a hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion extending horizontally-laterally-outwardly from below, and being in fluid communication with, said hollow and vertically-downwardly-tapering upper portion of said hollow manifold; said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold having an open top being coincident with said narrow open bottom of said hollow and vertically-downwardly-tapering upper portion of said hollow manifold, a first closed side being collinear with a side of said hollow and vertically-downwardly-tapering upper portion of said hollow manifold, a second closed side being parallel to said first closed side of said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold and extending outwardly from an opposite side of said hollow and vertically-downwardly-tapering upper portion of said hollow manifold, and a partially open bottom being disposed below said open top of said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold and having an open portion and a horizontally-oriented closed portion with a vertically-oriented throughbore extending vertically therethrough; and

iii) a hollow and rectangular-parallelepiped-shaped lower portion extending horizontally-laterally-outwardly from below, in the same direction as, and in fluid communication with, said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold; said hollow and rectangular-parallelepiped-shaped lower portion of said hollow manifold having a partially open top with an open portion being coincident with said open portion of said partially open bottom of said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold, a closed and horizontally-oriented bottom disposed below said open top of said hollow and rectangular-parallelepiped-shaped lower portion of said hollow manifold and resting completely on said flat, closed, and horizontally-oriented bottom of said hollow and rectangular-parallelepiped-shaped housing so as to be reinforced thereby, and a closed and vertically-oriented side extending vertically-perpendicularly-upwardly from an end of said closed and horizontally-oriented bottom of said hollow and rectangular-parallelepiped-shaped lower portion of said hollow manifold and abutting completely against said closed and vertically-oriented side of said hollow and rectangular-parallelepiped-shaped housing so as to be reinforced thereby, so that said hollow and rectangular-parallelepiped-shaped lower portion of said hollow manifold can withstand the weight of the soil being deposited and stored therein for eventual removal therefrom;

d) a motor contained in said hollow and rectangular-parallelepiped-shaped housing, external to said hollow manifold, so that the soil flowing through said hollow manifold does not contact said motor and cause damage thereto; said motor resting on said flat, closed, and horizontally-oriented bottom of said hollow and rectangular-parallelepiped-shaped housing so as to be supported thereby;

e) motor activating means for selectively starting and stopping said motor; said motor activating means contained in said hollow and rectangular-parallelepiped-shaped housing and contacting said grill and being in electrical communication with said motor;

f) a vertically oriented shaft connected to, and extending vertically upwardly from, said motor and passing vertically through said vertically-oriented throughbore in said horizontally-oriented closed portion of said partially open bottom of said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold; and

g) a horizontally-oriented turbine contained in said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold and being attached directly to said shaft for rotation therewith, so that when the person steps on said grill, said motor activating means causes said motor to start and rotate, which in turn causes said shaft to rotate, which in turn causes said horizontally-oriented turbine to horizontally rotate in said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold and create a low pressure area thereat which causes a vacuum to be created thereat that creates an air flow thereto that causes the soil from the shoe of the person stepping on the grill to be removed and directed downwardly through said hollow and vertically-downwardly-tapering upper portion of said hollow manifold to said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold where the centrifugal force created by the rotation of said horizontally-oriented turbine throws the soil horizontally outwardly through said hollow, horizontally-laterally-oriented, and parallelogram-shaped intermediate portion of said hollow manifold to said open portion of said partially open top of said hollow and rectangular- parallelepiped-shaped lower portion of said hollow manifold where gravity directs the soil downwardly in said hollow and rectangular-parallelepiped- shaped lower portion of said hollow manifold where the soil is deposited and isolated from disturbances created by the rotation of said horizontally-oriented turbine and stored for eventual removal therefrom without escaping into the atmosphere since said hollow manifold is completely contained within said hollow and rectangular-parallelepiped-shaped housing.

5,588,176

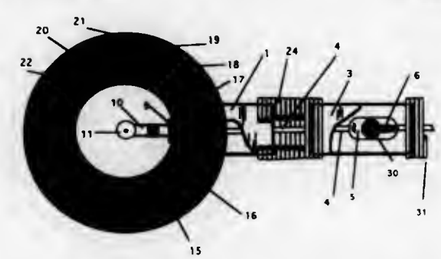
WATER RECOVERY WASH BRUSH

Thomas G. Sixsmith, 21812 Bass Lake Cir., Lake Forest, Calif. 92630, assignor to Thomas G. Sixsmith, Lake Forest, Calif.

Filed Jun. 12, 1995, Ser. No. 488,176

Int. Cl.[6] A47L *9/06*

U.S. Cl. 15—322 **5 Claims**



1. A hand operated washing device suitable for cleaning automotive or truck surfaces that captures and recovers used water or water/soap medium, said device comprising:

a) a hollow brush ring frame housing having a circular narrow opening on one end and a dependent body portion of a wider circular opening on the other end;

b) a hollow valve frame housing with identical circular openings on both inlet and outlet ends onto which is mounted a valve for regulation of fluid flow and a means for controlling said fluid flow of said valve;

c) a suction hose and integral water delivery tube secured to said narrow opening on one end, and secured on the other end to the outlet end of the valve frame housing by a water delivery tube;

d) together with means having a suitable vacuum source and a fluid delivery tube secured to the inlet side of the mounted valve on said valve frame;

e) a bristle support ring surrounding said dependent body portion of brush ring frame having vertically dependent air pervious bristles, an inside band of non-air pervious foam forming a throat to said dependent bristles, a primary layer of flexible, non-air pervious foam surrounding said bristle support ring and dependent bristles, a secondary layer of non-air pervious foam surrounding said primary foam layer, and an outside layer of non-air pervious protective foam surrounding the primary and secondary said layers;

f) a spray nozzle mounted in said brush ring housing centrally of said depending body portion which is supplied by the water delivery tube extending through said hollow brush ring frame housing.

5,588,177

BACKPACK VACUUM CLEANER

Steen M. Eriksen, Houmanns Allé 2, Copenhagen NV, Denmark

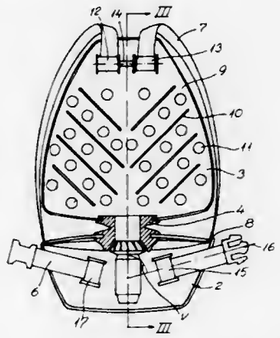
PCT No. PCT/DK94/00208, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1995, PCT Pub. No. WO94/27485, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Ser. No. 553,282

Claims priority, application Denmark, May 28, 1993, 0619/93

Int. Cl.[6] A47L *5/36*

U.S. Cl. 15—327.5 **12 Claims**



1. A backpack vacuum cleaner comprising a housing enclosing a motor and an impeller to provide the suction effect and with a compartment for a filter bag, a connection branch for a suction hose, a hip strap to be applied around the hips of the bearer and a pair of shoulder straps, wherein the housing is divided in upper and lower parts connected with a flexible connection allowing a tilting movement between said upper and lower parts, said hip strap being fastened to the lower housing part and said shoulder straps extending from said lower housing part to said upper housing part and being mutually interconnected by means of an equalizing device for equalizing differences in tension between the straps in the pair of shoulder straps.

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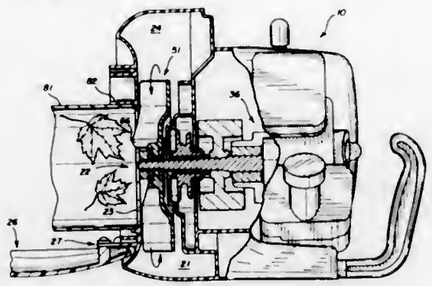
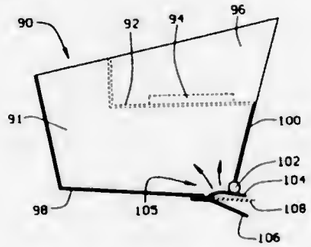
5,588,178
IMPELLER FOR BLOWER/VACUUM
Li-Hsiung Liu, Tucson, Ariz., assignor to McCulloch Corporation, Tucson, Ariz.
Filed Jun. 7, 1995, Ser. No. 478,449
Int. Cl.[6] A47L *5/24*
U.S. Cl. 15—330 **5 Claims**



1. Apparatus having a vacuum mode of operation, comprising a housing, a drive shaft mounted in said housing for rotation on an axis, an impeller fastened to said drive shaft and rotatable therewith, said housing forming an air flow channel around said impeller, said channel having a central air intake opening adjacent said axis and an air outlet opening adjacent the outer periphery of said impeller, said impeller comprising a hub fastened to said drive shaft, a plurality of blades extending generally radially outwardly from said hub, and a back plate extending generally radially outwardly from said hub, each of said blades having a back edge attached to said back plate, said plurality of blades including a first set of blades and a second set of blades, said second set of blades including a mulching part adjacent said hub, said mulching part of said second set of blades extending substantially parallel to said axis of rotation and extending forwardly of said first set of blades.

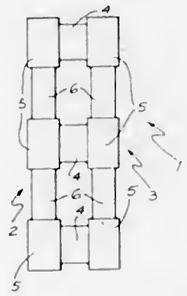
5,588,179
DUST BOX EMPTYING DEVICE
Douglas A. Bargiel, Bowling Green; Jack L. Burgoon, Toledo, and Michael D. Combs, Bowling Green, all of Ohio, assignors to Clarke Industries, Inc., Bowling Green, Ohio
Filed Feb. 1, 1995, Ser. No. 381,726
Int. Cl.[6] E01H *1/08*
U.S. Cl. 15—349 **15 Claims**



1. In a sweeper having a hopper separated into a main hopper and a dust box, a filter disposed within the dust box and dividing the dust box into a clean side and a dirty side, the hopper having an inlet for influx of debris, the dust box having an inlet for influx of debris, the hopper being movable between a debris accumulation position and a debris discharge position, and an outlet in a wall of the dust box for removal of debris accumulated within the dust box, the sweeper characterized by:

a flap of resilient material disposed over the dust box outlet and operable to close the dust box outlet when the hopper is in the debris accumulation position, and to open the dust box outlet in the debris discharge position, said flap having at least one opening therein through which debris is adapted to be discharged when the hopper is in its said debris discharge position.

5,588,180
HINGE
Brian Chester, Potts Point, Australia, assignor to Trychest Proprietary Limited, Potts Point, Australia
Filed Aug. 22, 1994, Ser. No. 293,706
Int. Cl.[6] E05D *1/00*
U.S. Cl. 16—225 **9 Claims**



1. A hinge assembly provided between first and second members having respective side faces permanently hinged to one another to permit their hinging movement relative to one another, each of said members having an elongated edge face and being formed with a socket that opens at its elongated edge face; the hinge assembly comprising a rigid, one-piece, hinging element composed of first and second axially parallel trunnions and at least one intervening bar all integrally formed in said element, said bar being formed as a web and said trunnions each including at least one cylindrical section, the cylindrical sections of respective trunnions being interconnected by said bar and said first and second trunnions being received in said sockets in said first and second members respectively in a manner which allows rotation of each member about the axis of the respective trunnion; the bar interconnecting the trunnions extending through the openings from the sockets, which openings are shaped to allow angular displacement of the bar about an axis extending parallel to and lying between the axes of respective trunnions, and wherein the axial length of said one cylindrical section of each trunnion is greater than the length parallel to said elongated edge face of the opening through which the bar extends, whereby the socket completely surrounds part of the axial length of the trunnion.

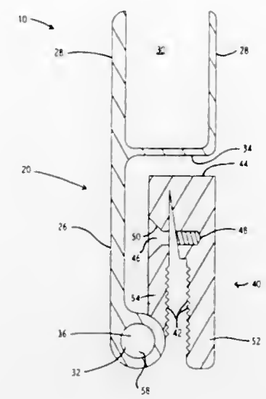
5,588,181
HINGE FOR A GLASS SHOWER DOOR
Michael R. Sutton, 15745 E. Alta Vista Way, San Jose, Calif. 95127
Filed Mar. 23, 1995, Ser. No. 409,200
Int. Cl.[6] E05D *5/02*
U.S. Cl. 16—252 **20 Claims**

1. A hinge, comprising:

at least one clamping member, said clamping member being generally U-shaped, said clamping member having a first leg and a second leg, said first leg having an end,

a strip member, said strip member being generally shaped like a lower case h, said strip member having an upper leg, said upper leg having an end,

and a point of rotation at which said end of said first leg of said clamping member is joined with said end of said upper leg of said strip member.



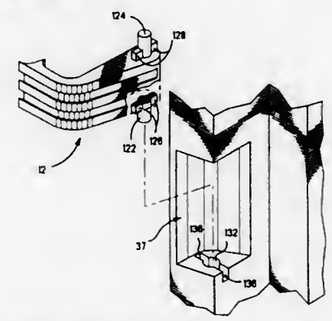
said mounting section further including stop means cooperable with said leg end when said door has been rotated to said open position and said side surface of said leg end has become translated to said second level, to selectively inhibit rotation of said door from said open position to said closed position,

whereby said two-tiered seating permits said leg end and its said side surface to be translated along said pivoting axis, from a first level when said door is in said closed position, to said second level when said door has been pivoted to said open position, and prevents said door to be pivoted from said open position to said closed position unless said leg end has first been translated to said first level by manipulation of said door.

5,588,183

Patent Not Issued For This Number

5,588,182
ARRANGEMENT FOR SECURING A DOOR TO AN ENCLOSURE
Alan W. Brownlie; David T. Middleton, Jr., both of Skaneateles, N.Y.; James W. Robertson, Oberlin, and Francis J. Shay, Palmyra, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.
Division of Ser. No. 32,890, Mar. 18, 1993, Pat. No. 5,473,115. This application May 31, 1995, Ser. No. 455,925
Int. Cl.[6] E05D *1/06*
U.S. Cl. 16—268 **8 Claims**



1. A securing arrangement for securing a door to an enclosure to permit pivoting of the door between open and closed positions, comprising:

at least one leg extending to an end thereof from a door for pivotal connection thereof to an enclosure;

a mounting section of said enclosure associated with said leg and shaped to define a clearance for said leg end to permit said leg end to be pivoted a selected angular distance when said door is rotated between open and closed positions; and

an axle at least including a segment protruding from a side surface of said leg end transversely to define a pivoting axis, said axle being affixed to said leg end and said mounting section in a manner permitting pivoting with respect to at least one of said leg and said mounting section,

said mounting section including a bearing surface adjacent said side surface of said leg end and having an axle-receiving aperture extending at least into said bearing surface, said bearing surface being shaped to define a two-tiered seating providing for said leg end and said side surface thereof to be translated along said pivot axis between first and second levels when said door is rotated between closed and open positions respectively,

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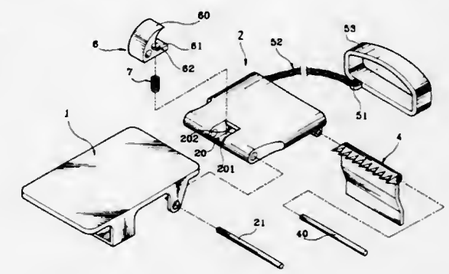
5,588,184
BELT BUCKLE
Kuo-Jen Chen, No. 187, Hua Yin Street, Taipei, Taiwan
Filed Feb. 20, 1996, Ser. No. 604,023
Int. Cl.[6] A44B *11/00*
U.S. Cl. 24—170 **2 Claims**



1. A belt buckle of the type comprising a belt having a fixed end, a free end, and a longitudinal series of transverse teeth raised from said free end at a back side, a buckle body, a belt catch holder pivotably connected to said buckle body by a first pivot pin, a serrate plate pivotably connected to said belt catch holder by a second pivot pin to hold down the fixed end of said belt, and belt catch means for securing the free end of said belt to said buckle body, wherein said belt catch means comprises:

a recess formed on said belt catch holder through which said first pivot pin passes;

a horizontal rib raised from said belt catch holder above said recess;

a belt catch mounted in said recess and turned about said first pivot pin, said belt catch comprising a stop wall stopped against said horizontal rib, an arched pawl forced into engagement with the transverse teeth of the free end of said belt, a bottom blind hole; and

a compression spring mounted within said recess, having one end stopped at a bottom wall inside said recess and an opposite end fastened to the bottom blind hole of said belt catch to render an outward pressure to said belt catch, causing said belt catch to force said pawl into engagement with the transverse teeth of said belt.

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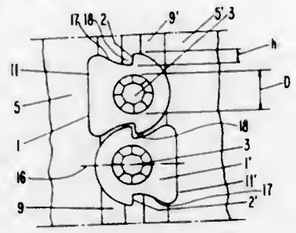
5,588,185
ZIPPER CLOSURE

Christian Covi, Fritzens, and Werner Steinlechner, Jenbach, both of Austria, assignors to D. Swarovski & Co., Wattens, Austria

Filed May 10, 1995, Ser. No. 437,979
Int. Cl.[6] A44B *19/02; 19/06*
U.S. Cl. 24—381 10 Claims



1. A zipper closure comprising:

first and second longitudinal bands each having a longitudinal edge bead;

first and second rows of plastic teeth mounted on said beads of said first and second bands, respectively, such that said first row of teeth face said second row of teeth and are offset therefrom in the longitudinal direction of said bands;

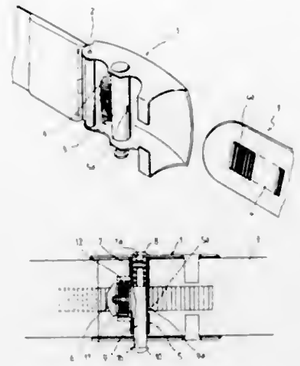
each said tooth extending in a direction normal to said longitudinal direction and having a base end mounted on the respective said bead and a free end having formed therein a channel extending parallel to said longitudinal direction, each said tooth having a configuration that is symmetrical relative to a center plane of said tooth extending in said normal direction thereof, each said tooth having an upper surface having embedded therein a decorative stone, and each said tooth having on opposite sides thereof and on opposite sides of said center plane thereof respective support surfaces, each said support surface extending outwardly from and defining with an adjacent side surface of said tooth a recess that is open toward opposite ends thereof in a direction of thickness of said tooth;

said zipper closure having a closed position whereat said first and second rows of teeth mesh, with said channel at said free end of each said tooth receiving said edge bead of the respective other said band, with said opposite support surfaces of each said tooth being in abutting contact with support surfaces of adjacent teeth of said other band, and with middle points of said decorative stones of all of said teeth aligned in a straight line extending in said longitudinal direction.

5,588,186
BELT WITH RATCHET TYPE BUCKLING MEANS

Soon-Myung Ko, 122-1703 Olympic APT, Bangee-Dong, Songpa-gu, Seoul 138-150, Rep. of Korea

Filed May 26, 1995, Ser. No. 451,179
Int. Cl.[6] A44B *11/00*
U.S. Cl. 24—585 3 Claims



1. A belt with ratchet type buckling means comprising:

a buckle coupled to an end portion of the belt, the top and bottom walls of said buckle having a screw hole and a rectangular hole respectively;

a ratchet part provided on the back surface of the other end portion of the belt; and

a rotatable cylinder vertically placed between the screw hole and the rectangular hole and rotatably coupled to the screw hole;

a pawl coupled to said cylinder and adapted for selectively engaging with said ratchet part;

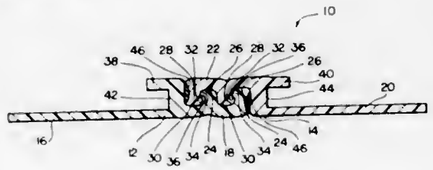
a vertically movable push rod received in said cylinder such that the bottom of the push rod projects out of the rectangular hole, said push rod being biased by a spring member downward; and

means for selectively rotating said cylinder along with the pawl to make the pawl disengage from the ratchet part when said push rod vertically moves up in the cylinder.

5,588,187
EXTRUDED ZIPPERS FOR UPHOLSTERY APPLICATIONS

Henry L. Swain, Readington, N.J., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Aug. 17, 1995, Ser. No. 516,297
Int. Cl.[6] A44B *17/00*; B65D *33/00*
U.S. Cl. 24—587 9 Claims



1. An extruded zipper comprising:

a first flexible closure strip and a second flexible closure strip; each flexible closure strip being extruded from a polymeric resin material, and having a web, an interlocking portion, and a flange; said web and said flange of each flexible closure strip extending from its respective interlocking portion substantially parallel to one another and defining therebetween on each flexible closure strip a groove; said interlocking portions of said first and second flexible closure strips being interlockable with one another in an interference fit; wherein

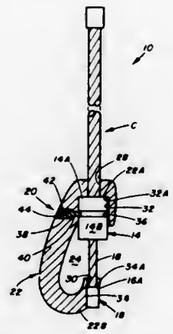
said web and said interlocking portion of said first flexible closure strip are substantially coplanar with one another; said web and said flange of said second flexible closure strip are substantially coplanar with one another; and said grooves between said flange and said web of each of said first and second flexible closure strips are of substantially identical width;

so that, when said interlocking portions of said first and second flexible closure strips are interlocked with one anther, said flanges of said first and second flexible closure strips are substantially coplanar with one another and said webs of said first and second flexible closure strips are substantially coplanar with one another.

5,588,188
SWAGED CABLE SWIVEL HOOK ASSEMBLY AND SWIVEL HOOK THEREFOR

Richard A. Jermyn, Jr., Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1995, Ser. No. 559,877
Int. Cl.[6] A44B *13/00*
U.S. Cl. 24—598.7 20 Claims



5. A swaged swivel hook assembly for attachment to an elongated cable, said assembly comprising:

(a) a swivel hook including

(i) an arcuate-shaped hook body defining a cavity and having a pair of upper and lower end portions spaced apart from one another and defining an opening through said hook body to said cavity,

(ii) means defining an upper bore through said upper end portion of said hook body,

(iii) means defining a lower bore through said lower end portion of said hook body, said upper and lower bores for receiving a portion of an elongated cable to provide a closure of said opening through said hook body to said cavity,

(iv) means forming an upper socket in said upper end portion of said hook body adjacent to said upper bore therethrough, and

(v) means forming a lower socket in said lower end portion of said hook body adjacent to said lower bore therethrough;

(b) an upper swage element for attachment to the portion of the elongated cable at a first location thereon and being removably seatable within said upper socket in said upper end portion of said hook body for supporting said hook body on the elongated cable; and

(c) a lower swage element for attachment to the portion of the elongated cable at a second location thereon spaced below the first location thereon and being removably seatable within said lower socket in said lower end portion of said hook body for securing to and releasing from said hook body the closure provided by the portion of the cable extending through said upper and lower bores of said hook body.

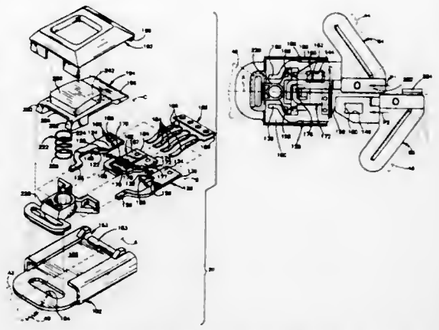
5,588,189
BUCKLE FOR VEHICLE SEAT BELT SYSTEM

Patrick J. Gorman, White Lake; Phillip D. Yee, Troy, both of Mich., and Mark F. Gray, New Market, Canada, assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Aug. 23, 1995, Ser. No. 518,231
Int. Cl.[6] A44B *11/00*
U.S. Cl. 24—632 16 Claims

1. A buckle for use in a vehicle seat belt system, said buckle comprising:

a base at least partially defining a cavity for receiving first and second tongues of the seat belt system, each of the tongues



being movable a fully inserted distance into the cavity along first and second insertion paths, respectively;

a first latch plate supported by said base and being movable between a latched position preventing withdrawal of the first tongue from the cavity and an unlatched position permitting withdrawal of the first tongue from the cavity;

a second latch plate supported by said base and being movable between a latched position preventing withdrawal of the second tongue from the cavity and an unlatched position permitting withdrawal of the second tongue from the cavity;

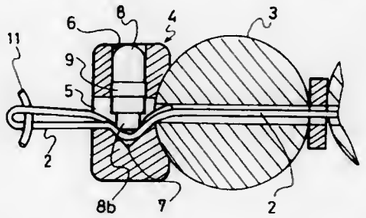
a first blocking member having a portion located in the second insertion path for blocking movement of the second tongue the fully inserted distance into the cavity until the first tongue moves a first predetermined distance into the cavity along the first insertion path; and

a second blocking member having a portion located in the first insertion path for blocking movement of the first tongue the fully inserted distance into the cavity until the second tongue moves a second predetermined distance into the cavity along the second insertion path.

5,588,190
ACCESSORIES

Takashi Sato, Chiba, Japan, assignor to Murao Co., Ltd., Chiba, Japan

Filed Jun. 30, 1995, Ser. No. 497,395
Int. Cl.[6] A44C *11/00*; A44B *21/00*
U.S. Cl. 24—682.1 8 Claims



1. An accessories wherein a series of decorative bodies are coupled one after another by means of wire string, each end of the wire string is passed through a through-passage formed in a wire string fastener and through a turn-back portion of clasp, the end of the wire string thus passed through is then turned back to be again passed through the through-passage where said each of the wire string is fixed by means of a fixing means, which is characterized in that;

each of said wire string fasteners is provided with a fastening hole, one end of which being communicated with said through-passage and the other end of which being open to outside;

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said fixing means is formed of fixing pin which can be fittingly inserted into said fastening hole; and

said fixing pin is provided on its peripheral wall portion with a collapsible projected portion extending slightly larger than the inner diameter of said fastening hole, said projected portion being disposed at such a location on said fixing pin that said projected portion can be press-contacted with the vicinity of the opening portion of the fastening hole so as to be held by said opening of the fastening hole before the tip portion of the fixing pin is introduced into said through-passage and that said projected portion can be collapsed and frictionally held by the inner wall of said fastening hole when said tip portion of said fixing pin is further inserted into said through-passage.

5,588,191

ANCHORING EYELET FOR TARPAULINS AND SIMILAR COVERINGS

Peter Sølbeck, Rungsted Kyst, Denmark, assignor to Polysheet A/S, Herlev, Denmark

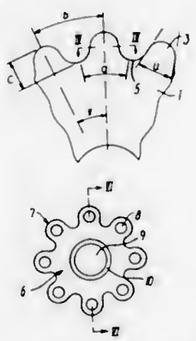
PCT No. PCT/DK93/00314, § 371 Date Apr. 20, 1995, § 102(e) Date Apr. 20, 1995, PCT Pub. No. WO94/09232, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 30, 1993, Ser. No. 416,891

Claims priority, application Denmark, Oct. 20, 1992, 1278/92; Dec. 28, 1992, 1564/92

Int. Cl.[6] A43C *5/00*

U.S. Cl. 24—713.6 **12 Claims**



1. An anchoring eyelet for tarpaulins and similar coverings of a thermoplastic foil material, which eyelet is designed as a relatively thin, flat and substantially annular disc (1) of plastic material provided with an eyelet opening (2), characterized in that the peripheral part of the eyelet disc is designed with indentations to provide increased resiliency to said peripheral part.

5,588,192

PROFILED CYLINDER FOR TEASELING AND/OR FLUFFING MACHINES

Franco Bertoldo, Brogliano, and Gino Dalla Vecchia, Santorso, both of Italy, assignors to Sperotto Rimar S.p.A., Milan, Italy

Filed Jan. 27, 1995, Ser. No. 379,154

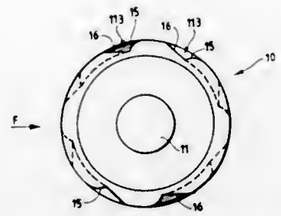
Claims priority, application Italy, Jan. 27, 1994, M194A0130

Int. Cl.[6] D06C *11/00*

U.S. Cl. 26—37 **1 Claim**

1. A profiled cylinder for a teaseling and/or fluffing machine, comprising:

a cylinder having a generally cylindrical outer peripheral surface, two axially opposite ends, and, projecting axially outwards at said ends, two respective support hubs, for rotation of the cylinder about a longitudinal axis thereof;



each said outer peripheral surface having a circumferentially extending series of alternating crests and recesses, each extending from end to end of said surface;

each crest being defined between two angularly opposite flanks, both of which are oblique to said longitudinal axis, so as to twist about said axis;

said surface being arranged for abraiding engagement with a fabric by turning of the cylinder about said axis while maintaining the fabric in engagement with said surface;

each said crest and each recess being generally arched in transverse cross-sectional shape, each recess having a smaller radius of curvature in transverse cross-sectional shape than each crest;

both said flanks of each crest twisting about said axis in two opposite angular senses, so that each crest is trapezoid-shaped in front elevational profile; and

on each crest, a respective one of said flanks being generally flat in transverse cross-sectional profile and the other being generally convex in transverse cross-sectional profile.

5,588,193

Patent Not Issued For This Number

5,588,194

METHOD AND DEVICE FOR THE ACCUMULATION OF A YARN OVERLENGTH BETWEEN A BOBBIN CREEL AND THE BEAM ON A BEAMING MACHINE

Horst Ulbrich, and Martin Fuhr, both of Niederuzwil, Switzerland, assignors to Benninger AG, Uzwil, Switzerland

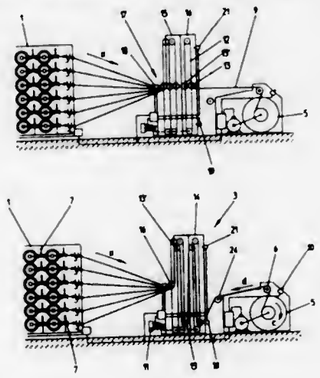
Filed Oct. 4, 1995, Ser. No. 538,649

Claims priority, application Switzerland, Nov. 10, 1994, 3363/94

Int. Cl.[6] D02H *13/22*

U.S. Cl. 28—194 **11 Claims**

1. Method of accumulating an overlength of yarns between a



bobbin creel (1) and the beam (5) of a beaming machine (4), upon cessation in beaming, said method comprising steps of

deflecting a yarn warp (2) from a beaming position into an accumulation position under the formation of yarn loops by means of accumulator rollers (13, 13') that are displaceable in relation to one another, while rotating the beam (5) in a reverse direction,

subjecting each yarn to a defined braking tension at the bobbin creel, while maintaining the reverse speed of the beam at less than the accumulation speed of the accumulator rollers so that the length difference arising from the difference between the reverse speed and the accumulation speed is compensated for by further withdrawal of yarns from the bobbin creel under the influence of yarn braking tension.

5,588,195

ELECTRONIC-COMPONENT MOUNTING APPARATUS

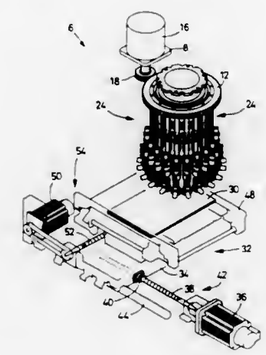
Koichi Asai, Nagoya; Koso Matsumoto, Aichi, and Yasuo Muto, Chiryu, all of Japan, assignors to Fuji Machine Mfg. Co., Ltd., Aichi-ken, Japan

Filed Sep. 14, 1995, Ser. No. 527,984

Claims priority, application Japan, Sep. 26, 1994, 6-229496

Int. Cl.[6] H05K *13/04*

U.S. Cl. 29—33 M **11 Claims**



1. An electronic-component mounting apparatus, including

a frame member,

a movable member supported by said frame member such that said movable member is movable relative to the frame member,

a moving device which moves said movable member relative to said frame member,

a mounting head which is provided on said movable member and mounts an electronic component on an object such as a printed circuit board, and

at least two devices selected from (a) at least one rotating device including a first actuator which rotates said mounting head about an axis line thereof, (b) at least one advancing and retracting device including a second actuator which advances and retracts said mounting head in opposite directions parallel to an axis line thereof, respectively, (c) at least one vacuum-supply control device including a third actuator which controls vacuum supply to a suction nozzle of said mounting head, and (d) at least one suction-nozzle selecting device including a fourth actuator which selects one of a plurality of suction nozzles of said mounting head,

said at least two devices including at least two actuators selected from at least one said first actuator, at least one said second actuator, at least one said third actuator, and at least one said fourth actuator,

wherein the improvement comprises:

said at least two actuators including at least two electric actuators which are provided on said movable member and are operable on electric energy;

a power source which is provided on said frame member and provides said electric energy;

a main control device which is provided on said frame member;

an actuator control device which is provided on said movable member and controls said electric actuators;

an electricity supplying device which includes a first supplying section provided on said frame member and a second supplying section provided on said movable member and which supplies said electric energy from said power source to said actuator control device, without having any wire connection between said first and second supplying sections; and

an information transmitting device which includes a first transmitting section provided on said frame member and a second transmitting section provided on said movable member and which transmits, between said main control device and said actuator control device, information needed to control said electric actuators, without having any wire connection between said first and second transmitting sections.

5,588,196

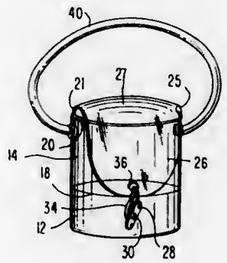
METHOD FOR MAKING A CONTAINER FROM RECYCLED PRODUCT

Judy A. Samelson, 75 Wilson's La., Needham, Mass. 02194

Division of Ser. No. 154,820, Nov. 19, 1993, Pat. No. 5,464,108. This application Jun. 23, 1995, Ser. No. 493,891

Int. Cl.[6] B21K *21/16*

U.S. Cl. 29—401.1 **2 Claims**



1. A method of recycling a plastic, substantially cylindrical, conventional, soda bottle having an upwardly extending and gradually inwardly sloping neck extending from the cylindrical holding section, into a container for articles comprising the steps of:

a. cutting the cylindrical side wall of said bottle with a first horizontal cut extending between points on a diameter of the side wall of said bottle;

b. making a second cut in an arc extending between said points on said same diameter toward the neck of said bottle, and

c. removing said neck end from said cylindrical holding section, said holding section thereby forming a holding cavity and a closing mechanism, at least a portion of said remaining portion of said side wall defining a fold-over flap, hinged about said points on said diameter, said first cut and said second cut extending between said diameter points in the side wall of said bottle.

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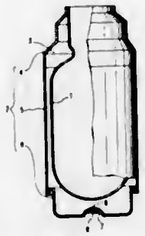
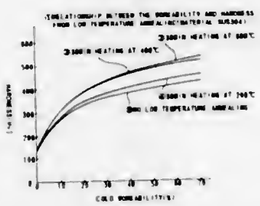
5,588,197

METHOD OF MANUFACTURING METALLIC VACUUM DOUBLE-WALLED CONTAINER

Yasuhiko Satomi; Seiichi Itoh; Eiji Otsuka; Jun Yamaki, and Takashi Kato, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Division of Ser. No. 165,405, Dec. 10, 1993, abandoned. This application May 16, 1995, Ser. No. 442,202
Claims priority, application Japan, Dec. 24, 1992, 4-344927
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—455.1 **2 Claims**





1. A metallic vacuum double-walled container manufacturing method comprising the steps of:

rolling at least the steel plate of an outer container to a Vickers hardness of 250–600;

shaping said outer container into a cylindrical body;

forming a metallic double-walled container by joining said outer container and a processed inner container at their mouth portions;

heat treating said metallic double-walled container at a temperature of 200°–600° C. under a vacuum; and

vacuum sealing the space between the two walls of said metallic double-walled container.

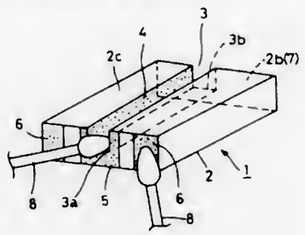
5,588,198

METHOD OF REGULATING RESONANCE FREQUENCY OF SURFACE-MOUNTABLE ANTENNA

Kazunari Kawahata, and Yuichi Kushihi, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 6, 1995, Ser. No. 399,238
Claims priority, application Japan, Mar. 9, 1994, 6-038680
Int. Cl.[6] H01P *11/00*
U.S. Cl. 29—600 **12 Claims**

1. A method of regulating the resonance frequency of a surface-mountable antenna, comprising the steps of:



preparing a surface-mountable antenna including a substrate made of a dielectric material, a groove being formed on an upper surface of said substrate to have end portions at a pair of opposite end surfaces of said substrate, a radiating electrode being formed on the inner peripheral surface of said groove, a feeding electrode being formed on one of said pair of opposite end surfaces of said substrate in conductive connection with said radiating electrode, a ground electrode being formed on one of said pair of end surfaces to be insulated from said feeding electrode, and an end electrode being formed on the other one of said pair of opposite end surfaces of said substrate; and

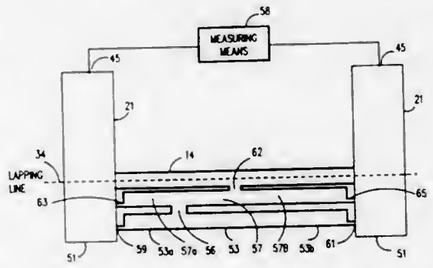
partially trimming said radiating electrode, said ground electrode or said end electrode for regulating the resonance frequency of said surface-mountable antenna.

5,588,199

LAPPING PROCESS FOR A SINGLE ELEMENT MAGNETORESISTIVE HEAD

Mohamad T. Krounbi; Hin P. E. Lee, both of San Jose, and David J. Seagle, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1994, Ser. No. 339,523
Int. Cl.[6] G11B *5/42*
U.S. Cl. 29—603.1 **3 Claims**



1. A method of manufacturing a magnetoresistive head, comprising the steps of:

depositing a magnetoresistive element on a substrate, said magnetoresistive element having end regions separated by a central region;

depositing first and second electrically conductive leads in contact with said magnetoresistive element in said end regions, each said conductive lead having a portion extending beyond said magnetoresistive element;

depositing at least one shunt resistor between said magnetoresistive element and an air bearing surface, said shunt resistor being electrically connected at a first end thereof to said extending portion of the first conductive lead and being electrically connected at a second end thereof to said extending portion of the second conductive lead, sand shunt resistor being electrically connected at a central point thereof to said magnetoresistive element in said central region, said shunt resistor and said MR element forming a resistor network;

lapping said air bearing surface for removing said shunt resistor, said extending portions of the conductive leads and portions of said magnetoresistive element for providing a magnetoresistive element having a desired element height; and

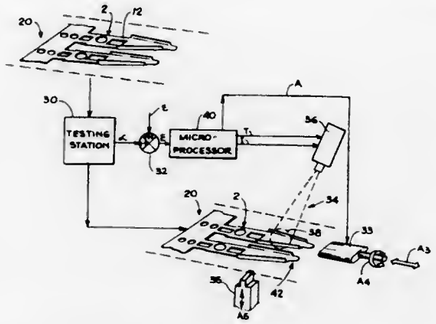
monitoring the electrical resistance of said resistive network during said lapping for determining the amount of lapping skew.

5,588,200

TIGHTENED DISTRIBUTION OF MAGNETIC-HEAD SUSPENSION-ASSEMBLY STATIC ROLL BY INFRARED STRESS RELIEF

Dale F. Schudel, T. Lamsai A.Wangnoi THX, assignor to K. R. Precision Public Company Limited, Axutthaya THX

Filed May 15, 1995, Ser. No. 441,351
Int. Cl.[6] G11B *5/10*
U.S. Cl. 29—603.01 **14 Claims**



1. In a manufacturing process for a magnetic head suspension assembly having a head slider mounted on a metallic suspension intended for read/write application in very close proximity over a surface of a magnetic disc, a method for adjusting statics roll characteristics of said suspension assembly to conform to a predetermined parameter, wherein said static roll characteristics are measured by at least one deformation parameter indicative of the suspension assembly's static roll attitude, the process comprising the following steps:

(a) flexing said suspension assembly to a predetermined degree of deformation to cause said at least one deformation parameter indicative of the suspension assembly's static roll attitude to conform to said predetermined parameter; and

(b) while the suspension assembly is in such flexed state, applying a beam of thermal energy to a predetermined target area in the suspension assembly for a predetermined time to relieve stresses in the suspension assembly so as to cause said at least one deformation parameter to conform to said predetermined parameters while the suspension assembly is in a free state.

5,588,201

PROCESS FOR PRODUCING A CAST RESIN COIL

Friedrich Alber, Kösen; Rudolf Dedelmahr, Aichtal; Winfried Jungnitz, Weilheim-Engelsberg; Hans Schott, Lenningen; Heinz Sesterheim, Kirchheim, and Siegfried Weiss, Bissingen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/EP91/00552, § 371 Date Sep. 21, 1993, § 102(e) Date Sep. 21, 1993, PCT Pub. No. WO92/16955, PCT Pub. Date Oct. 1, 1992
PCT Filed Mar. 21, 1991, Ser. No. 122,424
Int. Cl.[6] H01F *7/06*
U.S. Cl. 29—605 **14 Claims**

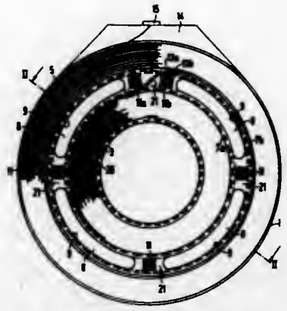
1. A process for producing a cast resin coil comprising a plurality of axially superimposed flat coils each of the flat coils including an inner winding, an outer winding, and a plurality of spacers disposed between the inner and outer windings thereby defining a plurality of sector-shaped intervening spaces between the inner and outer windings, said method comprising the steps of:

a) producing a first flat coil by:

winding a first inner winding using a first conductive element;

disposing a first plurality of spacers;

winding a first outer winding from said first conductive element;



applying a first layer of impregnable material between the first inner and outer windings in a first plurality of circumferential sections between each of the first plurality of spacers; and

transferring the first conductive element from the first inner winding to the first outer winding in a first connecting web between two of the first plurality of spacers;

b) producing a second flat coil by:

winding a second inner winding using a second conductive element;

disposing a second plurality of spacers;

winding a second outer winding from said second conductive element;

applying a second layer of impregnable material between the second inner and outer windings in a second plurality of circumferential sections between each of the second plurality of spacers; and

transferring the second conductive element from the second inner winding to the second outer winding in a second connecting web between two of the second plurality of spacers;

c) axially superimposing said first and second flat coils;

d) aligning said first and second plurality of sector-shaped intervening spaces thereby forming a plurality of axial cooling channels;

e) disposing a molding into each of the plurality of axial cooling channels;

f) encapsulating the superimposed first and second flat coils, whereby the first and second plurality of spacers form stiffening webs between the inner and outer windings when encapsulated; and

g) removing every molding from the plurality of axial cooling channels after encapsulation.

5,588,202

METHOD FOR MANUFACTURING AN OVERMOLDED SENSOR

Wayne L. Ehlers, Lanark; Kenneth L. Eichholz, Jr., and Mark F. Johnston, both of Freeport, all of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 17, 1995, Ser. No. 406,079
Int. Cl.[6] H01F *7/06*
U.S. Cl. 29—606 **17 Claims**

1. A method for manufacturing a proximity sensor, comprising:

providing a printed circuit board having a first side and a second side;

perforating said printed circuit board to form a plurality of substrate sections connected together by a plurality of ribs, each of said plurality of substrate sections having a first plurality of electrically conductive paths formed thereon;

attaching a first plurality of electronic components to said first side of each of said plurality of substrate sections, each of said first plurality of electronic components being connected in electrical communication with at least one of said first plurality of electrically conductive paths of a preselected one of said

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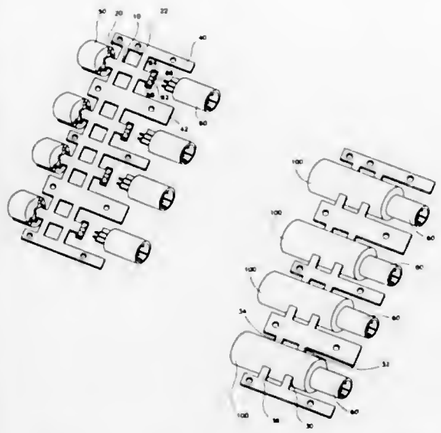


plurality substrate sections to form a first electrical circuit on each of said plurality of substrate sections;

attaching an electrical coil to a first end of each of said plurality of substrate sections;

attaching an electrical connector to a second end of each of said plurality of substrate sections;

calibrating each of said first electrical circuits;

simultaneously forming a plurality of encapsulations, each of said plurality of encapsulations being disposed around one of said plurality of substrate sections and its associated electronic components, coil and connector; and

severing said ribs to detach each of said plurality of encapsulations from said printed circuit board.

5,588,203

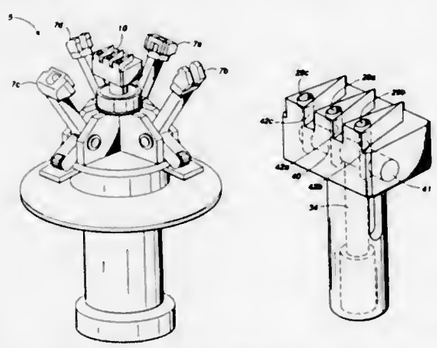
NOZZLE FOR A VACUUM MOUNTING HEAD

Branko Bidefeld, Marietta, Ga., assignor to Matsushita Communication Industrial Corporation of America, Peachtree City, Ga.

Filed Feb. 28, 1995, Ser. No. 397,634

Int. Cl.[6] B23P *19/04;* **H01L** *21/68;* **H05K** *13/04*

U.S. Cl. 29—743 **17 Claims**



1. A nozzle for a mounting head of a component placement machine, comprising:

a positioning block defined by a top and a bottom,

said top of said block having a particular area, and

said bottom of said block having an area that is less than or equal to said particular area;

said block defining a plurality of spaced apart pads on top of said block, each of said pads having a top, and a pad hole in said top or said pad;

said block timer defining an opening in said bottom of said block; and

said block defining an interior air passage connecting each of said pad holes with said opening.

5,588,204

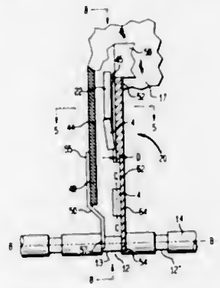
APPARATUS FOR INSTALLING SPRING RETAINING RINGS

Kenneth J. Rossman, Kendall Park, N.J., assignor to Rotor Clip Company, Inc., Somerset, N.J.

Continuation-in-part of Ser. No. 309,854, Sep. 21, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,407

Int. Cl.[6] B23Q *7/10;* **B23P** *19/04*

U.S. Cl. 29—809 **8 Claims**



6. An apparatus for installing a spring retaining ring having two legs separated by a gap into a groove of a workpiece, said apparatus comprising:

storage means for initial storage of said spring retaining ring;

a passageway for delivery of said spring retaining ring from said storage means to said groove of the workpiece,

a receiving window positioned at the junction of said storage means and said passageway, said passageway having interior and exterior portions and an open end remotely located from said receiving window, and orientation means positioned within said interior portion of the passageway for orientation of said spring retaining ring, said orientation means being an elongated member extending along a longitudinal axis of said passageway; and

a pusher movable within said passageway for forcible delivery of said spring retaining ring to said groove;

whereby upon engagement of said ring with said pusher said ring is moved through said passageway in such a manner that said orientation means is slidably received within said recess of said spring retaining ring preventing rotational movement of said ring within said passageway and said legs and said gap of the retaining ring face said groove of said workpiece.

5,588,205

METHOD OF MANUFACTURING A HIGH DENSITY INTEGRATED CIRCUIT MODULE HAVING COMPLEX ELECTRICAL INTERCONNECT RAILS

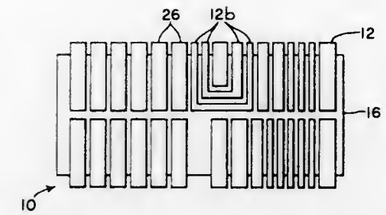
Jerry M. Roane, Austin, Tex., assignor to Staktek Corporation, Austin, Tex.

Division of Ser. No. 337,558, Jan. 24, 1995. This application Sep. 5, 1995, Ser. No. 523,201

Int. Cl.[6] H05K *3/36*

U.S. Cl. 29—830 **6 Claims**

1. A method of manufacturing a high density integrated circuit module which includes serpentine electrical interconnect rails, comprising the steps of:



(a) providing a stack of integrated circuit devices;

(b) mounting a rail assembly, comprised of a plurality of non-linear interconnect rails, to the upper major surface of the uppermost integrated circuit device within said stack, wherein said rail assembly includes upper and lower shorting bars;

(c) removing said upper shorting bar from an upper portion of said rail assembly, wherein said upper portion extends over said uppermost integrated circuit device in said stack;

(d) aligning said rails with selected electrical interconnect leads protruding from said integrated circuit devices in said stack; wherein selected electrical interconnect leads are inserted into openings formed in said rails;

(e) soldering said selected leads protruding through said openings in said rails to said rails; and

(f) removing said lower shorting bar from said rail assemblies.

5,588,206

METHOD FOR INSERTING WIRE-EQUIPPED TERMINAL IN CONNECTOR HOUSING

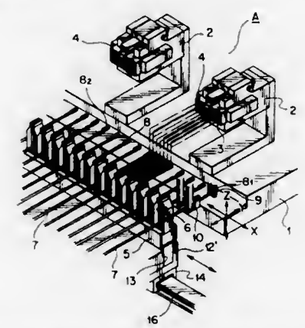
Takamichi Maejima; Toshihiro Inoue; Hiroshi Hasegawa, and Atsushi Nakano, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 344,665

Claims priority, application Japan, Nov. 29, 1993, 5-298102

Int. Cl.[6] H01R *43/00*

U.S. Cl. 29—845 **5 Claims**



1. A method of inserting a series of wire-equipped terminals held in clips of a wire-clamping rod into containers of a connector housing by means of openable and closable terminal-grasping picks and wire-clamping plates of an insertion unit, comprising the steps of:

a) vertically moving said insertion unit from a first position to a second position with respect to said wire-clamping rod in a direction to locate said picks in grasping relation with respect to the terminal of a first wire-equipped terminal and said plates in clamping relation to the wire thereof;

b) activating said picks and said plates to grasp said terminal and clamp said wire;

c) vertically moving said insertion unit in a reverse direction to separate said first wire-equipped terminal from said the associated clip;

d) advancing said insertion unit with respect to said connector housing while sequentially opening said picks and said plates to insert said first wire-equipped terminal in a first predetermined container in said housing for receiving said first wire-equipped terminal;

e) returning said insertion unit to said first position;

f) at anytime during the period of performance of step c) to step e) with respect to said first wire-equipped terminal, establishing the position of a second wire-equipped terminal with respect to a second predetermined container in said connector housing for receiving said second wire-equipped terminal; and

g) repeating steps a) through f) with respect to each of said second and succeeding wire-equipped terminals in said series.

5,588,207

METHOD OF MANUFACTURING TWO-SIDED AND MULTI-LAYERED PRINTED CIRCUIT BOARDS

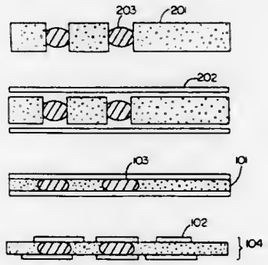
Kouji Kawakita, Joyo; Masahide Tsukamoto, Nara; Yasukiho Horio, Osaka; Seiichi Nakatani, Hirakata, and Akihito Hatakeyama, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 124,317, Sep. 20, 1993, Pat. No. 5,440,075. This application May 5, 1995, Ser. No. 437,085

Claims priority, application Japan, Sep. 22, 1992, 4-252594

Int. Cl.[6] H01K *3/10;* **H05K** *3/20*

U.S. Cl. 29—852 **36 Claims**



1. A method for producing a two-sided printed circuit board, comprising the steps of:

forming a plurality of through-holes in a base;

inserting a conductive spherical ball into each of the through-holes; and

heating and pressurizing the base and the conductive spherical balls while holding the base between two conductive layers so that the conductive spherical balls are deformed to substantially fill the through-holes thereby electrically connecting the conductive spherical balls and the two conductive layers, wherein the thickness of the base after the step of heating and pressurizing is smaller than the diameter of the conductive spherical ball before the step of heating and pressurizing.

5,588,208

METHOD OF ASSEMBLING SET OIL RING ON PISTON

Yutaka Sato; Koichi Morita; Shuzo Fujimoto; Satoru Ichihashi, and Kohji Ohsawa, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 357,270

Claims priority, application Japan, Dec. 22, 1993, 5-325364

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—888.044 **4 Claims**

1. A method of assembling a set oil ring in a piston ring groove having opposed wall surfaces in a piston in spaced relation from an end thereof, the set oil ring comprising a spacer ring and a pair of side rail rings having split end portions wherein the side rail rings

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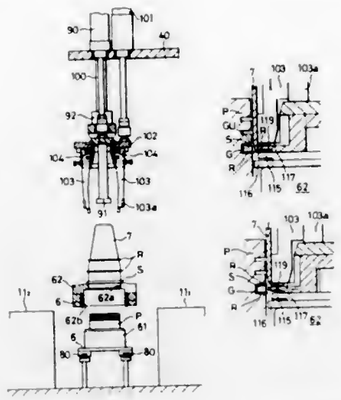


are to be placed in the piston ring groove on both sides of the spacer ring, including the steps of:

mounting the pair of side rail rings in axially spaced relation on a periphery of a guide member which can be fitted onto an external surface of the piston;

moving the guide member into concentric fitted disposition with respect to said piston;

sequentially pushing the pair of side rail rings from a front end of the guide member while the guide member is kept fitted onto the external surface of the piston, into first and second groove portions defined between cooperating oppositely spaced surfaces of the spacer ring and the piston ring groove when the spacer ring is positioned in the piston ring groove, said first groove portion being on the side of the spacer ring proximate the end of the piston, and said second groove portion being on the side of the spacer ring away from the end of the piston;

the improvement comprising the steps of:

in assembling one of the side rail rings into the first groove portion, axially moving one of the guide member and the piston relative to the other to a first position to locate the front end of the guide member at substantially the same level as a wall surface of the first groove wall portion, disposing a restricting member in front of the guide member while leaving a clearance exposing the first groove portion, and pushing the one of the side rail rings from the front end of the guide member into the first groove portion while continuously preventing overlap of the split end portions of the spacer ring by the restricting member; and

in assembling the other of the side rail rings into the second groove portion, axially moving one of the guide member and the piston relative to the other to a second position to locate the front end of the guide member at substantially the same level as the surface of the spacer ring defining the second groove portion, and pushing the other of the side rail rings from the from end of the guide member into the second groove portion while continuously preventing overlap of the split end portions of the spacer ring by an internal surface of the guide member, whereby the assembling of one of the side rail rings into the first groove portion and the assembling of the other of the side rail rings into the second groove portion are made continuously by sequentially changing the position of the restricting member relative to the first groove portion and the position of the guide member relative to the second groove portion while always preventing overlap of the split end portions of the space ring throughout the assembling steps of the side rail rings.

5,588,209

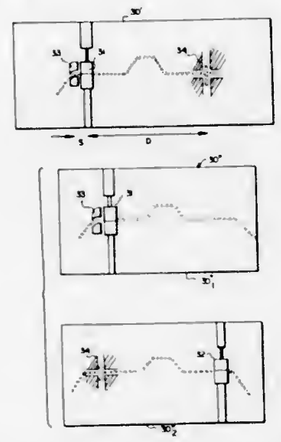
METHOD AND APPARATUS TO MANUFACTURE STABILIZER BARS

Ian A. Fisher, Chesterfield, and Philip Ferdani, Rugby, both of United Kingdom, assignors to The Tempered Spring Company Limited, England

Filed May 4, 1994, Ser. No. 237,759

Int. Cl.[6] B28B *5/00;* **B23P** *17/00*

U.S. Cl. 29—897.2 **14 Claims**



1. A method of manufacturing a vehicle sway bar comprising:

(i) forming a steel rod into a desired shape of bar,

(ii) defining for said bar a first portion at which a first suspension component is to be molded onto the bar; a second portion spaced a predetermined distance along said bar from said first portion, at which a second suspension component is to be molded onto said bar; and a datum point separated from said first portion of said bar by a predetermined spacing,

(iii) disposing said bar with respect to a molding apparatus, said apparatus having a mold adapted to receive and enclose one of said first and second portions of said bar, a first reference part separated from said mold by said predetermined spacing and a second reference part spaced from said first reference part by a distance equal to said predetermined distance between said first and second portions of said bar, with said datum point of said bar at said first reference part of the apparatus so that said first portion is within said mold,

(iv) molding onto said first portion of said bar from rubber or plastics material a first suspension component,

(v) thereafter disposing said bar with respect to the molding apparatus with said first suspension component at said second reference part so that said second portion of said bar is within said mold, and

(vi) molding onto said second portion of said bar from rubber or plastics material a second suspension component.

7. A method of manufacturing a vehicle sway bar comprising:

(i) forming a steel rod into a desired shape of bar,

(ii) defining for said bar shape a first portion at which a first suspension component is to be molded onto said bar; a second portion spaced a predetermined distance along said bar from said first portion, at which a second suspension component is to be molded onto said bar, and a datum point separated from said first portion by a predetermined spacing,

(iii) disposing said bar with respect to a molding apparatus, said apparatus having a first mold adapted to receive and enclose said first portion of said bar, a second mold adapted to receive and enclose said second portion of said bar, a first reference part separated from said first mold by said predetermined spacing, and a second reference part spaced from said first mold and spaced from said second mold by a distance equal to said predetermined distance between the first and second portions of said bar, with the datum point of said bar at said first reference part of the apparatus so that said first portion of said bar is within said first mold,

(iv) molding onto said first portion of said bar from rubber or plastics material a first suspension component,

(v) thereafter disposing said bar with respect to said molding apparatus with said first suspension component at said second reference part so that said second portion of said bar is within said second mold, and

(vi) molding onto said second portion of said bar from rubber or plastics material a second suspension component.

5,588,210

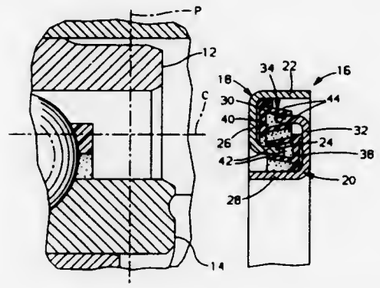
METHOD OF MANUFACTURING A UNITIZED SEAL

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1994, Ser. No. 286,362

Int. Cl.[6] B29C *45/08*

U.S. Cl. 29—898 **2 Claims**



1. A method of manufacturing and assembling a unitized seal for installation in an annular space between outer and inner, relatively rotatable members, said annular space being bisected widthwise by a central imaginary cylinder and bisected lengthwise by a central imaginary plane perpendicular thereto, said method comprising,

providing an outer, generally channel-shaped casing with an annular web extending radially inwardly past said bisecting cylinder and a cylindrical seal wall extending in one axial direction from said annular web to a terminal edge, said terminal edge having a predetermined radial thickness,

providing an inner, generally channel-shaped casing with an annular web extending radially outwardly past said bisecting cylinder and a cylindrical seal wall substantially identical in length to said outer casing seal wall but extending in the opposite axial direction from said annular web to a terminal edge having a comparable radial thickness,

providing an integrally molded seal unit having, in a pre-assembly state, a pair of inner and outer disks lying on said central plane and sized so as to abut outer and inner casing annular webs respectively, said inner and outer disks also being joined at a frangible seam lying on said central bisecting cylinder, said inner and outer disks each having a pair of axially oppositely extending converging seal lips symmetrically disposed about said outer and inner casing seal walls respectively and defining an annular opening of lesser radial width than said seal walls,

concentrically aligning said inner and outer casings with said seal unit axially between, and

moving said aligned inner and outer casing axially together, thereby pushing said inner and outer casing cylindrical seal wall terminal edges axially into said respective annular openings and against said inner and outer disks, fracturing said seam, and pushing said inner and outer disks into abutment with said respective annular webs.

5,588,211

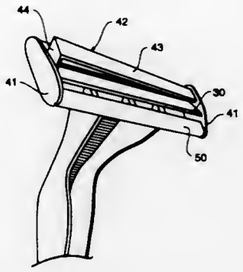
RAZOR WITH ANGLED BLADES AND GUIDES

Rafael Elul, P.O. Box 882941, San Francisco, Calif. 94188

Filed Oct. 29, 1994, Ser. No. 328,717

Int. Cl.[6] B26B *21/06*

U.S. Cl. 30—48 **5 Claims**



1. A razor comprising

an elongated blade having a longitudinal axis,

a blade holder connected to said blade,

an elongated member interconnected to said blade, said member having a slider plate fixedly inclined at an angle θ relative to the longitudinal axis of said blade and forming an elongated gap therebetween, said slider plate having a first end and a second end, the first end being attached to said blade holder, and

a support arm extending from said blade holder and attached to the second end of said slider plate.

5,588,212

SAFETY-BELT CUTTER

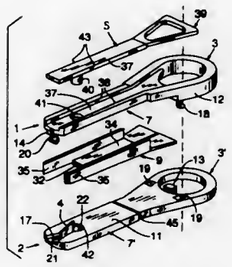
Antero Riihimäki, Soukankuja 4 B, FIN-02360, Espoo, Finland

Continuation-in-part of Ser. No. 23,084, Feb. 26, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,424

Claims priority, application Finland, Mar. 17, 1992, U920219

Int. Cl.[6] B26B *29/06;* **B60R** *22/32*

U.S. Cl. 30—123 **15 Claims**



1. A safety-belt cutter for cutting a safety-belt in the event of an emergency, the safety-belt cutter comprising:

a frame having an opening adapted for receiving a safety-belt therethrough, the frame completely encircling said safety-belt;

a cutting blade having a cutting edge attached to the frame and protruding into the opening, the blade engageable with the safety-belt disposed in said opening to cut the same upon movement of said frame transversely over said safety-belt positioned in said opening;

a slide disposed within the frame opening for receiving and closely supporting the safety-belt, support portions of the slide constraining the safety-belt to keep the safety-belt taut during the cutting movement of said blade; and

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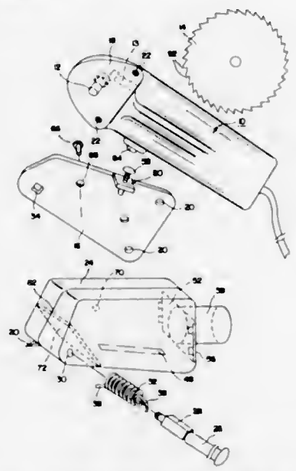
a guard means detachably secured to the frame and including a sheath positioned in front of the cutting blade cutting edge to prevent cutting of the safety-belt from inadvertent pulling movements upon said frame, the guard means detachable from the frame to remove said sheath from in front of the cutting edge to permit cutting of the safety belt.

5,588,213
CIRCULAR SAW WITH DUST TRAPPER
Alan M. Swanberg, 734 San Carlos Ct., Palo Alto, Calif. 94306
Filed Mar. 7, 1995, Ser. No. 400,036
Int. Cl.[6] B27B *9/02*
U.S. Cl. 30—124 **9 Claims**



1. A tool for collecting dust generated when sawing a board having a board surface using a saw of the type having a motor with a face surface and a mounting shaft extending perpendicularly from said face surface, said mounting shaft being coupled perpendicularly to a motor shaft of said motor with a circular saw blade rotatably mounted on said mounting shaft, said tool comprising:

a mounting plate having holes arranged for bolting said mounting plate to said face surface of said motor with a said mounting plate against said face surface with said mounting shaft extending through one of said holes of said mounting plate;

a hood having a base side with a slot and a first side having an edge joined perpendicularly to said base side along an edge of said base side and a second side having an exit opening adapted for attachment to a means for exhausting kerf from said hood and a plurality of other sides;

said base side, second side and said plurality of sides bounding an interior region within said hood;

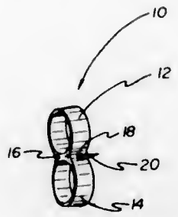
said first said having an elongated slot through which said mounting shaft extends into said interior region of said hood and supports said blade in said interior region;

said mounting plate positioned slidably against and rotatably mounted on said first side between a first position with respect to said hood and a second position with respect to said hood;

said first position being when said base side is positioned against said board surface and said circular saw is entirely positioned within said interior region and said interior region communicates only with said means for exhausting; and

said second position being wherein an edge of said saw blade extends through said slot and away from said base side whereby kerf generated in said interior region can escape only through said exit opening to said means for exhausting; a spring means for biasing said hood toward said first position.

5,588,214
SELF DEFENSE RING
Joe B. Nelson, 2012 Ogden La., Lancaster, Calif. 93535
Filed Oct. 10, 1995, Ser. No. 541,328
Int. Cl.[6] B26B *27/00*
U.S. Cl. 30—368 **7 Claims**



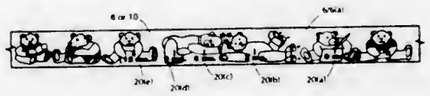
1. A new and improved self defense ring assembly comprising:

ring means positionable on the hand of a user, said ring means including at least two ring members positionable over at least two fingers of said user, said at least two ring members being fixedly attached together by a center section, said center section includes a hollow interior portion;

and

blade assembly means forming a part of said ring means and including a retractable blade utilizable for self defense purposes, said blade assembly means being substantially retained within said hollow interior portion.

5,588,215
TRANSPORTABLE MEASUREMENT DEVICE FOR CHILDREN'S CLOTHES
Penny F. Hart, 500 E. 83rd St., Apt. 2G, New York, N.Y. 10028
Filed May 25, 1994, Ser. No. 248,702
Int. Cl.[6] G01B *3/10*
U.S. Cl. 33—2 R **5 Claims**

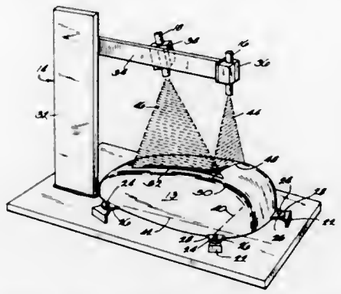


1. An apparatus for translating the value of a child's age into a set of physical dimensions representing an approximation of the child's anatomical measurements for comparison with an item of apparel, comprising:

(a) an elongated member having a surface;

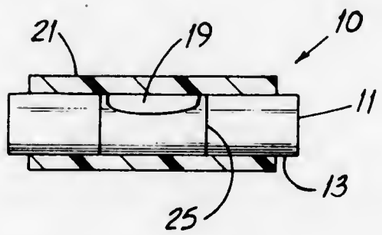
(b) a first reference-point on said surface and at least one age-based marking on said surface, each said at least one age-based marking indicating a unique age-based value, such that the distance between each said at least one age-based marking and said first reference-point approximates an anatomical dimension of a child having an age equal to that indicated by said at least one age-based marking, and further wherein each of said age-based markings states a different, specific, approximate age in months of a child wherein the distance between said first reference point and a select least one age-based marking can be compared to an item of apparel to determine if the item of apparel will fit a child whose age is approximately equal to the age represented by said select one of said at least one age-based marking.

5,588,216
GAS TANK GRAPHIC POSITIONING FIXTURE
David B. Rank, Waukesha, Wis.; Randall A. Bonebrake, Red Loin, and Spurgeon C. Stoner, York, both of Pa., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.
Filed May 19, 1995, Ser. No. 444,999
Int. Cl.[6] G01B *11/27*; **G03B** *21/00*
U.S. Cl. 33—286 **2 Claims**



1. A fixture for use in applying graphics to a part, said fixture having a support base, means mounted on said support base for fixing a part in a pre-determined fixed position on said base, said part fixing means including support means for supporting the part at three horizontally spaced apart locations for defining a fixed support plane for the part, a support member positioned horizontally above said support base, a pair of laser transmitters fixedly mounted on said support member in a horizontal spaced apart relation and vertically above said support base, said laser transmitters being constructed and arranged for projecting laser beams downwardly toward said base in planes, said laser transmitters being positioned such that said laser beams impact on a three dimensional part on said base as lines having a predetermined fixed alignment pattern whereby graphic material may be aligned on successive parts in an accurate repeatable basis.

5,588,217
LEVEL VIAL ASSEMBLY WITH ENCAPSULATED VIAL
Thomas A. Lindner, West Bend, and Joseph B. Coel, Waterford, both of Wis., assignors to Empire Level Mfg. Co., Milwaukee, Wis.
Filed Mar. 1, 1995, Ser. No. 397,430
Int. Cl.[6] G01C *9/24*
U.S. Cl. 33—379 **8 Claims**



1. A liquid vial assembly comprising:

a liquid-containing vial having a seamless cylindrical wall made of plastic material;

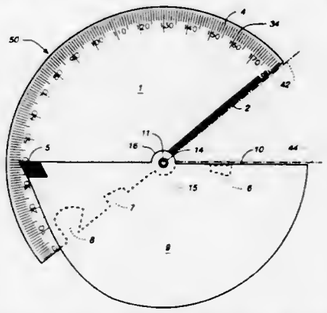
a generally-cylindrical transparent outer sleeve extending along the wall and being slightly stretched therearound, such sleeve being made of a resilient material selected from a group of materials including polyvinyl chloride and polyurethane;

and wherein:

substantially the entirety of the vial is visible through the sleeve; and

the sleeve has ends which are open and free of seals, whereby the resistance of the vial to breakage is improved.

5,588,218
TEACHING PROTRACTOR
David Barry, and Camilla Barry, both of 49 Lomita Dr., Mill Valley, Calif. 94941
Filed May 24, 1995, Ser. No. 449,489
Int. Cl.[6] G01B *5/24*
U.S. Cl. 33—471 **6 Claims**



1. A protractor device for measuring and drawing angles, comprising:

first and second generally flat members each defining a pivot point, each member having a straight edge portion extending generally radially from said pivot points,

said straight edge portions offset from a line extending radially from said pivot point by an amount greater than 0.1 mm and less than 1.5 mm,

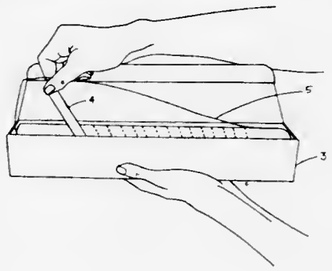
a means for rotatably attaching the two generally flat members such that the straight edge portions define an angle,

said first member further defining a semi-circular portion having a center coincident with the pivot point,

angle indicia located on said semi-circular edge portion, and

an indicator portion on the second member which intersects the angle indicia of the first member enabling the angle defined by the two straight edge portions to be measured.

5,588,219
ROLLED SHEET MATERIAL HAVING RELEASABLE ANTI-TACK GUIDE STRIP
Jeffrey A. Seabrooks, 1316 Coronado Blvd., Reynoldsburg, Ohio 43068
Filed Aug. 18, 1994, Ser. No. 292,935
Int. Cl.[6] B65H *61/00*
U.S. Cl. 33—733 **6 Claims**



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1. A rolled sheet material having a guide strip, comprising:

a. a rolled sheet material having a lateral width, lateral sides, lateral edges and a longitudinal axis; and

b. a guide strip disposed along one said lateral side of said rolled sheet material, said guide strip being coiled in a spiral so as to be substantially uniformly distributed between said lateral edges of said rolled sheet material, said guide strip being adhered to said rolled sheet material by a releasable adhesive and being releasable from said rolled sheet material, and said guide strip having a lateral width less them said lateral width of said rolled sheet material.

5,588,220

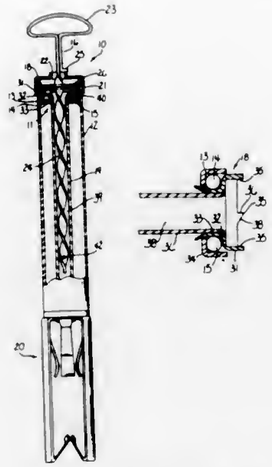
MEASURING TAPE DEVICE INCLUDING EXTERNAL CLEANING MEMBER

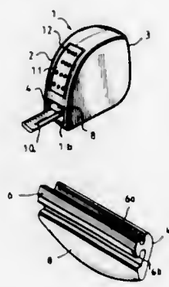
Michael Cousins, New York, N.Y.; Douglas Patrick, Lexington, Ky., and Carol T. Bassett, Patchogue, N.Y., assignors to U.S. Tape Company, Inc., Patchogue, N.Y.

Filed Feb. 28, 1994, Ser. No. 202,836

Int. Cl.[6] G01B *3/10*

U.S. Cl. 33—768 **4 Claims**





1. A container for a measuring tape, wherein the tape is wound around an internal spring and is arranged to be pulled from the container for a desired length of measurement, said container comprising:

a housing within which said tape is wound, said housing having an opening formed therein for allowing said tape to be pulled from the housing;

a flexible wiper flap located on an exterior surface of said housing so as to be located outside of said housing, said flexible wiper flap being urged against a surface of said measuring tape and said flexible wiper flap having a width and a length such that said flexible wiper flap and said measuring tape cover said opening to prevent dust and contaminants from entering the interior of the measuring tape container.

5,588,221

DRIVE DRIVE SHAFT FOR A PAINT BRUSH AND ROLLER COVER CLEANING MACHINE

Larry Hoeltke, Alden, and Roger Fischer, Lancaster, both of N.Y., assignors to Shur-Line, Inc., Lancaster, N.Y.

Filed Sep. 28, 1995, Ser. No. 535,719

Int. Cl.[6] F26B *17/24*

U.S. Cl. 34—58 **4 Claims**

1. A drive shaft assembly for a manually operated paint brush and roller cover cleaning machine designed to free said brush and said roller cover of paint by centrifugal spinning, having a drive rod having a uniformly twisted spiralling blade portion and a flange extending radially from said blade portion, and having a clutch disk generated about an axis comprising a body portion having an opening through which said clutch disk axis passes and arms projecting radially from said clutch disk body portion, said blade portion passing through said clutch disk opening and said clutch disk freely slidable on said blade portion, and having a wheel, and having a tubular shaft, and having a paint applicator holding device, said wheel and said tubular shaft providing a continuous bore through which said blade portions passes, and said clutch disk operatively arranged to impart rotation to said wheel, said tubular shaft and said paint applicator holding device as said clutch disk is rotated by said blade portion passing through said clutch disk opening, said improvement comprising:

a blank clutch disk generated about an axis having an opening through which said blank clutch disk axis passes, and said blank clutch disk freely slidable on said blade portion, and said blank clutch disk located along said blade portion on the side of said clutch disk closer to said flange, and said blank clutch disk opening sized to allow passage of said blade portion but not said flange;

whereby said blank clutch disk prevents the unintentional removal of said drive rod from said drive shaft assembly by precluding passage of said flange beyond said clutch disk.

5,588,222

PROCESS FOR RECYCLING COMBUSTION GASES IN A DRYING SYSTEM

Stanley P. Thompson, Topeka, Kans., assignor to Beloit Technologies, Inc., Beloit, Wis.

Filed Mar. 15, 1995, Ser. No. 404,589

Int. Cl.[6] F26B *7/00*

U.S. Cl. 34—379 **12 Claims**

1. A process for drying material in a drying system having a first stage dryer and at least two second stage dryers, the first and second stage dryers each having a combustion chamber coupled therewith, the process comprising:

supplying a quantity of heated gas to the first stage dryer from the combustion chamber coupled therewith;

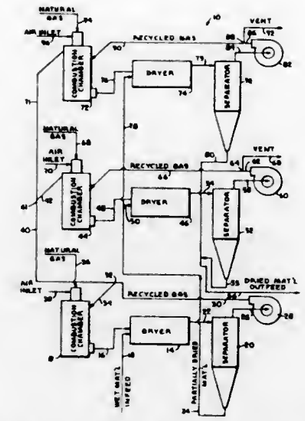
exposing material ton be dried to said quantity of heated gas in the first stage dryer;

separating dried material from said quantity of heated gas;

splitting said quantity of heated gas into a first stream of heated gas and a second stream of heated gas after dried material has been separated from said quantity of heated gas;

introducing said first stream into the combustion chamber coupled with the first stage dryer so that the gases generated in this combustion chamber and said first stream are combined to constitute said quantity of heated gas;

introducing at least a portion of said second stream into each combustion chamber coupled with a second stage dryer;



supplying each second stage dryer with a current of heated gas from the combustion chamber coupled therewith, said portion of said second stream constituting a portion of each said current;

exposing material to be dried to said current in a second stage dryer; and

separating dried material from said current.

5,588,223

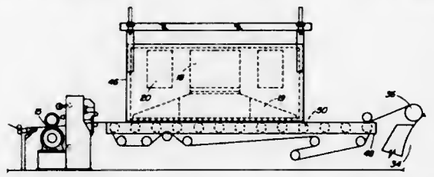
RESTRAINED PAPER DRYER

Hugh G. Marshall, Hudson, Canada, assignor to Asea Brown Boveri Inc., Quebec, Canada

Filed Jun. 14, 1994, Ser. No. 259,503

Int. Cl.[6] F26B *5/04*

U.S. Cl. 34—414 **14 Claims**



1. An improved method of drying a moving paper web in an elongated drying apparatus comprising the steps of:

a) holding the web in a restrained position on an open weave fabric by means of air suction from 3 to 12 inches H_2O imposed progressively along the length of the drying apparatus from underneath the web and sufficient to prevent shrinkage of the web; and

b) applying a drying medium to said web in the form of high temperature, high velocity air or superheated steam, whereby shrinkage of said web is substantially inhibited, ring crush strength is increased and fibre requirements are reduced.

5,588,224

CHILL ROLL ASSEMBLY

John S. Gianforte, Southlake, and Anthony C. Cox, Hurst, both of Tex., assignors to EGS Americas, Inc.

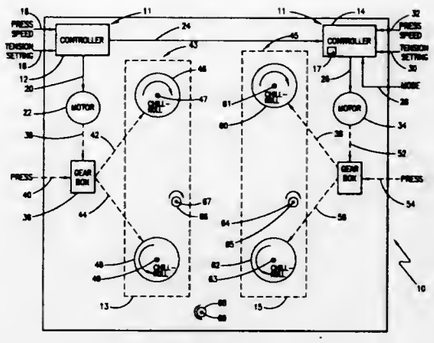
Filed Jun. 7, 1995, Ser. No. 488,381

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—447 **13 Claims**

1. A chill roll assembly, comprising:

a plurality of sets of chill rolls;



a plurality of means for driving said plurality of chill roll sets, each of said means for driving connected to actuate a corresponding set of chill rolls; and

means for controlling said plurality of means for driving said plurality of chill roll sets in a first mode to synchronously actuate said plurality of sets of chill rolls in processing a single web through said plurality of chill rolls sets or in a second mode to asynchronously actuate said plurality of chill roll sets in processing multiple webs, on a one web per set of chill rolls basis, through said plurality of chill roll sets.

5,588,225

METHOD OF DRYING AN INJECTION MOLDING TOOL

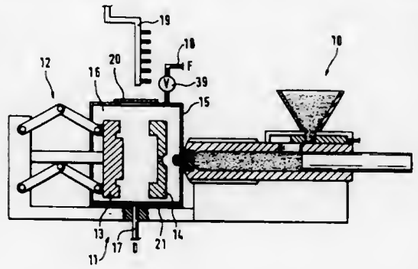
Achim Becker, Darmstadt, and Michael Zlotos, Biebesheim, both of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Jun. 30, 1995, Ser. No. 497,329

Claims priority, application Germany, Jun. 30, 1994, 44 22 674.8

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—474 **13 Claims**



1. A method of drying a surface of an injection molding tool comprising the steps of:

feeding dry air from a drying device into a lower area of a chamber defined by a housing enclosing the tool;

removing moist air from an upper area of the chamber; and

returning said moist air to said drying device which removes moisture from the moist air.

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5,588,226

UNIDIRECTIONAL AIR TRANSFER SYSTEM FOR SHOES

Décio L. Schenkel, Rua Gal. Emílio Lúcio Esteves, 1353-Taguara/RS, Brazil

Filed May 1, 1995, Ser. No. 431,721
Claims priority, application Brazil, Feb. 17, 1995, 9500679
Int. Cl.[6] A43B *7/08*
U.S. Cl. 36—3 B **8 Claims**

1. A shoe comprising

an outsole with openings formed therethrough;

an assembly inner-sole with openings formed therethrough; and

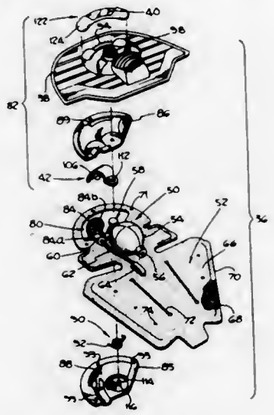
a unidirectional air transfer set disposed between said outsole and said inner-sole and including tissues separated by a breathable membrane permitting passage of humid air in one direction only, said unidirectional air transfer set being interposed between said openings in said inner-sole and said openings in said outer-sole to permit humid air to pass through said breathable membrane and tissues in one direction only from an interior of said shoe to an exterior of said shoe.

5,588,227

ATHLETIC SHOE HAVING AIR BLADDER PRESSURE INDICATING MEANS

Mark R. Goldston, Los Angeles, Calif.; Jon L. Bemis, Middleboro, Mass.; Daniel M. Wickemeyer, and David Potter, both of Venice, Calif., assignors to L.A. Gear, Inc., Santa Monica, Calif.

PCT No. PCT/US92/03593, § 371 Date Apr. 30, 1992, § 102(e) Date Apr. 30, 1992
PCT Filed Apr. 30, 1992, Ser. No. 849,433
Int. Cl.[6] A43B *7/14;13/20;23/26*
U.S. Cl. 36—93 **16 Claims**



1. An athletic shoe having a sole, an upper, and a tongue, wherein the athletic shoe comprises:

bladder means for altering the fit of the athletic shoe, said bladder means being inflatable and incorporated into the construction of the athletic shoe;

pump means for inflating said bladder means;

pressure sensing means for sensing the pressure within said bladder means, said pressure sensing means including an arcuately expanding bellows having a plurality of pleats formed therein; and

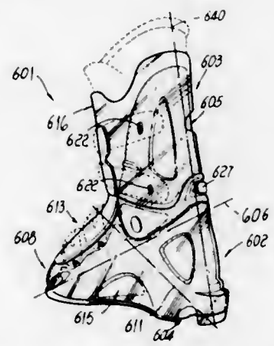
indicator means, responsive to movement of said bellows, for indicating the pressure sensed by said pressure sensing means.

5,588,228

SPORTS SHOE WITH A REINFORCING SHELL-FRAME

Giancarlo Foscaro, Treviso; Mirco Tesser, Montebelluna; Mirco Battistella, Spresiano; Mirco Bergamin, Castelfranco, and Gilberto Canil, Noale, all of Italy, assignors to Nordica S.p.A., Trevignano, Italy

Filed Aug. 29, 1994, Ser. No. 297,277
Claims priority, application Italy, Sep. 10, 1993, TV93A0080; May 23, 1994, TV94A0057
Int. Cl.[6] A43B *7/20;5/04;5/16*
U.S. Cl. 36—118.2 **47 Claims**



17. A sports shoe having a heel region, a region lying above the heel region, a tip region, a foot instep region, a foot inner side region, and a foot outer side region, the sports shoe comprising:

a sole having a resting surface;

a shell connected to the sole;

a shell rigid reinforcing frame; and

a shell soft portion connected to said shell rigid reinforcing frame for forming said shell, said shell soft portion being relatively less rigid than said shell rigid reinforcing frame;

said reinforcing frame comprising bands of plastic material extending at least along a first inclined directrix and a second inclined directrix such that open regions are defined in said shell reinforcing frame, in which said first inclined directrix extends at least at one of the foot inner side region and the foot outer side region from the tip region towards the region lying above the heel region and such that said first inclined directrix is inclined with respect to the extension of said sole, and in which said second inclined directrix also extends at least at said one of the foot inner side region and the foot outer side region from the heel region towards the foot instep region and such that said second inclined directrix is inclined with respect to the extension of said sole;

the bands of plastics material of said reinforcing frame which extend along said first directrix and said second directrix being mutually connected at an intersection point of said first and second directrices; and

said open regions of said shell reinforcing frame comprising at least

a first region arranged at least at said one of the foot inner side region and the foot outer side region laterally and adjacent to the region lying above the heel region; and

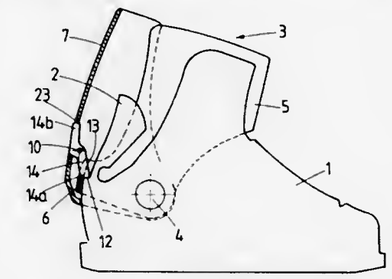
a second region arranged at least at said one of the foot inner side region and the foot outer side region in a median zone between the tip region and the heel region and just above said sole.

5,588,229

SKI BOOT

Gilles Marmonier, Saint Etienne de Crossey, France, assignor to Lange International S.A., Fribourg, Switzerland

Continuation of Ser. No. 205,581, Mar. 3, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 605,453
Claims priority, application Switzerland, Apr. 2, 1993, 01026/93
Int. Cl.[6] A43B *5/04*
U.S. Cl. 36—118.9 **5 Claims**



1. A ski boot having a front and a back end for a skier's foot, heel and leg, comprising: a rear having a shell (**1**) intended to surround the foot and the heel, a shaft (**3**; **3'**) having a closed position and being articulated on the shell and being comprised of two parts, namely a first part (**5**; **15**; **25**) forming a stirrup (**6**; **16**; **19**) having an upper edge and extending around and above the heel and a second part having a rear end (**7**, **18**) surrounding at least the rear of the leg, these two parts being able to be fixed to each other with respect to rotation by connecting means, at least in the closed position of the shaft, wherein the said connecting means consist of a rocker (**9**; **14**; **17**; **22**) having an axis and end and being articulated on the rear of the second part of the shaft so as to be able to bear on and engage the stirrup, said rocker including at least one beak movable to a

(1) first position wherein said beak bears and engages the stirrup and maintains the stirrup integral in backwards rotation with said second part, whereby rotation of the second part relative to the first part is prevented to define the closed position of the shaft and

(2) a second position wherein said beak is disengaged from the stirrup and said second part can rotate backwards independently from the stirrup, whereby the second part is adapted to tilt backwards to formulate putting on and removal of the boot.

5,588,230

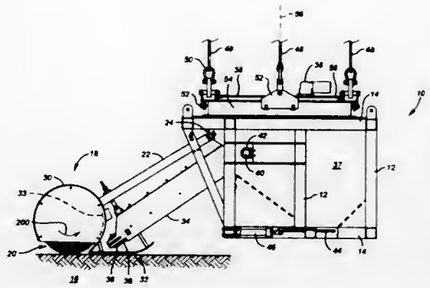
APPARATUS FOR EXCAVATING SOIL USING A PLURALITY OF INDEPENDENITY PIVOTABLE BRUSHES

William R. Bath, and Charles R. Yemington, both of Houston, Tex., assignors to Sonsub, Inc., Houston, Tex.

Filed May 31, 1995, Ser. No. 455,848
Int. Cl.[6] E02F *3/24*
U.S. Cl. 37—190 **14 Claims**

1. An apparatus for removing soil comprising:

a frame;



a collection box supported within said frame;

means for sweeping soil pivotally attached to said frame, said sweeping means comprising a plurality of brushes rotatably mounted and each said brush mounted for independent vertical positioning; and

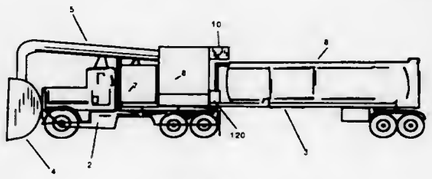
means for conveying the soil from said sweeping means into said collection box.

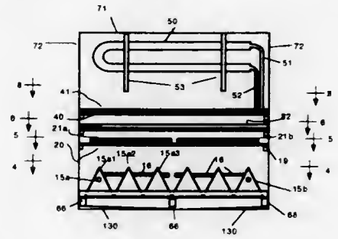
5,588,231

SELF CONTAINED SNOW REMOVAL APPARATUS AND METHOD OF USE THEREFORE

Kostas Mavrianos, P.O. Box 954, Nome, Ak. 99762

Filed Jul. 10, 1995, Ser. No. 500,182
Int. Cl.[6] E01H *5/10*
U.S. Cl. 37—227 **11 Claims**





1. A snow removal system comprising:

a) a means for collecting snow from a ground surface;

b) a hopper, having a front wall, a rear wall, two oppositely disposed sides and a floor;

c) at least one boiler in thermal communication with said means for melting snow;

d) a means for transferring said snow from the means for collecting snow, to said hopper;

e) a means for melting snow, fixedly placed within said hopper, said means for melting snow including: i) a plurality of elongated pyramids being hydraulically interconnected and also being connected to said boiler to allow a flow of heated water therethrough;

f) a means for collecting melted snow, fixedly placed within said hopper;

g) a container for receiving and storing the melted snow;

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h) a heating pipe, fixedly mounted to the rear wall of said hopper, above said screen to melt snow accumulating on said rear wall of said hopper; and

i) a means for pumping said melted snow from said hopper to said container for receiving and storing said melted snow.

5,588,232

VEHICLE LINKAGE

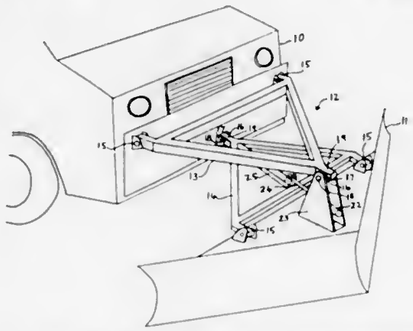
Peter J. Renwick, Hexham, England, assignor to Pearson Engineering Limited, Newcastle-on-Tyne, England

Filed Sep. 1, 1994, Ser. No. 299,576

Claims priority, application United Kingdom, Sep. 4, 1993, 9318392

Int. Cl.[6] E01H *5/04*

U.S. Cl. 37—232 **19 Claims**



1. A linkage for coupling a vehicle to a ground-engaging implement to allow said ground-engaging implement to be lifted and tilted, said linkage comprising a first link and a second link, each said link having a first end and a second end and a longitudinal axis passing through the first and second ends of each said link, said first end of said first link being pivotally connected to the vehicle to allow pivotal movement between the vehicle and the first end of said first link both around said longitudinal axis of said first link and around a line transverse to said longitudinal axis of said first link, and said second end of said first link being pivotally connected to the ground-engaging implement to allow pivotal movement between the ground-engaging implement and the second end of said first link only around a line transverse to said longitudinal axis of said first link; said first end of said second link being pivotally connected to the vehicle to allow pivotal movement between the vehicle and the first end of said second link only around a line transverse to said longitudinal axis of said second link and said second end of said second link being pivotally connected to the ground-engaging implement to allow pivotal movement between the ground-engaging implement and the second end of said second link around said longitudinal axis of said second link and also around a line transverse to said longitudinal axis of said second link.

5,588,233

PAPER PRODUCT AND METHOD OF MAKING

Carolyn K. Volkert, Evanston, and Andrew M. Volkert, Northfield, both of Ill., assignors to Volkert, Inc., Northfield, Ill.

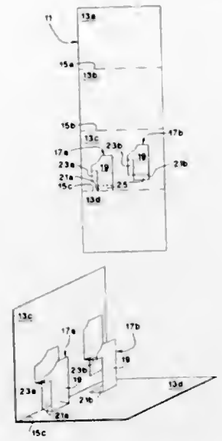
Filed Aug. 5, 1994, Ser. No. 286,674

Int. Cl.[6] G09F *3/00*

U.S. Cl. 40—124.1 **20 Claims**

1. A blank for fabricating an attention-attracting piece, said blank comprising

sheet material designed to be formed into at least first and second panels connected to each other along a main hinge line,



die-cut means in said first panel forming a stand-out structure having a main body portion,

at least one line of weakness in said blank along which said main body portion is hinged to the remainder of said blank,

said die-cut means also forming link means in said sheet material as a part of said stand-out structure, said link means being hinged to said main body portion of said stand-out structure, and

bonding means for interconnecting said stand-out structure in said first panel to a region of said second panel of said sheet material which lies across said main hinge line from said first panel,

so that interconnection between said stand-out structure and said second panel occurs upon manipulation of said sheet material to achieve superimposition of one said panel upon said other panel, thereby completing said fabricated piece whereby opening of said fabricated piece thereafter causes said stand-out structure to move prominently away from the remainder of said first panel in an attention-attracting mode.

5,588,234

FRAUD-RESISTANT ELECTRONIC IDENTIFICATION DEVICE

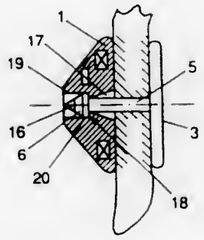
Hendrik J. de Jong, Groenlo, and Ebele M. Postma, Nijmegen, both of Netherlands, assignors to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed Sep. 21, 1993, Ser. No. 123,967

Claims priority, application Netherlands, Sep. 21, 1992, 9201626; Feb. 16, 1993, 9300289

Int. Cl.[6] G09F *3/00*

U.S. Cl. 40—301 **32 Claims**



1. A device for identifying animals or articles, said device comprising.

an identification member including an identification device located internally of said identification member with an electronic identification circuit storing a code and enabling automatic remote detection of the code of the identification device,

said identification member being made of hard, non-resilient material and an external shape of said identification member being frustoconical, starting from a base which in operation abuts against the article or the animal, narrows substantially taperingly and smoothly to an end which in operation is located remote from the article or animal, so that said identification member cannot be gripped by another animal between its teeth or be caught on obstacles or other objects,

an attachment member for attaching said identification member to the article or animal, said attachment member being resilient and deformable upon contact with said identification member,

a bore of said identification member extending between said base and said end and transversely to the base, and

retaining means located in said bore for receiving a pin-shaped element of said attachment member.

5,588,235

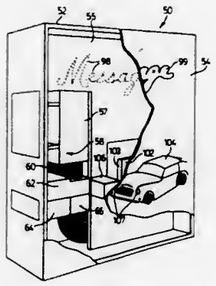
LIGHT PROCESSING APPARATUS FOR CREATING VISUAL EFFECTS

Victor Y. Juchymenko, Toronto; J. Richard Howard, Oakville; Andrew J. Laczynski, and James S. Angus, both of Toronto, all of Canada, assignors to Roberts Systems, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 79,585, Jun. 22, 1993, Pat. No. 5,508,892. This application May 31, 1994, Ser. No. 252,007

Int. Cl.[6] G09F *13/04*

U.S. Cl. 40—547 **17 Claims**



1. Light processing apparatus for creating on a display surface special effects which simulate movement, using light from a light source, comprising:

(a) a multiplicity of flexible fibre optic light guides having input ends for receiving the light from the light source and output ends, the light guides being grouped into groups, each group creating a particular special effect, wherein the input ends of each group of light guides are placed in distinct receptor zones which define a pre-selected geometry and the output ends of each group of light guides are positioned in a pre-selected pattern; and

(b) a moveable color changing means for periodically changing the color of the light from the light source, comprising a plurality of discrete colored filter zones which transmit light of various colors, wherein each of the filter zones defines a preselected geometry which is substantially the same width and geometric pattern as said receptor zone wherein the filter zones successively register with and sweep across the correlated receptor zones, thereby periodically changing the color of the light which is transmitted to the input ends of various groups of light guides.

5,588,236

VISUAL PANEL

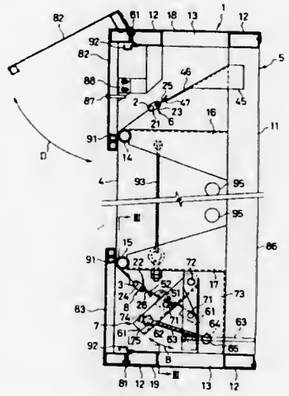
Teruo Suzuki, Urayasu, Japan, assignor to SCS Promotion Company Limited, Chiba, Japan

Continuation-in-part of Ser. No. 039,070, Apr. 8, 1993, Pat. No. 5,398,436. This application Dec. 16, 1994, Ser. No. 357,326

Claims priority, application Japan, Oct. 25, 1991, 3-306627

Int. Cl.[6] G09F *13/00;17/00*

U.S. Cl. 40—558 **2 Claims**



1. A visual panel comprising:

a frame;

a flexible sheet having swollen portions at opposing edge portions thereof, respectively;

sheet stretching means for slidably accommodating said swollen portions at said opposing edge portions of said sheet and for stretching said sheet over said frame; and

tension adjusting means for adjusting a tension to be applied to said sheet;

said stretching means comprising a first stretching device for accommodating one of said swollen portion portions at one edge portion of said sheet and a second stretching device for accommodating another of said swollen portions at the other edge portion of said sheet;

said first stretching device and said second stretching device each being provided with a hole for accommodating said swollen portions at said edge portions, respectively, of said sheet and a slit through which said edge portion of said sheet continuing to said swollen portion is extended,

said second stretching device being disposed movably with respect to said frame,

said tension adjusting means comprising a rotatable arm rotatably mounted on said frame by means of a pivotal pin, a screw having one end rotatably and pivotally connected to said rotatable arm, and a nut member threadedly fitted to a screw portion of said screw and rotatably mounted on said frame,

said tension adjusting means being provided between said second stretching device and said frame.

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SYSTEM FOR MOUNTING BILLBOARDS

Jeffrey A. Chase, 1388 Keenan Way, San Jose, Calif. 95125, and Joseph L. Chase, 1159 Chippewah Dr., Chattanooga, Tenn. 37412

Filed Jan. 18, 1994, Ser. No. 183,035

Int. Cl.[6] G09F *21/04*

U.S. Cl. 40—597 **4 Claims**

1. An apparatus for temporarily displaying a sign from an exterior surface of a vehicle, the apparatus comprising:

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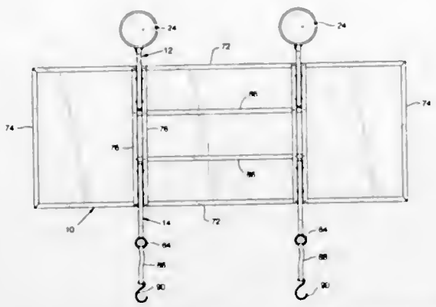


a frame configured for holding a sign, the frame including an upper portion and a generally rectangular portion configured for housing the sign;

a hook mounted to the upper portion of the frame;

a plurality of vacuum cups, each having an open end for positioning against the surface;

hook receiving means mounted to at least one of the cups for detachably engaging with the hook;

vacuum means for removing air from the vacuum cups when the open ends are positioned against the exterior surface of the vehicle to create a substantially airtight seal between the cups and the exterior surface of the vehicle; and

stabilizing means for stabilizing a lower portion of the frame against the exterior surface of the vehicle;

and wherein the frame further comprises a plurality of upper support members extending from an upper portion of the rectangular portion, the upper support members detachably connected to the vacuum cups and adjustable to accommodate vehicles of varying sizes.

5,588,238

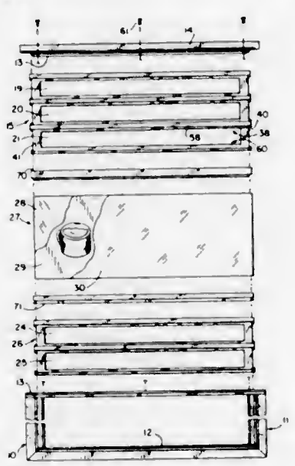
SIGN COMPRISED OF A CARRIER FRAME AND MANUALLY ARRANGEABLE MODULAR INFORMATION GRIDS AND PICTORIALS

Joseph E. Visocky, Racine, and Everett Evans, Hales Corners, both of Wis., assignors to Everbrite, Inc., Greenfield, Wis.

Filed Jun. 14, 1995, Ser. No. 490,470

Int. Cl.[6] G09F *7/02*

U.S. Cl. 40—618 **8 Claims**



1. A sign system comprising:

a carrier frame including longitudinally extending side rail members that have nominally upper and lower end portions and are laterally spaced from and parallel to each other, upper and lower cross rail members extending laterally between the side rail members and each cross rail member having opposite ends, the opposite ends of the upper cross rail member joined with the upper end portions, respectively, of the side rail members and the opposite ends of the lower cross rail member joined with the lower end portions, respectively, of the side rail members to thereby define a rigid carrier frame, said side rail members having guide tracks substantially coextensive with the length of the side rail members,

at least one grid unit comprised of at least one grid module including upper and lower laterally extending parallel longitudinally spaced apart cross bars having opposite corresponding ends and laterally spaced apart longitudinally extending tie bars at each end rigidly connecting corresponding ends of the cross bars to thereby define a window opening, and

said ends of the cross bars for each grid module are configured for engaging with said guide tracks at said upper ends of the side rail members to provide for sliding said grid unit in the carrier frame for being retained between the side rail members and,

upper and lower pictorial assembly retainer bars each having opposite end portions configured for sliding on said tracks of said side rail members into the carrier frame for being arranged in longitudinal spaced apart relationship,

the upper retainer bar having a downwardly presented slot and the lower retainer bar having an upwardly presented slot, and,

a pictorial assembly comprised of front and rear light transmissive panels and a transparency panel disposed between said panels, said panels having corresponding upper edges of registering in the slot of the upper retainer bar and having corresponding lower edges for registering in the slot of the lower retainer bar for holding the pictorial assembly in the carrier frame.

5,588,239

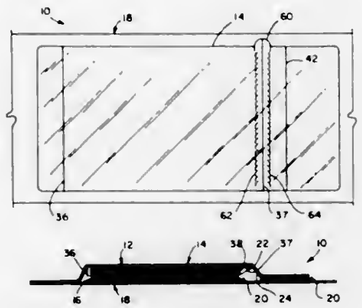
EXPANDED CONTENT LABEL ADAPTED FOR APPLICATION TO CURVED SURFACES

Robert J. Anderson, Sioux Falls, S. Dak., assignor to CCL Label, Inc., Sioux Falls, S. Dak.

Filed Feb. 13, 1995, Ser. No. 387,067

Int. Cl.[6] G09F *3/02*

U.S. Cl. 40—630 **11 Claims**



1. An expanded content label comprising:

a base label having first and second unconnected base label segments, each of said segments having upper and lower surfaces, said first segment having longitudinally opposed inner and outer side edges, said inner side edge facing said second segment;

adhesive on said lower surface of each of said segments;

a booklet including longitudinally opposed bound and free edges, said booklet including a bottom sheet secured to said upper surface of said first base label segment and not to said second base label segment, said booklet oriented with said bound edge toward said outer side edge and said free edge toward said inner side edge; and

an overlaminate adhered both to said booklet and to said second base label segment, said overlaminate including a perforation means for providing access to said booklet, said perforation means located proximate said free edge of said booklet.

5,588,240

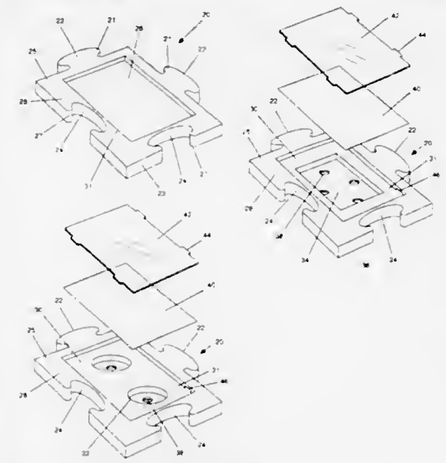
INTERLOCKING PICTURE FRAME

Kent Zilliox, 361 Halsey Ave., San Jose, Calif. 95128

Filed Mar. 18, 1994, Ser. No. 215,094

Int. Cl.[6] G09F *1/12*

U.S. Cl. 40—729 **15 Claims**



1. A picture frame, comprising:

a first frame body, said first frame body having a perimeter, said first frame body having at least one connector, said connector being selected from the group consisting of a male connector and a female connector, said male connector being a projection from said perimeter of said first frame body, said female connector being an indent in said perimeter of said first frame body, said first frame body having a front surface,

and a display means for holding a display item for viewing, said display means comprises a first recess in said front surface for receiving said display item,

and wherein said first recess comprises a back surface and a second recess within said back surface, said second recess having a back wall, said second recess having at least one hole through said back wall.

2. The picture frame of claim 1 further comprising a transparent cover means for covering said display item received in said first recess.

5,588,241

HIGH CAPACITY CONVERSION MAGAZINE

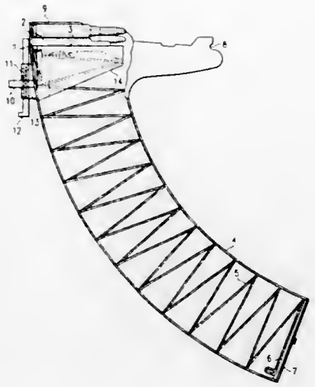
William W. Hurley, Temple Main Post Office, 401 N. Main, Temple, Tex. 76501

Filed Feb. 26, 1990, Ser. No. 484,239

Int. Cl.[6] F41A *9/65*

U.S. Cl. 42—50 **3 Claims**

1. A readily detachable, externally loadable, box magazine adapted to replace the original-equipment box magazine of a rifle, the original-equipment magazine having a "clam-shell" configuration utilizing a pair of magazine halves connected at a forward pivot site, the lower half being pivotable to allow the interior portions thereof to be accessed, the rifle having a stock with a



vertical through-hole adapted to be covered at its top by a barrel and receiver, covered at its rear underside by a trigger mechanism, and covered at its forward underside by said original-equipment magazine, the original equipment magazine being retained within the stock at its forward end at a fixed attachment site and at its rearward end by a spring-biased retaining latch on the trigger mechanism such that the original-equipment magazine may only be removed from the rifle after prior removal of the lower half of the original-equipment magazine to retain the original-equipment magazine in a closed configuration during use, the readily detachable magazine comprising:

a hollow body formed from front, side and back walls and adapted to house a plurality of cartridges, said hollow body having a top opening allowing cartridges to pass therethrough;

a spring and follower combination disposed within said hollow body to facilitate the extraction of cartridges from within said hollow body during use of the rifle;

an elongated extension section attached at one end to the front wall of said hollow body proximate the top thereof and projecting normally to and forward from said front wall to terminate in a free end having a forward latch projection disposed thereón for readily detachable engagement with the fixed attachment site of the rifle, said extension section substantially covering the underside portion of the through-hole forward of said hollow body when the readily detachable magazine is attached to the rifle; and

a rear latch projection attached to the rear wall of said hollow body projecting normally to and rearward therefrom, said rear latch projection being configured for readily detachable engagement with the spring-biased retaining latch of the rifle,

whereby the readily detachable magazine may be secured to the rifle by engaging the forward latch projection with the fixed attachment site and the rearward latch projection with the spring-biased retaining latch of the rifle, and the readily detachable magazine may be removed from the rifle by disengaging the forward latch projection from the fined attachment site and the spring-biased retaining latch of the rifle from the rear latch projection of the readily detachable magazine.

5,588,242

GUN BARREL CLEANING ROD AND METHOD

Jeffrey T. Hughes, Winston-Salem, N.C., assignor to Hughes Products Company, Inc., Thomasville, N.C.

Continuation of Ser. No. 391,765, Feb. 21, 1995, abandoned. This application Apr. 1, 1996, Ser. No. 625,095

Int. Cl.[6] F41A *29/00*

U.S. Cl. 42—95 **20 Claims**

1. A gun barrel cleaning rod comprising: a coilable, uniformly flexible, wholly polymeric shaft, and a cleaning implement, said cleaning implement affixed to said polymeric shaft, said polymeric

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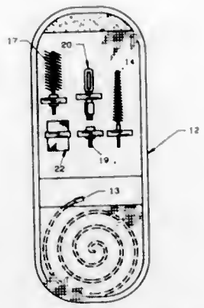
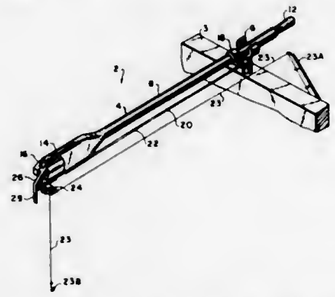


shaft having rigidity sufficient to overcome compression forces encountered while said cleaning implement is urged tightly through said gun barrel.

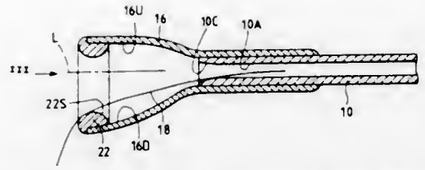
5,588,243
FISHING LINE DEVICE
Gregory Caldwell, 3701 Buttonwood La., Carmel, N.Y. 10512
Filed Apr. 6, 1995, Ser. No. 417,678
Int. Cl.[6] A01K *97/00*
U.S. Cl. 43—4 **2 Claims**



1. Apparatus for imparting an irregular jerking motion to a fishing line from a rowboat by releasably securing said fishing line to a downrigger clamp means located at the paddle portion end of an oar of said boat, said oar having a handle at one end and a paddle portion at the second end said apparatus comprising an attachment to said oar releasably secured to said paddle portion of said oar, a mounting bracket secured to said oar adjacent to said handle of said oar, a pulley arm holding a pulley line, said pulley arm extending from said attachment, said mounting bracket and said downrigger clamp means secured to said pulley line and crimp means on either side of said downrigger clamp means to secure said downrigger clamp means to said pulley line.

5,588,244
FISHING ROD WITH A PRE-INSERTED FISHING LINE GUIDE MEMBER
Masaru Akiba, and Tomoyoshi Tsurufuji, both of Saitama, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jul. 22, 1994, Ser. No. 277,315
Claims priority, application Japan, Jul. 30, 1993, 5-045854 U
Int. Cl.[6] A01K *87/04*
U.S. Cl. 43—24 **13 Claims**

1. A fishing line guide member for mounting on an end of a fishing rod pipe held generally horizontal during fishing, a fishline extends through the fishing line guide member into the fishing rod

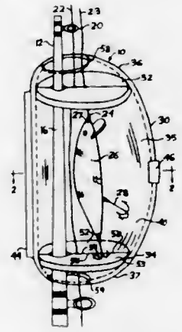


pipe and is generally pulled in a downward vertical direction during fishing, said line guide member comprising:

a forward portion engaging and mounted on the end of the fishing rod pipe;

a rearward portion connected to said forward portion, said rearward portion is in contact with and guides the fishing line into the rod pipe, said rearward portion being enlarged in diameter with respect to said forward portion, an end of said rearward portion opposite said forward portion defining a passage for the fishing line and including a periphery, said periphery being offset asymmetrically with respect to an axis passing longitudinally through said line guide member and the rod pipe.

5,588,245
FISHING LURE PROTECTIVE CONTAINER
Joseph E. Vance, 1113 Como Pl., St. Paul, Minn. 55103
Filed May 31, 1995, Ser. No. 454,829
Int. Cl.[6] A01K *97/06*
U.S. Cl. 43—25.2 **20 Claims**



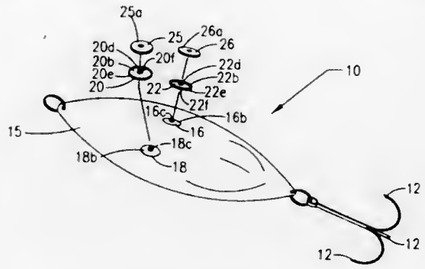
7. The combination of:

a fishing rod comprising an elongate rod shaft having guide rings mounted thereon with a fishing line threaded through said guide rings and terminating in a free end,

a fishing lure attached to said free end of said fishing line, and

a container comprising a relatively stiff longitudinal perimeter wall structure and spaced end walls transverse to said perimeter wall structure, said perimeter wall structure of said container being split longitudinally into two container parts hinged along a longitudinal axis to permit pivot opening and closure of the parts, said container being removably mounted in a longitudinal manner on said fishing rod by pivot closure of said container parts about said fishing rod shaft so as to form a protective fishing lure chamber within which said lure is held, said container being mountable on said fishing rod shaft with said rod shaft passing through said container so as to permit mounting of said container at various locations along said rod shaft, at least one of said transverse end walls of the container being formed of a deformable material such that said deformable end wall transversely pinches and deforms against said rod shaft in a frictionally engaging manner, said frictional engagement being such as to resist longitudinal slippage of said container along said rod shaft.

5,588,246
INTERCHANGEABLE EYES FOR FISHING LURES
Curtis J. Hill, 920-28th Ave. S., Moorhead, Minn. 56560
Filed Apr. 27, 1995, Ser. No. 429,664
Int. Cl.[6] A01K *85/00*
U.S. Cl. 43—42.06 **3 Claims**



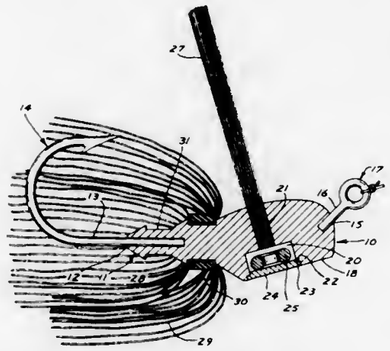
1. Interchangeable eyes for a fishing lure comprising:

eye fastening members secured in spaced relationship on a head of said fishing lure;

simulated eyes detachably attached to said eye fastening members, each of said simulated eyes having a simulated pupil protruding therefrom and a rim extending about the perimeter thereof, said pupil and rim defining an annular portion therebetween; and

spongy material removably retentive to each of said eye, for retaining and releasing fish-alluring scents into water to attract fish to said fishing lure, said spongy material being retentively received in said annular portion.

5,588,247
RATTLE JIG
John E. Wicht, 17515 Territorial Rd., Osseo, Minn. 55369
Filed Aug. 30, 1993, Ser. No. 113,185
Int. Cl.[6] A01K *91/00*
U.S. Cl. 43—42.31 **9 Claims**



1. A rattle jig for use in bass fishing which comprises:

A) a solid brass body of generally circular cross-section,

B) a forwardly extending integral body extension of lesser diameter,

C) a fish hook secured to the forwardmost end of said body extension, the shank of said fish hook being generally in alignment with the longitudinal axis of the body,

D) at least one annular channel in the surface of the body extension,

E) a transverse passage extending through said body, one end of said passage having a greater diameter than the other end, said larger diameter end of said passage constituting a rattle chamber,

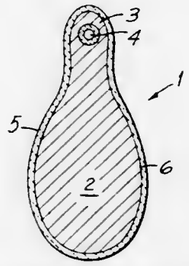
F) a cap closure covering the rattle chamber,

G) at least one noise-making rattle element loosely held within the rattle chamber,

H) a fiber weed guard secured to and extending radially outward from said body, spaced rearward of the barb of said fish hook, said fiber weed guard being composed of a bundle of stiff semi-rigid filaments adhesively sealed at one end within the smaller diameter end of the transverse passage, and

I) an eyelet secured to the rearward end of said body for attaching the jig to a fish line.

5,588,248
FISHING WEIGHT
Thomas W. Cornell, Jr., and John L. Reinbold, both of c/o C. R. Steel 377 41 St., Lindenhurst, N.Y. 11757
Continuation of Ser. No. 84,614, Jul. 1, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 420,583
Int. Cl.[6] A01K *97/02*
U.S. Cl. 43—44.9 **3 Claims**



1. A solid, non-hollow fishing weight, said fishing weight having a body portion, said body portion having a solid interior and an outer surface, the body portion having a central axis, the solid interior extending outwardly from said central axis, the exterior of said fishing weight being substantially symmetrical and being substantially devoid of any interruptions, the solid interior of said body portion being formed from a zinc alloy and having a protective coating covering the entire outer surface, said coating being non-corrosive when exposed to water, said protective coating being a powder coating having a thickness of between approximately 1.5 and 1.7 mm which has been electrostatically applied to the outer surface.

5,588,249
HUMANE RODENT TRAP
John Flinner, 104 Sundance Pass, Lafayette, La. 70508
Filed May 10, 1995, Ser. No. 438,392
Int. Cl.[6] A01M *23/20*
U.S. Cl. 43—61 **15 Claims**

1. A humane rodent trap, comprising:

(a) a outer housing comprised of a front wall, a rear wall, 24, 26 a pair of side walls, a bottom, and a top;

(b) a partition having an upper and a lower surface, horizontally disposed in said outer housing, whereby said partition internally divides said rodent trap into a upper compartment and a lower compartment;

(c) means for opening said top to a open-position and closing said top to a closed position;

(d) an inlet opening in a lower section of said front wall, whereby a rodent may enter said lower compartment of said rodent trap by passing through said inlet opening;

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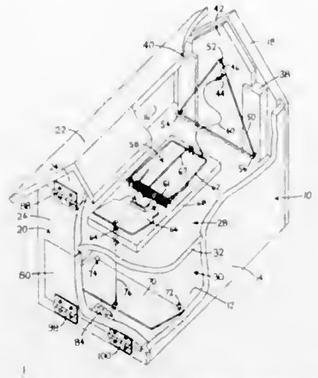


(e) a trap door which is vertically slidable between an upper and a lower position wherein said inlet opening is closed when said trap door is in said lower position and said inlet opening is open when said door is in said upper position;

(f) a tensioning means for urging said trap door towards said lower position;

(g) a mechanical intensifier having a stored energy device, a kinetic member, a trip mechanism, a release member, and a base, disposed on the upper surface of said partition;

(h) a release means for releasably engaging said trap door in said upper position and for releasing said trap door to move under the influence of said tensioning means when said trip mechanism is operated;

(i) a upper linkage connecting said release means to said kinetic member;

(j) a trigger mechanism pivotally disposed in said lower compartment;

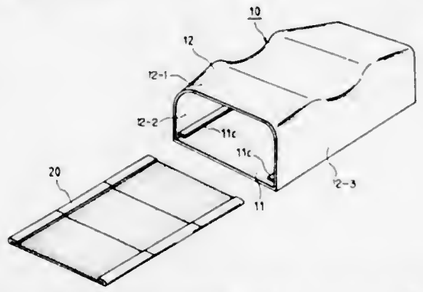
(k) a trigger linkage connecting said trip mechanism to a pivotably movable portion of said trigger mechanism.

5,588,250

ADHESIVE INSECT TRAPPING HOUSING

Hiromi Chiba, and Kenji Furumori, both of Osaka, Japan, assignors to Nitto Denko Corporation, and Oct Co. Ltd., both of Osaka, Japan

Filed Dec. 20, 1994, Ser. No. 360,003
Claims priority, application Japan, Dec. 20, 1993, 5-319448
Int. Cl.[6] A01M *1/14*
U.S. Cl. 43—114 **13 Claims**



1. An adhesive insect trapping housing, for trapping flying insects, utilizing an adhesive sheet disposed within said housing, comprising:

a hollow cover body defining a substantially rectangular opening extending in a longitudinal direction thereof, said cover body having at least three side walls, said side walls including a top side wall, and left and right side walls, a substantially middle portion of said top side wall being curved inwardly as compared to opposite longitudinal end portions of said top side wall, said inwardly curved middle portion extending from said left side wall to said right side wall;

an odorant member, disposed on the interior of said cover body, for attracting insects; and

a tray, disposed facing said top side of said cover body, onto which the adhesive sheet is mounted,

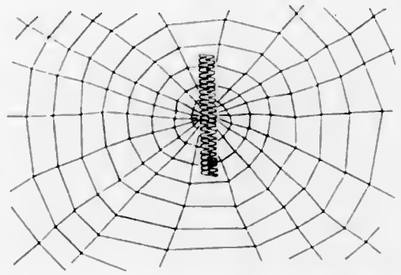
wherein a first distance from said tray to said inwardly curved middle portion of said top side wall is less than a second distance from said tray to said end portions of said top side wall such that said insects are directed toward said adhesive sheet.

5,588,251

DEVICE FOR THE PREVENTION OF COLLISIONS OF BIRDS WITH TRANSPARENT BARRIERS

Sam W. Young, 1203 White Rd., Opelika, Ala. 36801

Filed Feb. 10, 1995, Ser. No. 386,446
Int. Cl.[6] H01M *29/00*
U.S. Cl. 43—119 **10 Claims**



5. A device for deterring birds from colliding with a transparent window barrier, said device comprising:

a means for deterring birds from a transparent window barrier, said means for deterring birds comprising a substrate bearing the image of a spider stabilimentum and a center portion of a spider web, and said substrate having adhesive means on one surface thereof, wherein said substrate is adhesively attached to said transparent window barrier.

5,588,252

MOLE GASSING DEVICE

Jerry L. Jones, 14070 290th Ave., Zimmerman, Minn. 55398

Filed Jan. 29, 1996, Ser. No. 592,917
Int. Cl.[6] A01M *13/00*
U.S. Cl. 43—124 **4 Claims**

4. A mole gassing device utilizing gas exhaust fumes produced by a gasoline engine, comprising

gas fume conducting hose,

a terminal portion of said hose being fed through a sleeve,

an internal sleeve within said sleeve,

an annular flange as an extension of said internal sleeve supported upon said sleeve,

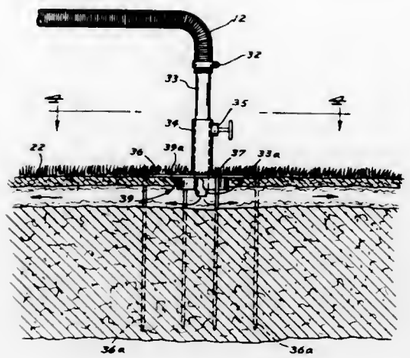
said internal sleeve frictionally receiving therethrough said terminal portion of said hose, positioning the extension therethrough of said sleeve,

means locking in position said hose within said sleeve,

a plate member underlying said sleeve being integral therewith,

said plate member having a plurality of depending ground engaging positioning rods,

a ground engaging cylindrical seal member depending from said plate member centrally thereof, and



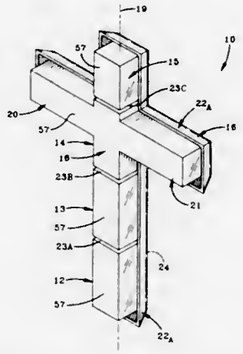
a terminal portion of said hose extending through said plate member centrally of said seal member into a mole passage.

5,588,253

METHOD AND APPARATUS FOR DISPLAYING FLORAL ARRANGEMENTS

James W. Boodley, Kent; James P. Noe, Seville, and Daniel Hann, Akron, all of Ohio, assignors to Smithers-Oasis Company, Cuyahoga Falls, Ohio

Filed May 29, 1992, Ser. No. 891,393
Int. Cl.[6] A01G *5/00;* **A47G** *7/00*
U.S. Cl. 47—41.12 **13 Claims**



1. A floral display support assembly comprising:

backing means;

floral foam bonded to said backing means to define a pre-shaped display configuration having a longitudinal axis;

said floral foam being an open-celled thermoset capable of absorbing moisture;

moisture barrier means oriented transversely of said longitudinal axis and separating said floral foam into adjacent segments;

said longitudinally adjacent segments being separated along said longitudinal axis by said moisture barrier means to prevent the formation of a bridging meniscus between successive, longitudinally disposed segments;

said segments having a dimension along said longitudinal axis that is no greater than will assure moisture retention within each segment by minimizing hydraulic head pressure and capillarity.

5,588,254

PLANT CULTIVATION METHOD

Takashi Adachi; Takafumi Ishii, and Hidemasa Hidaka, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 109,374, Oct. 19, 1987, abandoned. This application Aug. 22, 1990, Ser. No. 571,003
Claims priority, application Japan, Oct. 17, 1986, 61-245400; Mar. 3, 1987, 62-48385
Int. Cl.[6] A01H *1/00;* **A01N** *63/00;65/00*
U.S. Cl. 47—57.6 **6 Claims**

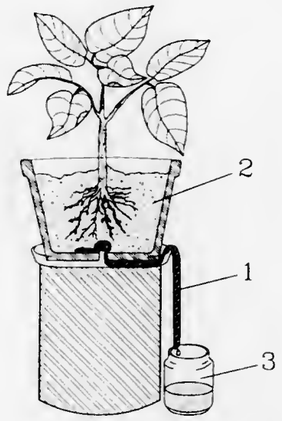
1. A method of accelerating growth of a plant which comprises applying to the plant, the seeds of the plant or the locus of the plant a plant growth accelerating amount of a plant growth accelerating oligosaccharide, wherein the plant growth accelerating oligosaccharide is alginic acid oligosaccharide, inulooligosaccharide, fucoidan oligosaccharide, gum arabic oligosaccharide or polyethylene glycol alginic acid oligosaccharide, wherein the oligosaccharide comprises 2 to 20 monosaccharides polymerized.

5,588,255

CAPILLARY WICK HYDROPONIC PROCESS

Christopher S. Johnson, 2679 B Walnut St., Los Alamos, N.M. 87544

Filed Jun. 14, 1995, Ser. No. 490,532
Int. Cl.[6] A01G *31/02*
U.S. Cl. 47—58 **2 Claims**



1. A green plant or microbial culture method involving the steps of:

1) providing a biological culture or support media which has a growing zone and a saturation zone, and

2) providing a watering means which will introduce water into said biological culture or support media and cause fluid to flow through said biological culture or support media towards said saturation zone, and

3) placing a capillary wick means in contact with said saturation zone in order to adsorb liquid solutions or suspensions which may contain metabolic products thereon while simultaneously or subsequently

4) applying an accelerating force such as gravity, liquid pump means, or centripetal force to said liquid for the purpose of recovering liquid water or to remove suspended or dissolved materials from the culture environment to a desired point of removal from the capillary wick means

5) where return flow of said liquid to said media by said wick means is substantially prevented, and where said plant or culture is supplied with nutrients from any supply means.

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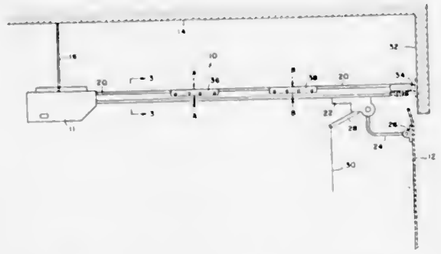
5,588,256
HYDROPONIC CULTIVATION APPARATUS AND METHOD
Charles O. Sherfield, 815 W. Marshall, Phoenix, Ariz. 85013
Division of Ser. No. 87,506, Jul. 2, 1993, Pat. No. 5,381,626, which is a continuation-in-part of Ser. No. 625,078, Dec. 10, 1990, Pat. No. 5,224,291. This application Apr. 20, 1995, Ser. No. 426,625
Int. Cl.[6] A01G *31/00*
U.S. Cl. 47—62 **21 Claims**

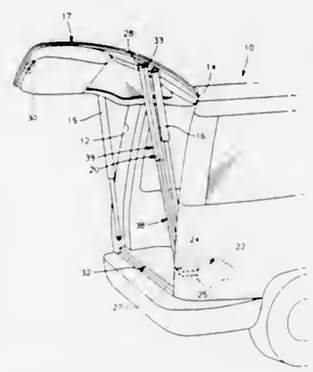
1. An apparatus for hydroponically cultivating a plant having roots and a stem and for retarding evaporation while protecting said plant roots, said apparatus comprising:
a container adapted to retain a nutrient solution, said container having an opening therein;
a seal coupled to a section of said container which immediately surrounds said opening, said seal having a hole therein, said hole being dimensioned for physical contact between said seal and said plant stem;
a porous support medium into which said plant roots grow, located within said container proximate said opening; and
a hollow tube being sufficiently long to contact said support medium while projecting outward from said container through said seal hole, said hollow tube being for retaining a plant seed in position relative to said seal hole and for guiding growth of said plant through said seal hole.

5,588,257
GARAGE DOOR OPERATOR
Dean C. Duhame, Roseville; Richard P. Spens, Howell; Dana Lowell, Clarkston, all of Mich.; Chin-Feng Chan, Nan Kang, and Ming-Hwa Shou, Hsin Tien, both of Taiwan, assignors to The Stanley Works, New Britain, Conn.
Filed Aug. 24, 1994, Ser. No. 295,272
Int. Cl.[6] E05F *11/00*
U.S. Cl. 49—199 **17 Claims**



1. An apparatus for operating a garage door including:
(a) a motor;
(b) a drive assembly coupled to said motor, said drive assembly comprising:
(i) a drive screw extending longitudinally and having a first end coupled to said motor for rotation, said drive screw including at least two drive segments;
(ii) coupling means for coupling ends of said segments; and
(iii) means for maintaining compression on said segments in a longitudinal direction toward said coupling means to maintain said segment ends in engagement with said coupling means; and
(c) means coupled to said door, responsive to rotation of said drive screw and moving therealong in said longitudinal direction for moving said door in response thereto.

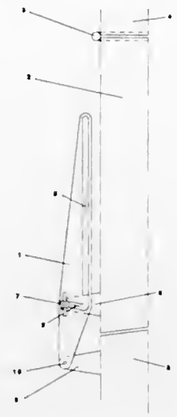
5,588,258
POWER OPERATOR FOR PIVOTABLE VEHICLE CLOSURE ELEMENT
Kevin Wright, Southfield; Lloyd W. Rogers, Jr., Shelby; Robert W. Baughman, Mt. Clemens, and David J. Chapman, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 1, 1995, Ser. No. 396,992
Int. Cl.[6] E05F *11/24*
U.S. Cl. 49—340 **8 Claims**



1. An operator in combination with a closure element of a vehicle comprising:
a power drive unit;
an extensible strut including a first and second link slidably engaging each other and connectable between the closure element and the vehicle;
a first drive cable connected between the power drive unit and the strut;
a sprocket rotatably fixed to the first link;
a connector fixed to the second link; and
a chain extending through the strut from the connector around the sprocket and connected to the first drive cable.

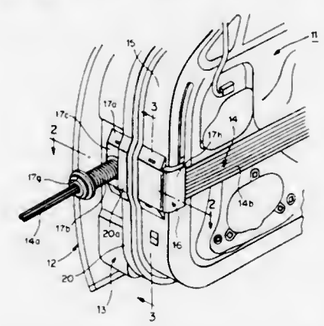
5,588,259
SUPPORTING ARM WITH LOCKING MEANS FOR A HINGED PANEL
Chris Kolefas, 1017 Edgewood La., Fort Lee, N.J. 07024
Filed Jul. 15, 1994, Ser. No. 276,098
Int. Cl.[6] E05B *65/06*
U.S. Cl. 49—394 **18 Claims**

1. A device used to support a hinged panel in an open position and to lock the hinged panel in a closed position, the hinged panel being hinged to a fixed structure, the device comprising:
a pivot point secured to the fixed structure;
a pin secured to the panel; and



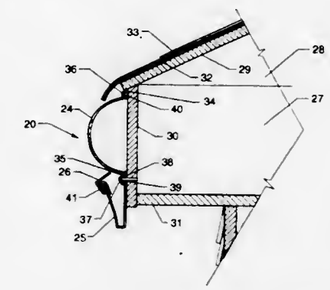
a movable arm pivotally attached at a first end to the pivot point and including a slot for receiving the pin therein, the slot having a first slot leg and a second slot leg connected with an end of the first slot leg, so that the panel is in a locked position when the pin is in the first slot leg and in an open position when the pin is in the second slot leg,
wherein the movable arm is substantially planar.

5,588,260
CONSTRUCTION OF A VEHICLE DOOR PROVIDED WITH A WIRING HARNESS AND A WATERPROOF GROMMET USED IN THE CONSTRUCTION
Shigemichi Suzuki, and Sadahisa Endo, both of Omiya, Japan, assignors to Kansei Corporation, Omiya, Japan
Filed May 30, 1995, Ser. No. 452,525
Claims priority, application Japan, May 30, 1994, 6-116352; Oct. 31, 1994, 6-266464; Mar. 17, 1995, 7-59313
Int. Cl.[6] B60J *5/04*
U.S. Cl. 49—502 **23 Claims**



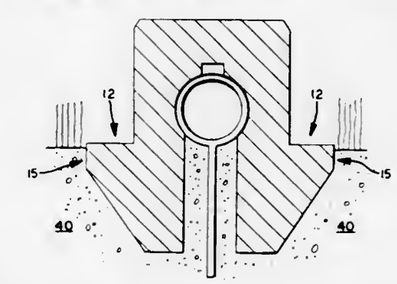
1. In a construction of a vehicle door provided with a wiring harness, comprising a door trim mounted on an interior surface of a door panel of a door with which an entry of a vehicle is closed; and a wiring harness inserted between said door trim and the interior surface of said door panel, bent along a side face of said door panel to which a door hinge is attached, and extended to a part of a vehicle body enclosing the door from the side face; said construction further comprising:
a waterproof grommet through which said harness passes, mounted on the side face;
said waterproof grommet being made of an elastic substance and having a grommet body and a fastening means for fastening said grommet body to the side face by pressing an edge of a mounting plate included in said grommet body against the side face, so that said harness is watertightly laid between said grommet body and the side face by said fastening means.

5,588,261
DISCRIMINATOR RAIN GUTTER SYSTEM
Ian O. MacConochie, 300 Old Landing Rd., Yorktown, Va. 23692
Filed Jun. 24, 1994, Ser. No. 265,127
Int. Cl.[6] E04D *13/00*
U.S. Cl. 52—11 **5 Claims**



1. A gutter assembly adapted to be attached to a fascia board located below a building roof, said gutter assembly comprising: a half-cylinder including an upper flange and a lower flange, each of said flanges extending radially outward from said half-cylinder and generally defining a single plane, said flanges adapted to be attached to said fascia board; a gutter defining a fluid receiving trough having a modified channel shape and being adapted to be mounted immediately below and adjacent to said half-cylinder on said fascia board such that fluid flowing off said building roof is directed over and around the half-cylinder and into said gutter.

5,588,262
LANDSCAPING BLOCK SYSTEM
William B. Dawson, Maple Grove, Minn., assignor to Keystone Retaining Wall Systems, Inc., Bloomington, Minn.
Filed May 19, 1994, Ser. No. 246,256
Int. Cl.[6] E02D *17/00*
U.S. Cl. 52—102 **12 Claims**



6. A landscaping system comprising:
(a) a landscaping block anchor, the landscaping block anchor partially embedded in a substrate having an upper surface,
(b) one or more landscaping blocks, each of the blocks comprising a top and a generally opposed bottom, first and second generally opposed sides, each side extending from the top to

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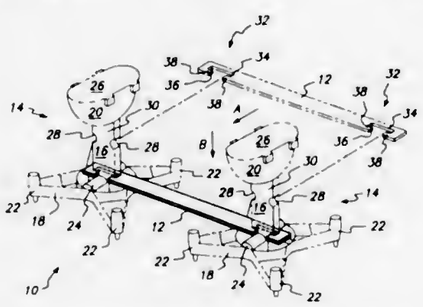
the bottom, the first side of each block comprising a first upper face extending from the top downward to an inner edge of a first lip, the first lip extending outward from the first upper face to an outer edge of the first lip for alignment of the outer edge of the first lip with the upper surface of the substrate when the block is inserted in the substrate, and a first lower face extending from the outer edge of the first lip to the bottom, and the second side of each block comprising a second upper face extending from the top downward to an inner edge of a second lip, the second lip extending outward from the second upper face to an outer edge of the second lip for alignment of the outer edge of the second lip with the upper surface of the substrate when the block is inserted into the substrate, and a second lower face extending from the outer edge of, first and second generally opposed ends, each end extending from the top to the bottom and from the first side to the second side, the bottom comprising an anchor coupler, wherein each block is coupled with the landscaping block anchor by the anchor coupler receiving the landscaping block anchor.

5,588,263

DOUBLE ADAPTOR BAR FOR SINGLE INSERTS USED IN CASTING CONCRETE

David L. Kelly, Sacramento, Calif., and Sidney E. Francies, III, San Antonio, Tex., assignors to HEM Trading, Long Beach, Calif.

Filed Sep. 21, 1994, Ser. No. 309,808
Int. Cl.[6] E04G *21/14*
U.S. Cl. 52—125.4 **10 Claims**



1. An anchor assembly interconnecting two anchors provided for embedment in a concrete tilt-up wall section, comprising:

at least two anchors, each having a body with whole and narrowed cross-sections, and

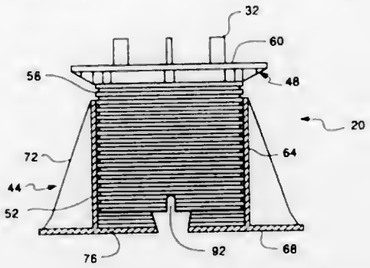
an elongated adaptor bar including first and second cutouts, each cutout being complementary in shape to the whole cross-section of the anchors and having a narrowed connecting passage extending the cutout through an adjacent edge of the elongated adaptor bar, each narrowed connecting passage having a width corresponding to the narrowed cross-section of the anchors to allow the narrowed cross-section to pass therethrough into the cutout, the cutout longitudinally movable along the anchor to the whole cross-section for securely engaging it within the cutout, thereby allowing the anchor to be retained at each end of the elongated adaptor bar for releasable interconnection in a spaced relationship.

5,588,264

METHOD AND APPARATUS FOR SUPPORTING A BUILDING SURFACE

Claude Buzon, 2 Place Licourt, 4040 Herstal, Belgium

Filed Feb. 17, 1995, Ser. No. 390,851
Int. Cl.[6] B66F *3/10;* **E04F** *15/024*
U.S. Cl. 52—126.6 **6 Claims**



5. An apparatus for supporting a platform which may be exposed to fluids, comprising:

a support member having a support surface to engage the platform having a first threaded surface and a first fluid pathway having an input on the support surface for removing fluids from the support surface;

a base member having a second threaded surface for engaging the first threaded surface and a second fluid pathway in communication with the first fluid pathway and having a plurality of outlets in the base member for transporting fluids radially outward from said base and support members into the exterior environment, wherein said base member includes contacting portions that contact a fixed surface on which said base member is supported and in which the support surface is elevated by rotating said contacting portions of said base member relative to said support member; and

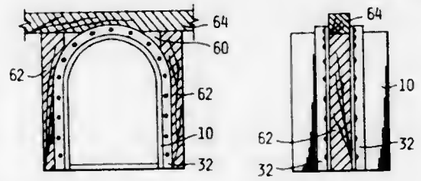
means for indicating provided with at least one of said support member and said base member, said means for indicating including an indicator slot formed in one of said first threaded surface and said second threaded surface with said indicator slot extending for a predetermined number of threads and with said indicator slot being movable when said contacting portions of said base member rotate relative to said support member.

5,588,265

EARTHQUAKE PROTECTIVE STRUCTURE

Danny A. Gill, 1428 Mt. Pleasant St., Los Angles, Calif. 90042

Filed Aug. 26, 1994, Ser. No. 297,264
Int. Cl.[6] E04H *9/00*
U.S. Cl. 52—167.1 **9 Claims**



1. An earthquake protective structure attached to one of a door jamb or other portal of a building comprising:

a) a first side section having an upper end, a lower end, an inward surface, an outward surface, a front end and a rear end,

b) a second side section having an upper end, a lower end, an inward surface, an outward surface, a front end and a rear end,

c) an upper section having a first side end, a second side end, an inward surface, an outward surface, a front end and a rear end,

where the first side end is attached by an attachment means, to the upper end of said first side section and the second side end is attached by an attachment means to the upper end of said second side section,

d) at least two angle iron supports each having a first leg and a second leg, where said supports are spaced around the outer surface of said upper section and said first and second side sections with the first leg attached to said structure by an attachment means and said second leg surrounding said first and second side sections and said upper section having a multiplicity of bolt bores therethrough where into each of said bolt bores is inserted a threaded bolt that is threaded into said door jamb portal of a building, and

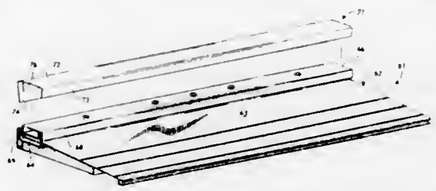
e) a base plate having first side end and a second side end where the first side end is attached by an attachment means to the lower end of the first side section, and the second side end is attached by an attachment means, to the lower end of said second side section, where said attached structure is sized to allow at least one person to stand under said structure to protect a person from falling debris resulting from an earthquake.

5,588,266

CONTINUOUS SIDELIGHT SILL WITH ADAPTABLE THRESHOLD CAPS AND REMOVABLE PAINT SHIELD

J. Charles Headrick, 5775 Bethelview Rd., Cumming, Ga. 30130

Continuation-in-part of Ser. No. 160,975, Dec. 3, 1993, which is a continuation-in-part of Ser. No. 5,621, Mar. 8, 1993. This application May 16, 1994, Ser. No. 243,259
Int. Cl.[6] B05C *21/00;* **E06B** *1/70*
U.S. Cl. 52—204.1 **8 Claims**



1. A threshold and door sill assembly with removable paint shield, said assembly comprising:

an elongated frame member having an outside edge portion and an inside edge portion, said member being formed with a longitudinally extending upwardly open channel adjacent and extending along said inside edge portion and a will shaped to provide a surface that extends laterally and slopes downwardly from said channel to a forward lip at the outside edge portion of said frame member;

an elongated threshold cap sized and configured to be received and supported within said upwardly open channel, said threshold cap having an upper surface, a forward surface, and a rear surface;

said threshold cap being disposed and supported in said upwardly open channel with its upper surface projecting from the channel;

an elongated protective cover having to top with a forward edge portion and a rear edge portion, said protective cover being shaped and sized to fit onto said elongated frame member with the top of said protective cover spanning and covering at least said upper surface of said threshold cap within said upwardly open channel;

means for releasably securing said protective cover to said threshold and door sill assembly to protect at least said threshold cap from damage during construction of a building in which said assembly is installed;

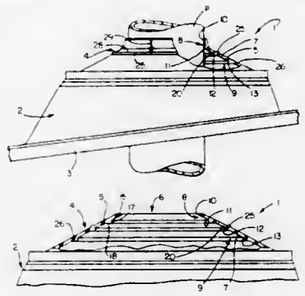
said means for releasably securing said protective cover to said threshold and door sill assembly comprising a tab depending from said upper surface or said protective cover with said tab being sized and positioned to extend into a crevice between said threshold cap and a wall of said upwardly open channel in which said threshold cap is supported to hold the protective cover removably in place on said assembly.

5,588,267

MULTI-SIZE ROOF FLASHINGS

Roberto Rodriguez, Cleveland, and Edward T. Shroka, Rocky River, both of Ohio, assignors to Oatey Co., Cleveland, Ohio

Filed Jul. 6, 1995, Ser. No. 498,574
Int. Cl.[6] E04D *13/14*
U.S. Cl. 52—219 **18 Claims**



1. A roof flashing with an elastomeric collar for establishing a weather-proof seal with upstanding pipes of different diameters extending through exterior openings in building structures, said collar comprising a frusto-conical shape member having an opening in an apex end for passage of the pipe, said member including smaller and larger diameter seals for sealingly engaging different diameter pipes, an internal annular groove in said member immediately above said larger diameter seal providing a frangible wall section in said member to facilitate removal of said smaller diameter seal from said member when said member is to be used to seal against larger diameter pipes, and an external annular bead on said member for resisting stretching of said member when engaged by a gripping tool immediately above said groove and pulled to provide a relatively clean tear in a region of said groove around an entire periphery of said member to separate said smaller diameter seal from said member.

5,588,268

PLATE ELEMENT FOR A BUILDING PANEL ASSEMBLY

Fritz Sterflinger, Papenburg, and Hans Möhlenkamp, Sögel, both of Germany, assignors to Jos. L. Meyer Werft GmbH & Co., Papenburg, Germany

PCT No. PCT/DE94/00692, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO95/00725, PCT Pub. Date Jan. 5, 1995
PCT Filed Jun. 17, 1994, Ser. No. 392,759
Claims priority, application Germany, Jun. 23, 1993, 43 20 740.5; Dec. 22, 1993, 43 43 859.8
Int. Cl.[6] E04B *5/10;* **E04C** *2/08;2/36;* **B63B** *3/48*
U.S. Cl. 52—236.7 **2 Claims**

1. A building panel assembly adapted for installation on a lower chord of a support construction comprising:

a steel plate element comprising:

(a) an upper and a lower outer sheet extending in parallel spaced relation to one another, each outer sheet having an inner surface facing the other sheet;

(b) a plurality of web strips interposed between said outer sheets, each web strip having opposite longitudinal edges welded to said inner surfaces of respective outer sheets with a laser weld which passes through each outer sheet to interconnect said outer sheets with one another;

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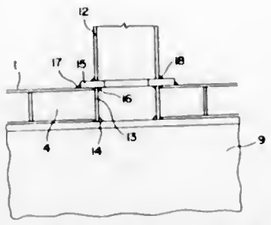


said plate element having a cutout extending therethrough and being adapted to lie across the lower chord with the cutout directly overlying the lower chord; and

a tubular support part, having a collar flange and a hollow interior bordered by an inside wall, disposed within the cutout and adapted to be supported by the lower chord and connected thereto by a weld on said inside wall, wherein said collar flange rests on said upper outer sheet and is welded thereto.

5,588,269

PREFABRICATED CONSTRUCTION SYSTEM FOR A TIMBER HOUSE

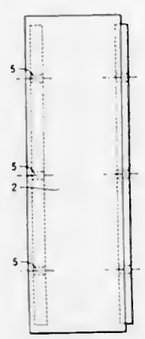
Edmund Wagner, Wiesbaden, Germany, assignor to Zorbedo GmbH, Wiesbaden, Germany

Filed Aug. 31, 1994, Ser. No. 297,919

Claims priority, application Germany, Sep. 1, 1993, 43 29 413.8

Int. Cl.[6] E04B *2/00*

U.S. Cl. 52—270 **13 Claims**



1. A prefabricated construction assembly, comprising:

a plurality of box-shaped rectangular panel elements, each panel element having:

at least first and second solid, continuous wood girders separated from one another by a distance and being parallel to one another to form two opposite first sides of the respective panel element, and

at least first and second panels connected to said girders and sandwiching said girders therebetween to form two opposite second sides of the respective panel element, said girders and said panels of the respective panel element collectively forming four sides of a box,

wherein two adjacent panel elements are connected together with a tongue-and-groove joint, said tongue-and-groove joint being formed by projecting said first girder from between said panels along one of the first sides, and setting back the second girder within said panels by a corresponding measure along the other of the first sides, and wherein said panels project beyond the ends of said girders at two oppositely located third sides of said panel element to define an upper and a lower end of the respective panel element and form continuous receiving elements extending in a direction from one of the first sides to the other of the first sides, and

a plurality of continuous orienting beams insertable into the respective receiving elements to be parallel thereto for orientating said panel elements in relation to each other at the third sides, said panel elements being placed next to each other and connected to each other by the tongue-and-groove joint, said orienting beams having rectangular cross sections and dimensions which are such that when said orienting beams are inserted into the respective receiving elements, the orienting beams abut against the inner sides of said panels, and form at each of the upper and lower ends at least one continuous free space between said orienting beams and the respective ends of said girders to receive supply lines, and at least at the upper end of said panel elements, the respective ends of said first and second girders form a support for said orienting beam designated for the respective receiving element.

5,588,270

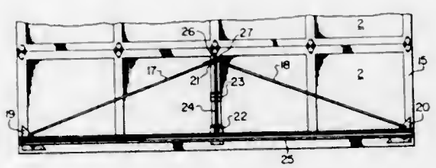
GARAGE DOOR BRACE

Carey E. Keating, 2106, 13531 Deer Run Boulevard SE., Calgary, Alberta, Canada

Filed Jun. 26, 1995, Ser. No. 494,947

Int. Cl.[6] E04G *23/00*

U.S. Cl. 52—291 **4 Claims**



1. A system for reinforcing multi-sectional doors of the type including multiple horizontal panels interconnected at each longitudinal side to adjacent panels, the system including corner plate means adapted for attachment to opposite lower corners of a bottom panel section of said door; first and second strut means one end of each said strut means fixedly attached to a respective one of said corner plate means, each said strut means extending upwardly and inwardly of said panel structure; an upper end of each said strut means being terminally attached to upper connector means such that said corner means, said strut means and said connector means define a substantially rigid triangular frame means within the confines of said bottom panel structure adjacent an inner facing surface thereof; pin means operably associated with said upper connector means to extend vertically downwardly therefrom to lower bracket means, adapted for attachment to a bottom said door; intermediate bracket means located vertically above said lower bracket means and spaced between said lower bracket means and said connector means, said intermediate bracket means adapted for attachment to said door and configured to positionally support and guide said pin means; means to put said pin means into tension and exert an upward force on the bottom of said door, while exerting a compressive force via said strut means to said corner plate means, thus compensating for door weight and eliminating sagging.

5,588,271

INTERLOCKING BUILDING BLOCK

Peter R. Pitchford, 170 Ellis Park Road, Toronto, Ontario, Canada

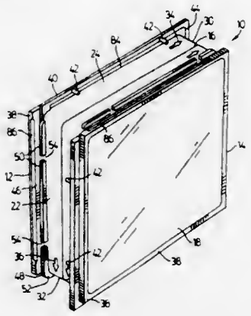
PCT No. PCT/CA93/00038, § 371 Date Sep. 29, 1993, § 102(e) Date Sep. 29, 1993, PCT Pub. No. WO93/15286, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 29, 1993, Ser. No. 122,485

Claims priority, application Canada, Jan. 30, 1992, 2060379-8

Int. Cl.[6] E04C *1/00;* **E04B** *2/00*

U.S. Cl. 52—306 **7 Claims**



1. An interlocking building block comprising:

a block having spaced-apart front and rear walls and peripheral end walls, the block being shaped such that a plurality of such blocks may be arranged in a contiguous manner with respective end walls touching to form a wall, there being at least two adjacent peripheral end walls on each block intersecting at an angle;

each of said intersecting end walls having an elongate rib and means defining a parallel elongate groove spaced therefrom and adapted to mate with a corresponding respective elongate groove and rib on an adjacent block;

a first interlocking means formed on one of the rib and the groove in one of said intersecting end Walls adapted to engage a complementary interlocking means on a first adjacent block to prevent longitudinal sliding movement of the rib in the groove with respect to said first adjacent block;

a second interlocking means formed on one of the rib and the groove in the other of said intersecting end walls adapted to engage a complementary interlocking means on a second adjacent block to prevent longitudinal sliding movement of the rib in the groove with respect to said second adjacent block; and

the first and second interlocking means being one of a lateral projection formed on the rib and means defining a lateral slot adjacent to the groove and located to receive a lateral projection formed on a rib of an adjacent block.

5,588,272

REINFORCED MONOLITHIC CONCRETE WALL STRUCTURE FOR SPANNING SPACED-APART FOOTINGS AND THE LIKE

Edward L. Haponski, P.O. Box 456, Coats, N.C. 27521

Filed Nov. 28, 1994, Ser. No. 345,857

Int. Cl.[6] E04B *1/04*

U.S. Cl. 52—309.12 **22 Claims**

1. A precast, reinforced concrete wall structure for spanning spaced-apart footings and forming a part of a building structure, comprising:

a) a noncased vertical main section including a pair of opposed concrete panels, an insulation board disposed between the concrete panels such that the insulation board is covered on opposite sides with concrete and effectively embedded within the concrete that forms the pair of opposed concrete panels whereby the embedded insulation board retains heat within the building structure, and reinforcing material embedded within each concrete panel;

b) wherein the opposed concrete panels wrap around the insulation board and form a single concrete structure;

c) a plurality of vertical concrete columns integral with the concrete panels and extending continuously from a bottom portion of the concrete wall structure to a top portion of the concrete wall structure and wherein the insulation board is disposed between the plurality of vertical concrete columns and wherein the columns are reinforced and disposed about opposite end portions of the concrete wall structure so as to permit the concrete wall structure to span two spaced apart footings; and

d) an upper horizontal concrete beam integral with and positioned atop the vertical main section and the vertical concrete columns, the upper horizontal concrete beam including a plurality of horizontal reinforcing members and being thicker than the vertical main section, and wherein the upper concrete beam strengthens the concrete wall structure such that the same can span the spaced-apart footings.

5,588,273

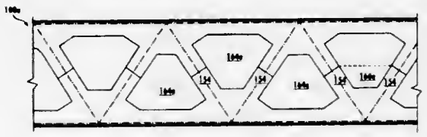
STRUCTURAL BEAM

Paul F. Csagoly, 2519 McMullen Booth Rd., Ste. 510, Clearwater, Fla. 34621

Filed Feb. 6, 1995, Ser. No. 384,144

Int. Cl.[6] E04C *3/08*

U.S. Cl. 52—634 **15 Claims**



1. A structural beam comprising:

a top flange,

a bottom flange,

a substantially planar web joining the top and bottom flanges;

a plurality of apertures located within the web;

a top chord, said top chord including said top flange and a longitudinally uninterrupted web portion, said top chord further including a neutral axis;

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a bottom chord, said bottom chord including said bottom flange and a longitudinally uninterrupted web portion, said bottom chord further including a neutral axis;

a plurality of joining members located in said web between the top and bottom chord;

each said joining member adapted to transmit loading forces along a diagonal axis, said diagonal axes of adjacent joining members intersecting at panel points, said panel points located substantially along the neutral axis of a respective chord; and

haunches located in the plane of the web providing local structural deepenings of the top and bottom chords in the regions of the panel points;

wherein said haunches are substantially trapezoidal-shaped, each substantially trapezoidal-shaped haunch having a first side located proximate its respective chord and a second side, parallel with the first side, located distal from its respective chord, said first side being longer than said second side and, wherein each joining member includes a pair of opposing side edges, each said side edge terminating at a location spaced from both said top and bottom chords.

5,588,274

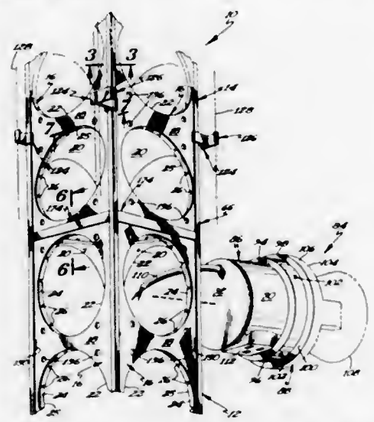
MODULAR STRUCTURAL FRAMING SYSTEM

Fredric Lange, 13690 Elm Creek Rd., Osseo, Minn. 55369-9343

Filed Jul. 16, 1993, Ser. No. 92,602

Int. Cl.[6] F04H *12/10;* **E04B** *1/38;* **F16B** *5/06*

U.S. Cl. 52—653.1 **32 Claims**



1. Modular structural framing system comprising, in combination: first and second structural members each having first and second faces, with the first faces of the first and second structural members having complementary shapes for abutting with each other, with each of the first and second structural members having at least first ports formed therein, with the first ports extending through the first and second faces of the first and second structural members and being of the same size; a clamp comprising, in combination: a primary band including a central wall having a length less than the perimeter of the first ports, with the primary band being generally annular but U-shaped and having first and second free ends, with the primary band having a normal shape which is of a size smaller than and for insertion into the ports, first and second secondary bands each having first and second ends, means for pivotally mounting the first ends of the first and second secondary bands together about a first axis, means for pivotally mounting the second end of the first secondary band relative to the first free end of the primary band, and means for pivotally mounting the second end of the second secondary band relative to the second free end of the primary band, with pivotal movement of the first and second secondary bands about the first axis causing the primary band to distort from its normal shape to further separate the first and second free ends of the primary band; wherein at least the first structural member is three-dimensional and hollow, with the first structural member being formed by a plurality of attachment panels having thicknesses and first edges and by means for removably securing the first edge of one attachment panel to the first edge of another attachment panel, with the removably securing means comprising, in combination: a plurality of latches extending from and equally spaced along the first edge, with each of the latches lying within the same plane, and at least one detent portion formed in each of the latches, with the detent portions intersecting the plane of the latches at a nonlinear angle, with the ports formed in the attachment panels; an accessory comprising, in combination: an end plate having a periphery of a size larger than the port, a channel formed in the end plate and extending from a first point of the periphery to a second point spaced from a third point of the periphery diametrically opposite the first point a distance less than the size of the port, with the channel having a width greater than and for slideably receiving the thickness of the panel, and a support member secured to the end plate, with the attachment panels having rectangular slits spaced from the first edges, inside surfaces and outside surfaces; a clip comprising, in combination: a first portion for abutting with the inside surface of the attachment panel, a second portion extending continuously and at a non-linear angle to the first portion, a third portion extending continuously and at a non-linear angle to the second portion in a direction away from but parallel to the first portion, with the third portion abutting with the outside surface of the attachment panel, and means secured to the third portion for holding accessories to the attachment panel, with at least the first and second portions including rectangular cross sections having a width and thickness for slideable receipt in the rectangular slit, with the second portion spacing the first and second portions a distance generally equal to the thickness of the attachment panel between the inside surface and the outside surface, with the latches and detent portions of the attachment panels being L-shaped, with the latches and detent portions of first and second attachment panels having a generally T-shape in a latched condition; and a connector comprising means for forming a T-shaped slot of a size for slideable receipt upon the generally T-shape of the latches and detent portions of the first and second attachment panels in the latched condition.

5,588,275

Patent Not Issued For This Number

5,588,276

SLEEVING MACHINE

Herman F. Terjung, 412 N. Exeter St., Baltimore, Md. 21202, and David P. Crum, 4207 Kolb Ave., Baltimore, Md. 21206

Continuation-in-part of Ser. No. 25,843, Mar. 3, 1993, Pat. No. 5,379,570. This application Dec. 5, 1994, Ser. No. 349,433

Int. Cl.[6] B65B *13/02;19/18;57/06;57/18*

U.S. Cl. 53—399 **23 Claims**

19. A method for automatically inserting a tray of postal mail into a sleeve, the sleeve having a top, a bottom, two opposite sides therebetween and two open ends, the sides each having a height, the method comprising the steps of:

providing a transport station having a first side, a second side, a first end and a second end, the sides being substantially perpendicular to the ends;

providing a continuous transport means disposed between the sides of the transport station, providing at least one pusher means attached to the transport means such that the at least one pusher means may engage the tray;

placing the tray on the transport means at the first end of the transport station and moving said tray to the second end of the transport station;

providing a sleeving station adjacent to the second end of the transport station, the sleeving station having a base surface, a first sidewall and an opposite second sidewall, the transport means extending through the sleeving station between the sidewalls of the sleeving station, wherein the at least one pusher means advances the tray in a direction from the transport station to the sleeving station;

the first sidewall of the sleeving station being a hopper, providing a plurality of collapsed sleeves within the hopper, providing means within the hopper for dispensing the collapsed sleeves one at a time as desired, into the sleeving station, dispensing the collapsed sleeve into the sleeving station such that when dispensed from the hopper, the sleeve is received between the opposite sidewalls of the sleeving station, the base surface of the sleeving station supporting the bottom of the sleeve, the hopper supporting one of the sides of the sleeve providing a source of vacuum and a suction head interruptably connected to the source of vacuum, adjustably disposing the suction head above the sleeving station for engaging the top of the collapsed sleeve;

applying vacuum to the suction head and fully opening the collapsed sleeve;

discontinuing application of vacuum to the suction head;

advancing the tray into the opened sleeve in the sleeving station and pushing the sleeve containing the tray out of the sleeving station and

sequentially repeating of the steps.

5,588,277

BAND APPLICATOR FOR APPLYING A BAND ABOUT A SHEET OF MATERIAL AND A POT

Donald E. Weder, Highland; William F. Straeter, Breese, and Joseph G. Straeter, Highland, all of Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

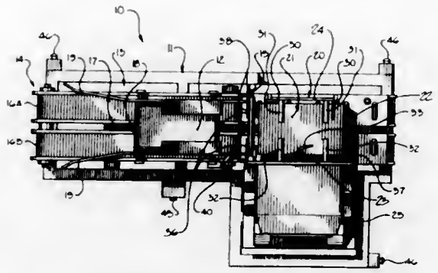
Continuation of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 934,832is a continuation-in-part of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned. This application Apr. 17, 1995, Ser. No. 423,678

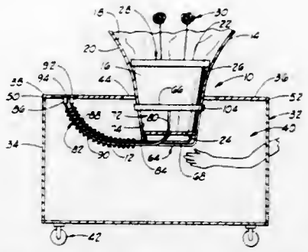
Int. Cl.[6] B65B *13/02;67/08*

U.S. Cl. 53—399 **10 Claims**

1. A method for placing a band about a sheet of material for holding the sheet of material about at least a portion of the outer peripheral surface of a flower pot and thereby provide a decorative cover for the flower pot wherein an open upper end of the flower pot remains substantially uncovered by the decorative cover, comprising:

providing a pot frame having a pot receiving space formed therein;





positioning at least one sheet of material on the pot frame so that the sheet of material is disposed over the pot receiving space in the pot frame;

moving the flower pot and the sheet of material into the pot receiving space in the pot frame for forming the sheet of material into a decorative cover extending about the outer peripheral surface of the flower pot and for holding the decorative cover about the outer peripheral surface of the flower pot while maintaining the open upper end of the flower pot substantially uncovered by the decorative cover;

positioning a band about a decorative cover to secure the decorative cover about the outer peripheral surface of the flower pot while the decorative cover is held about the outer peripheral surface of the flower pot by the pot frame; and

removing the flower pot with the decorative cover secured thereto by the band from the pot receiving space in the pot frame.

5,588,278

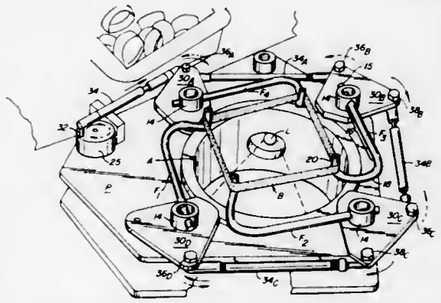
BROCCOLI BANDING MACHINE

Ed Wynn, Monterey; Javier Diaz-Infante, Salinas, and Peter deGroot, Carmel, all of Calif., assignors to Dole Fresh Vegetables Co., Salinas, Calif.

Filed Jun. 27, 1995, Ser. No. 495,235

Int. Cl.[6] B65B *53/00;11/00*

U.S. Cl. 53—399 **8 Claims**



5. A process including a broccoli banding machine for placing a rubber band about a bouquet of broccoli comprising the steps of:

providing a broccoli banding machine including:

a plate with a central aperture;

a light sensor mounted immediate said central aperture;

a light source for emanating a beam across the central aperture to said light sensor;

band engaging fingers attached to said plate and moveable between a first position juxtaposed one to another at said central aperture to a second position wherein said fingers are separate from one another; and,

a motor drive for moving said band engaging fingers between said first and second position;

bunching a bouquet of broccoli with the stems of said bouquet held together;

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interrupting said light beam with said bunched stems of broccoli;

actuating said motor drive responsive to interruption of said light beam to move said fingers from said second position wherein said fingers are away from said central aperture to said first position wherein said fingers are juxtaposed to one another at said central aperture to place a rubber band about said broccoli stems;

removing said broccoli bouquet with said rubber band on said stems;

placing a replacement rubber band on said fingers; and,

actuating said motor drive after said rubber band is on said fingers to move said fingers from said first position wherein said fingers are juxtaposed to one another at said central aperture to said second position where said fingers are away from said central aperture to expand said rubber band upon expiration of a time delay.

5,588,279

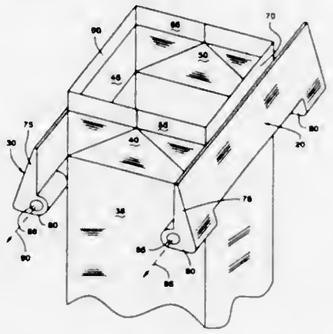
APPARATUS AND METHOD FOR TRANSPORTING A CONTAINER BETWEEN PROCESSING STATIONS OF A PACKAGING MACHINE

Bo Runnberg, Dalby, Sweden, and Tommy B. G. Ljungström, Buffalo Grove, Ill., assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Sep. 26, 1994, Ser. No. 311,963

Int. Cl.[6] B65B *3/00;7/20;43/46;55/04*

U.S. Cl. 53—426 **34 Claims**



1. An apparatus for use while moving a container from a first processing station to a second processing station of a packaging machine, said container including a top portion defined by a plurality of sealing panels, said apparatus comprising:

(a) pincers for temporarily holding said sealing panels of said container in a generally closed condition as said container is moved along a container path having a first end defined by said first processing station and a second end defined by said second processing station, the pincers comprising

i. a first arm at least partially rotatable about a first pivot axis extending in the direction of the container path,

ii. a second arm at least partially rotatable about a second pivot axis extending in the direction of the container path, said first and second arms being rotatable toward one another to grip and temporarily seal said sealing panels; and

(b) means for moving said pincers along with the container along at least a substantial distance of the container path while maintaining the container in the closed condition.

5,588,280

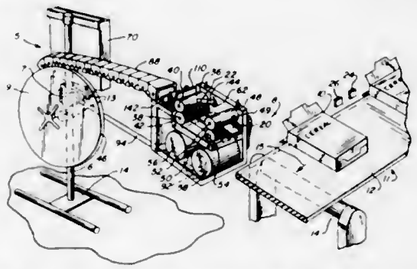
COUPON INSERTING APPARATUS AND METHOD

Thomas G. Kotsiopoulos, Northfield, Ill., assignor to Carol Joyce Witt, Lake Zurich, Ill.

Continuation of Ser. No. 129,482, Sep. 29, 1993, abandoned, which is a continuation of Ser. No. 819,766, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 634,923, Dec. 21, 1990, Pat. No. 5,079,901, which is a continuation of Ser. No. 348,860, May 8, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,766

Int. Cl.[6] B65H *35/10*

U.S. Cl. 53—435 **20 Claims**



20. A method of delivering coupons, one at a time, to moving containers as the containers move past a predetermined point of insertion, the coupons being provided in a continuous web wherein a trailing edge of a forwardmost coupon is detachably connected to a leading edge of a successive coupon by a weakened separable portion therebetween and wherein each coupon after the successive coupon is similarly connected in the web, the method thereby manufacturing containers having coupons therein and comprising the steps of:

sensing the movement of the containers relative to the predetermined point of insertion and generating a timing signal based upon the movement of the containers, the timing signal pertaining to when one of the containers will be at the predetermined point of insertion;

sensing the presence and absence of the forwardmost coupon at a sensing position and generating a sensing signal pertaining thereto;

providing a coupon separation and delivery subassembly between the continuous web of coupons and the predetermined point of insertion, the subassembly including feed rolls and positioning rolls, the positioning rolls disposed downstream of the feed rolls;

advancing the continuous web of coupons utilizing the feed rolls;

providing a first output signal based in part upon the timing signal and the sensing signal, and

separating the forwardmost coupon from the successive coupon in response to the first output signal and delivering the forwardmost coupon to one of the moving containers as said container moves past the predetermined point of insertion.

5,588,281

METHOD OF PRODUCING CARTONS OF CIGARETTES WITH A RIGID HINGED-LID WRAPPING

Silvano Boriani, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy

Filed May 15, 1995, Ser. No. 440,776

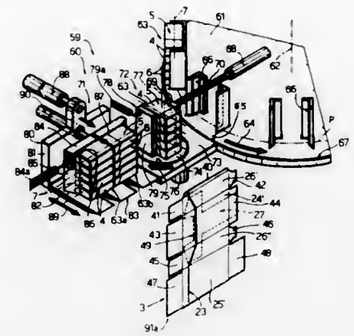
Claims priority, application Italy, May 16, 1994, B094A-0213

Int. Cl.[6] B65B *35/30*

U.S. Cl. 53—443 **5 Claims**

1. A method of producing cartons of cigarettes with a rigid hinged-lid wrapping, the method being characterized in that it comprises the steps of:

forming groups of packets of cigarettes by feeding stacks of cigarettes successively along a given path and in a first



direction parallel to the longer axes of the packets; successively expelling the stacks from said path in a second direction; rotating each stack 90° about an axis crosswise to said first and second directions, so that said longer axes are parallel to said second direction; and again feeding the stacks, so oriented, in said second direction, so that each stack is positioned end to end alongside another stack, thus forming a respective said group of at least two end to end stacks in which each packet in each stack is laid flat with its longer axis horizontal and aligned with the longer axis of a corresponding packet in the other stack;

feeding a flat blank of said rigid wrapping into a position between said group of at least two end to end stacks and a folding spindle, the spindle facing the group in a direction crosswise to the longer axes of the packets;

and feeding each group, crosswise to the longer axes of the packets and together with said flat blank, into engagement with said spindle, so as to fold the blank in contact with the spindle, and so that the bottom wall of the spindle supports the group with the interposition of a panel of the blank corresponding to a lateral wall of the rigid wrapping.

5,588,282

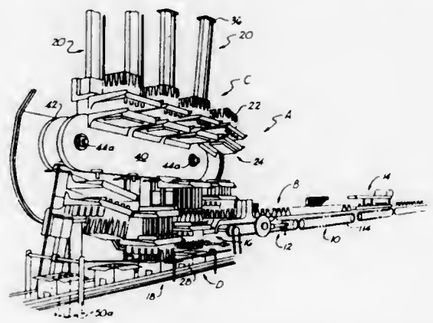
CONTINUOUS MOTION CASE PACKING APPARATUS AND METHOD

Thomas P. Hartness, Greenville, S.C., assignor to Hartness International, Inc., Greenville, S.C.

Filed Nov. 10, 1994, Ser. No. 338,026

Int. Cl.[6] B65B *5/08;21/06;21/18*

U.S. Cl. 53—473 **76 Claims**



1. Apparatus for packing articles conveyed in at least one longitudinal row into cases in a continuous motion comprising:

a slug feeder receiving said row of articles for forming a slug containing a predetermined number of said articles in said row and conveying said articles to a slug pick-up station;

said slug pick-up station supporting said slug of articles in a position to be picked up for transfer to a case packing station;

a vertical revolving carriage which carries a plurality of article transfer arms;

a plurality of article pick-up heads carried by said transfer arms which reciprocate in a linear motion relative to said transfer arms for picking up said slug of articles at said slug pick-up station;

said carriage carrying said transfer arms and pick-up heads in a curved, vertical plane path which includes a linear transfer section between said slug pick-up station and said case packing station in a generally straight line path;

an actuator associated with said pick-up heads having a first position in which a slug of articles is retained by said pick-up head at said slug pick-up station for transfer, and said actuator having a second position in which said slug of articles is released for deposit into said case at said case packing station; and

a case indexing conveyor for conveying indexed cases to said case packing station for receiving said released slug in synchronization with said moving carriage and said slug feeder.

5,588,283

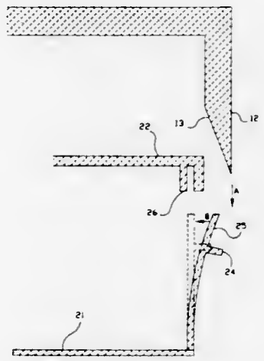
LIDDING MACHINE

Herman W. Martin, Aldergrove, Canada, assignor to Ropak Canada Inc., Delta, Canada

Filed Jun. 7, 1995, Ser. No. 483,758

Int. Cl.[6] B67B *1/04;3/22;* **B65B** *7/28*

U.S. Cl. 53—486 **9 Claims**



1. An apparatus for lidding and sealing a resilient pail having a sealing lip and lip flange, with a lid having a lip sealing surface corresponding to the pail lip, comprising:

a. a pail holding tool in a base;

b. a lid press plate slidably engaged in a bridge on a base for sliding movement in a direction normal to the base while the lid press plate is substantially parallel to the base, the lid press plate having alignment guides depending from its edges for engaging the lip flanges of the pail and conforming the pail lip shape to the lid sealing surface shape as the lid is pressed by the plate onto the pail.

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5,588,284

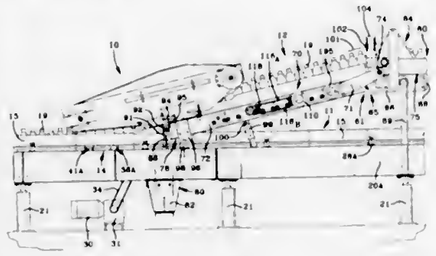
METHOD AND APPARATUS FOR PACKING A PLURALITY OF ARTICLES IN CARTONS

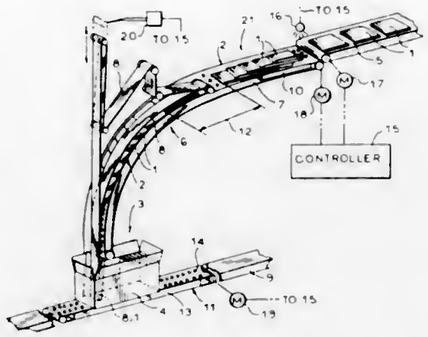
John M. Klover, Canton, and Philip F. Hamrick, Atwater, both of Ohio, assignors to Hamrick Manufacturing & Service, Inc., Mogadore, Ohio

Filed Apr. 10, 1995, Ser. No. 419,423

Int. Cl.[6] B65B *5/10;21/10*

U.S. Cl. 53—534 **19 Claims**





1. An apparatus for continuously packing a plurality of articles into cartons, said apparatus comprising:

a loading station;

said loading station incorporating a plurality of support rollers disposed in longitudinally spaced series;

a belt means freely rotatable across said series of support rollers; and

a brake means to adjust the resistance provided said belt to a carton traversing said loading station;

a carton delivery queue for providing a continuous sequence of cartons to said loading station;

means to transport the cartons along said carton delivery queue and to maintain at least the next successive carton in said queue in continuously juxtaposed, longitudinal engagement with any carton on said loading station;

an article orienting and delivery queue for longitudinally aligning a plurality of articles in the desired side-by-side relationship;

a slide assembly included in said article orienting and delivery queue;

said slide assembly being inclined to assure that the articles will be gravity-propelled to a sufficient degree longitudinally to traverse said slide assembly and be received at said loading station;

flight means longitudinally to space the articles in the predetermined grouping required for that carton at said loading station; and,

said gravity-propelled, descending movement of the articles and the resulting engagement of the articles with a carton at said loading station effecting synchronous movement of the carton along said loading station relative to the movement of the articles along said slide assembly so that the articles will be continuously deposited within the carton.

5,588,285

SYSTEM FOR LOADING PACKAGES INTO A BOX

Heinz F. Odenthal, Zülpich, Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Germany

Filed Jul. 6, 1995, Ser. No. 498,941

Claims priority, application Germany, Jul. 12, 1994, 94 10 970.2 U

Int. Cl.[6] B65B *35/30*

U.S. Cl. 53—534 **4 Claims**

1. A system for packing a plurality of packages into a container, the system comprising:

means including an input conveyor for delivering the packages one at a time at regular intervals and at a constant input speed to a transfer station;

an output conveyor having a perforated lower belt and an upper belt together defining a path extending from an upstream end at the transfer station to a downstream end at a loading station, the downstream end being vertically displaceable at the loading station;

a container conveyor extending past the loading station under the downstream end of the output conveyor;

means for advancing the container conveyor at a relatively high container speed and at a relatively low container speed for displacing a succession of the containers through the station;

means connected to the downstream end of the output conveyor for displacing it between a lower position in a one of the containers in the loading station and an upper position out of the way of the containers passing on the container conveyor;

means connected to the output conveyor for displacing it and any packages held by it at a relatively low stacking speed that is slower than the input speed and at a relatively high gapping speed that is higher than the input speed, whereby when the output conveyor is running at the slow stacking speed packages deposited on it by the input conveyor will overlap one another and when the output conveyor is running at the high gapping speed a space will be formed between packages on the output conveyor and packages deposited thereon by the input conveyor;

a suction box underneath the perforated lower belt at the transfer station; and

control means connected to the suction box and to all of the means for

operating the output conveyor at the low stacking speed to form an overlapped group of the packages on the output conveyor while drawing air via the suction box in through the lower belt to adhere the packages to the lower belt,

periodically switching the output conveyor from the low stacking speed to the high gapping speed when a predetermined number of the packages have been deposited on the output conveyor by the input conveyor to form a space on the output conveyor between succeeding groups of packages,

operating the container conveyor at the low speed and simultaneously moving the output-conveyor downstream end into the lower position dipped into a one of the containers in the loading station to deposit a group of the packages into the container in the loading station, and

operating the container conveyor at the high speed and simultaneously moving the output-conveyor downstream end into the upper position clear of the container in the loading station to displace a full container out of the loading station, the control means switching the container conveyor between its high and low speeds synchronously with switching of the output conveyor between its gapping and stacking speeds.

5,588,286

FOLDING DEVICE, ESPECIALLY FOLDING TURRET, WITH FOLDING MANDREL

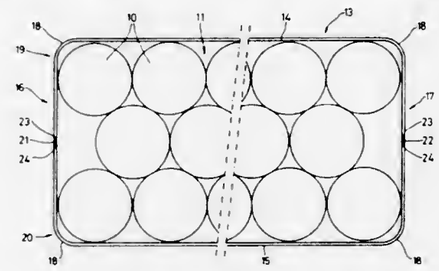
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Oct. 18, 1995, Ser. No. 544,476

Claims priority, application Germany, Oct. 19, 1994, 44 37 404.6

Int. Cl.[6] B65B *11/02;19/24;* **B31B** *1/28;* **B23K** *26/00*

U.S. Cl. 53—575 **11 Claims**



1. A folding device, for pack blanks (**12**) and pack contents (**10**), comprising a folding mandrel (**13**) which is positioned so as to project from one side of the folding device, which is open at two opposite ends thereof, and which is made of thin-walled metallic material, wherein the folding mandrel (**13**) comprises at least one sheet of said material, said sheet having at least one longitudinal laser-weld seam (**21**, **22**; **29**, **30**).

5,588,287

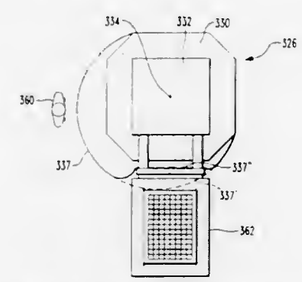
WRAPPING APPARATUS WITH BARRIER

Ruth Lerner, and John Fain, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 338,165, Nov. 10, 1994, abandoned. This application Jun. 15, 1995, Ser. No. 490,763

Int. Cl.[6] B65B *11/04*

U.S. Cl. 53—588 **24 Claims**



1. An apparatus for wrapping a load with packaging material comprising:

a dispenser for dispensing a sheet of packaging material;

a turntable assembly including a turntable base and a powered turntable having a generally horizontal support surface for supporting the load and mounted in the base for rotation about a generally vertical axis to wrap the sheet of packaging material around the load, the support surface having a peripheral edge;

a horizontally displaceable barrier mounted to the turntable for rotation with the turntable and positioned along at least a portion of the peripheral edge of the support surface, the barrier having an outer surface at a position normally spaced at a greater distance from the vertical axis than the peripheral edge of the support surface along which the displaceable barrier is mounted; and

means for automatically returning the barrier to its normally spaced position after being horizontally displaced.

5,588,288

BOOT FOR SHOD ANIMAL'S HOOVES

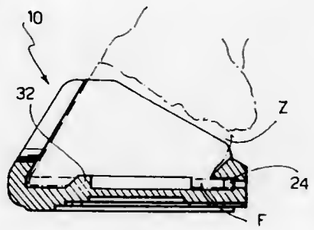
Ambrogio Origgi, Via Canova, 12-29010 Piozzano (Piacenza), and Silver Pecis, Via Vallunga, 5-24060 Foresto Sparso (Bergamo), both of Italy

Filed Nov. 8, 1994, Ser. No. 337,831

Claims priority, application Italy, Nov. 10, 1993, MI93U0875

Int. Cl.[6] B68C *5/00*

U.S. Cl. 54—82 **12 Claims**



1. A boot made of flexible elastic material for the hooves of hoofed animals, comprising:

a sole part; and

an upper part that is integral with the sole part and defines therewith a housing to accommodate a hoof,

wherein the sole part has a seat formed inside to accommodate a shoe fitted to the hoof and at least one hollow at the back for protruding heel parts of the shoe, said at least one hollow being defined at its top by an elastic check tooth,

wherein said check tooth has a sloping upper surface tapered downwardly toward the inside of the sole part, and a sharply projecting lower surface.

5,588,289

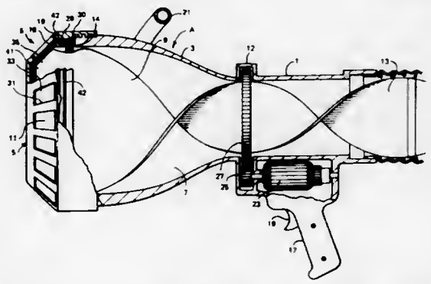
GARDEN CUTTING TOOLS

Graham J. Wilson, Brownroyd, 263 Pensby Rd., Pensby, Wirral, L61 5UA, England

Filed Nov. 8, 1994, Ser. No. 336,751

Int. Cl.[6] A01D *55/00*

U.S. Cl. 56—13.1 **38 Claims**



1. A cutting tool for use in the garden and workshops, comprising a body which houses a screw impeller which can be driven by a motor, the screw impeller being arranged to generate an air flow and to move waste along a flow path extending generally coaxial

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with the screw impeller, through the body from an inlet to an outlet, the outlet being connectable to a receptacle which is adapted to entrap any material extrained by the air flow, a cutting blade which is rotatable coaxially with the screw impeller being arranged to be driven by the screw impeller and being located adjacent to the inlet and aligned with a fixed cutting blade which is fixed relative to the body to cut material projecting therebetween, which cut material is entrained through the body by the screw impeller and collected in the receptacle.

5,588,290

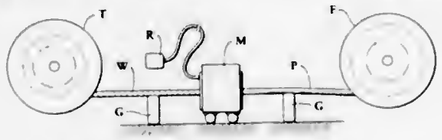
REEL-TO-REEL PIPE WRAP MACHINE

Robert E. Cobb, Rte. 8, Box 267-B, Claremore, Okla. 74017

Filed Apr. 17, 1995, Ser. No. 424,735

Int. Cl.[6] D02G *3/36*

U.S. Cl. 57—3 **10 Claims**



1. A pipe wrapping system comprising:

a feeder reel for dispensing pipe coiled thereon;

a take-up reel for collecting the dispensed pipe in coils thereabout;

means independently disposed between said feeder and take-up reels and engaged with the pipe for travel along said pipe for spirally wrapping tape about the pipe; and

means for varying a rate of travel of said wrapping means in relation to the pipe to maintain said wrapping means between said feeder and take-up reels as a rate of travel of the pipe varies.

5,588,291

METHOD FOR CONTROLLING THE HEATING OF AN ELECTRICALLY HEATABLE CATALYTIC CONVERTER

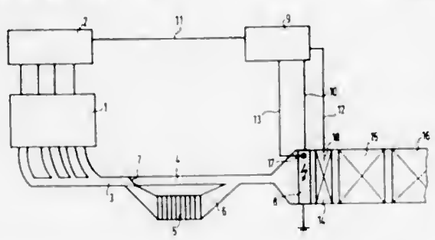
Wolfgang Maus; Rolf Brück, and Helmut Swars, all of Bergisch Gladbach, Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Filed Jun. 2, 1995, Ser. No. 458,493

Claims priority, application Germany, Dec. 9, 1992, 42 41 494.6

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **19 Claims**



1. In a method for controlling the heating of a catalytic converter being connected downstream of an internal combustion engine of a motor vehicle and having at least a short portion to be quickly electrically heated, the improvement which comprises:

turning on electric heating only after a delay after starting the internal combustion engine, if a rate of temperature change in the heatable portion of the catalytic converter, being caused by heat contained in exhaust gases of the internal combustion engine, is no greater than approximately a rate of temperature change attainable by electric heating.

5,588,292

EXHAUST GAS PURIFIER

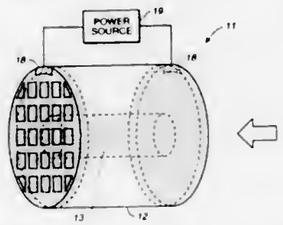
Masahiro Hiraishi, Kyoto, and Shin-ichi Kuroda, Osaka, both of Japan, assignors to Shimadzu Corporation, Japan

Filed Jun. 20, 1995, Ser. No. 493,213

Claims priority, application Japan, Jun. 28, 1994, 6-146499

Int. Cl.[6] F01N *3/28*

U.S. Cl. 60—300 **20 Claims**



1. An exhaust gas purifier comprising:

a honeycomb of an electrically non-conductive material, formed with a plurality of longitudinally extending throughholes and having end surfaces which are longitudinally opposite each other wherein an exhaust gas can flow through said throughholes from one to the other of said end surfaces;

a conductive layer formed with an electrically conductive material on inner surfaces of parts of said honeycomb, said parts including at least a portion of each of said end surfaces and a selected portion of said honeycomb longitudinally extended between said end surfaces;

a catalyst layer containing a catalyst, formed on inner surfaces of said honeycomb;

heating means for heating said honeycomb by causing an electric current to pass through said conductive layer and thereby activating said catalyst.

5,588,293

FLUID ENERGY CONVERSION APPARATUS

Rikurou Nozu, 13-1, Chishirodai Higashi 4-chome, Wakaba-ku, Chiba-shi Chiba, Japan

PCT No. PCT/JP92/01365, § 371 Date Jun. 18, 1993, § 102(e) Date Jun. 18, 1993, PCT Pub. No. WO93/08375, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 21, 1992, Ser. No. 81,288

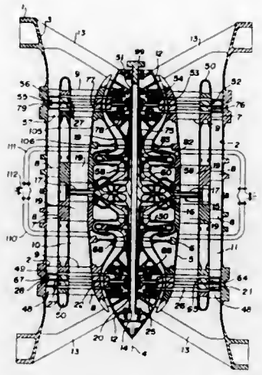
Claims priority, application Japan, Oct. 21, 1991, 3-336386

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—398 **6 Claims**

1. A fluid energy conversion apparatus, comprising:

a fluid path assembly including an outside guide assembly provided with a cylindrical wall inside surface at a principal portion of an inside wall thereof; at least one inside guide assembly having an outside surface formed in a shape of rotation symmetry arranged symmetrically on the central axis of said cylindrical wall inside surface; a cylindrical partition wall which extends between said outside guide assembly and said inside guide assembly, with its central axis set on the central axis of said cylindrical wall inside surface, said cylindrical wall inside surface of said outside guide assembly and said cylindrical partition wall defining an annular outside path therebetween, the outside peripheral surface of said inside guide assembly and said cylindrical partition wall defining an annular inside path therebetween; and a plurality of support struts connecting said outside guide assembly, said inside guide assembly and said cylindrical partition wall;



a first rotor shaft having a rotational central axis on the central axis of said cylindrical wall inside surface of said outside guide assembly, and rotatably supported on said fluid path assembly;

a second rotor shaft arranged coaxially with and rotatably on said the first rotor shaft;

a first rotary member having a first annular hub located adjacent a first end portion of said inside guide assembly in the axial direction thereof and coaxially fixed on said first rotor shaft, and a plurality of first turbine rotor blades fixed on said first annular hub and radially protruding in said annular inside path;

a second rotary member having a second annular hub located adjacent a second end portion of said inside guide assembly in the axial direction thereof, supported coaxially with and rotatably on said second rotor shaft and drivingly coupled with said second rotor shaft through an overdrive gearing; a first annular ring member having substantially the same radius as that of said cylindrical partition wall and supported on said second annular hub coaxially with said second rotor shaft by a plurality of support struts protruding into said annular inside path; a plurality of second turbine rotor blades each fixed on an outside surface of said first annular ring member and protruding radially into said annular outside path:

first stator blades including a first row of a plurality of stator blades and a second row of a plurality of stator blades, each stator blade in said first row having a corresponding stator blade in said second row, each of said corresponding stator blades forming a pair of stator blades, each of said stator blades being fixed at one end thereof on said cylindrical wall inside surface of said outside guide assembly, with each pair of stator blades radially protruding into said outside path at both sides of said second turbine rotor blades in the direction of the central axis of said cylindrical wall inside surface at a substantially equal spacing in a circumferential direction of said cylindrical wall inside surface; and

a fluid pressurizing-accelerating device including a casing means fixed on said inside guide assembly at the inside thereof and having a discharge port directed towards said first annular hub of said first rotary member, a rotor means located inside of said casing means and fixedly mounted on said second rotor shaft;

said first annular hub of said first rotary member having in an outer peripheral edge portion on one side thereof a collector port for receiving a fluid from said discharge port of said fluid pressurizing-accelerating device; each of said first turbine rotor blades having a symmetrical airofoil blade section having a chord line existing in a plane normal to said first rotor shaft and a fluid exhaust path which is communicated at one end thereof with said collector port of said first annular hub and also communicates at the other end thereof with an exhaust nozzle formed in both sides of each of said first turbine rotor blades in a position adjacent to a trailing edge of each of said first turbine rotor blades; and

said first row of stator blades and said second row of stator blades each being positioned in a row extending in the circumferential direction of said cylindrical wall inside surface, one of said first row of stator blades and one of said second row of stator blades being a pair and positioned on opposed sides of said second turbine rotor blades formed in an airofoil section; each of said first and second rows of stator blades having a chord line inclined in relation to a plane normal to the rotational central axis of said second rotary member, the chord lines of said first and second rows of stator blades being intersected with each other at the outside of the blade sections, whereby said second rotary member being rotated only in a single direction by means of said second turbine rotor blades and said first stator blades.

5,588,294

HYDROSTATIC TRANSMISSION

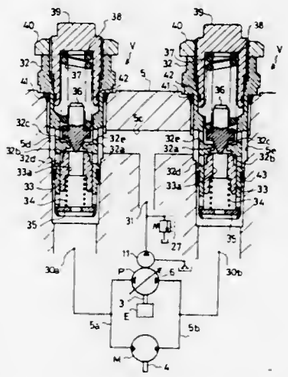
Shinya Sakakura; Ryota Ohashi, and Shigenori Sakikawa, all of Amagasaki, Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Jul. 31, 1995, Ser. No. 508,395

Claims priority, application Japan, Sep. 13, 1994, 6-218611

Int. Cl.[6] F16D *31/02;39/00*

U.S. Cl. 60—464 **9 Claims**



1. A hydrostatic transmission, comprising:

a hydraulic motor;

a hydraulic pump;

a closed circuit having a low pressure side and a high pressure side for connecting said hydraulic pump and said hydraulic motor in fluid communication with each other, said closed circuit including a first side circuit and a second side circuit;

a supply circuit for supplying oil to said closed circuit;

wherein said first side circuit and said second side circuit each includes

a valve casing,

a check valve disposed within said valve casing, said check valve including a valve body and a bore formed within said valve body, said check valve allowing oil to be supplied only to the low pressure side of said closed circuit,

a relief valve disposed opposite to said check valve within said valve casing, said relief valve including a relief spring, wherein high pressure within said closed circuit acts on said relief valve through said bore to thereby regulate pressure within said closed circuit, and

a cover detachably mounted to one end of said valve casing.

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5,588,295

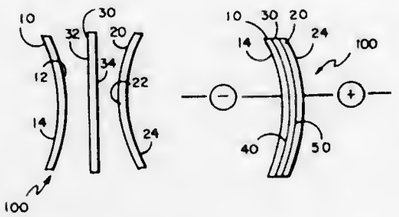
TRI-STRIP MEMORY METAL ACTUATOR

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 349,793, Dec. 6, 1994, which is a continuation-in-part of Ser. No. 921,631, Jul. 30, 1992, abandoned. This application Sep. 22, 1995, Ser. No. 532,352

Int. Cl.[6] F01B *29/10*

U.S. Cl. 60—528 **2 Claims**



1. An actuator, comprising:

a first arcuate strip of memory metal having electrically conductive properties, said first arcuate strip having a convex side and a concave side;

a second arcuate strip of memory metal having electrically conductive properties, said second arcuate strip having a convex side and a concave side; and

a straight central strip of material having electrically conductive properties, said central strip being composed of a material dissimilar from that of said first and second arcuate strips; said central strip having a first side and a second side, said convex side of said first arcuate strip, when in its memory shape state, being attached to said first side of said central strip and forms a first junction with said central strip, said convex side of said second arcuate strip being attached to said second side of said central strip and forms a second junction with said central strip, so that said first and second arcuate strips clad, respectively, on said first and second sides of said central strip form a Peltier junction whereby passing a current through said strips of said actuator causes one of said junctions to heat and the other junction to cool and become amorphous, malleable and formable while said arcuate strip forming said junction that heats crystallizes and assumes its original arcuate shape thereby causing said actuator to bend and assume that arcuate shape, said actuator when the direction of said current is reversed bending in the opposite direction and assuming the arcuate shape of the other arcuate strip.

5,588,296

FUSION HEAT RECOVERY AND COMBUSTION GASES FILTERING SYSTEM WITH ELECTRIC POWER PRODUCTION

Antonio N. Aparici, Villafames, Spain, assignor to Colorobbia Espana, S.A., Villafames, Spain

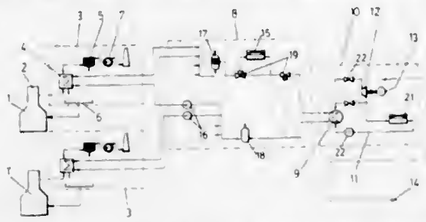
Filed Dec. 20, 1994, Ser. No. 359,906

Claims priority, application Spain, Dec. 20, 1993, 9302634

Int. Cl.[6] F01K *25/00*

U.S. Cl. 60—671 **3 Claims**

1. A fusion heat recovery and combustion gases filtering system



with electric power production, applicable to a ceramic enamelling plant and the like having a plurality of ovens (1), the system comprising a plurality of operative filter units (3), each operative filtering unit (3) of said plurality including a filter (5), an input heat exchanger (4) receiving fumes from a respective oven to cool the fumes down to an appropriate temperature for filtering the fumes in said filter, said filter being selected from a group consisting of a textile bag and a cap filter in which a powder enamel is recovered to be sent back to the respective oven (1) and hence recycled; a heat transmitting circuit (8) coupled to input exchangers (4) of all operating filtering units (3) of said ovens to receive hot heat transmission fluid from and send cooled heat transmission fluid to said input heat exchangers (4); and an organic cycle power plant (10), the operative filtering units (3) cooperating with the respective ovens (1) having input heat exchangers (4) thereof connected in parallel to said heat transmitting circuit (8) wherein a second exchanger (9) is provided that works as an output exchanger for transmitting heat received from said hot heat transmission fluid from said input heat exchangers (4) and absorbed thereby to said organic cycle power plant (10) which generates electric power.

5,588,297

THERMAL POWER GENERATOR

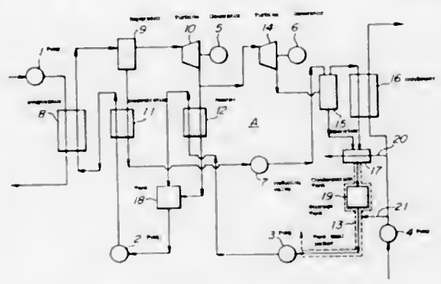
Haruo Uehara, and Yasuyuki Ikegami, both of Saga, Japan, assignors to Saga University, Saga, Japan

Filed Jun. 7, 1994, Ser. No. 255,968

Claims priority, application Japan, Sep. 22, 1993, 5-236432

Int. Cl.[6] F01K *25/06*

U.S. Cl. 60—673 **6 Claims**



2. A thermal power generator comprising:

a high heat source pump supplying a high heat source fluid;

first and second cold working fluid pumps each pumping a cold working fluid;

an evaporator receiving the high heat source fluid from said high heat source pump, and a warmed working fluid, the high heat source fluid being heat-exchanged with the warmed working fluid to form a vapor-liquid working fluid;

a liquid-vapor separator connected to said evaporator and receiving the vapor-liquid working fluid therefrom, said liquid-vapor separator separating the vapor-liquid working fluid into a vapor working fluid and a liquid working fluid;

a turbine and generator, said turbine being connected to said liquid-vapor separator and receiving the vapor working fluid therefrom, said turbine discharging the vapor working fluid received therein through two separate branches;

a heater connected to said turbine using one of the branches, and receiving a portion of the vapor working fluid discharged from said turbine, said heater further receiving the cold-working fluid from said second cold working fluid pump, the vapor working fluid being heat-exchanged with the cold working fluid to warm the cold working fluid, and cool and condense the vapor working fluid, said heater discharging the working fluids received therein;

means for storing and mixing the working fluids discharged from said heater to form a stored working fluid, and supplying the stored working fluid to said first cold working fluid pump;

a regenerator receiving the liquid working fluid from said separator, and the cold working fluid from said first cold working fluid pump, said regenerator heat-exchanging the liquid working fluid with the cold-working fluid to change the liquid working fluid into a regenerated working fluid, and the cold working fluid into the warmed working fluid, the warmed working fluid being discharged to said evaporator;

an absorber connected to said turbine using the other one of the branches, and to said regenerator for heat-exchanging and mixing the regenerated working fluid with the remaining vapor working fluid received from said turbine;

a low heat source pump supplying a low heat source fluid;

condensation means connected to said absorber, and receiving the low heat source fluid from said low heat source pump for forming the cold-working fluid;

a storage tank connected to said condensation means for storing the cold-working fluid; and

means for supplying the cold working fluid from said storage tank to said second cold working fluid pump.

5,588,298

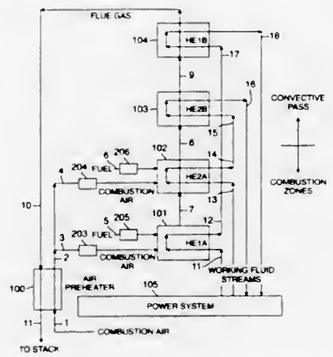
SUPPLYING HEAT TO AN EXTERNALLY FIRED POWER SYSTEM

Alexander I. Kalina, Hillsborough, and Mark D. Mirolli, Hayward, both of Calif., assignors to Exergy, Inc., Hayward, Calif.

Filed Oct. 20, 1995, Ser. No. 546,419

Int. Cl.[6] F01K *13/00*

U.S. Cl. 60—676 **22 Claims**



1. A method for supplying heat to an externally fired power system that includes the steps of:

supplying a first stream of air and a first portion of total amount of combustion fuel to a first combustion zone,

combusting said first portion of fuel in said first combustion zone to form a first flue gas stream,

transferring heat from said first combustion zone to a first working fluid stream from said externally fired power system in first heat exchanger conduits located within said first combustion zone, an amount of fuel and air supplied to the first combustion zone being adjusted to control the first combustion zone temperature to a first predetermined value,

supplying said first flue gas stream, a second stream of air, and a second portion of the total amount of combustion fuel to a second combustion zone,

combusting said second portion of fuel in said second combustion zone to form a second flue gas stream, and

transferring heat from said second combustion zone to a second working fluid stream from said externally fired power system in second heat exchanger conduits exposed located within said second combustion zone, said second working fluid stream being independent of said first working fluid stream, an amount of fuel and air supplied to the second combustion zone being adjusted to control the second combustion zone temperature to a second predetermined value.

5,588,299

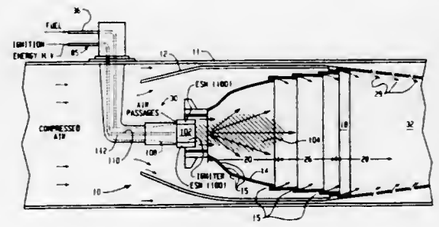
ELECTROSTATIC FUEL INJECTOR BODY WITH IGNITER ELECTRODES FORMED IN THE HOUSING

Dennis M. DeFreitas, Oxford, N.Y., assignor to Simmonds Precision Engine Systems, Inc., Akron, Ohio

Division of Ser. No. 67,652, May 26, 1993, Pat. No. 5,515,681. This application Jun. 6, 1995, Ser. No. 470,521

Int. Cl.[6] F02C *7/266*

U.S. Cl. 60—740 **18 Claims**



1. A flame injector for initiating combustion of a main air/fuel supply to a combustor, comprising: a housing having a body with an orifice at an end thereof; an electrostatic nozzle connectable to a fuel supply, said nozzle disposed in said housing and that produces an electrostatically atomized fuel spray into said orifice; and an igniter disposed at said orifice to ignite said electrostatically atomized fuel spray; said igniter comprises two electrodes formed in said housing about an external surface of said body that defines said orifice, said electrodes being electrically insulated from each other.

5,588,300

THERMOELECTRIC REFRIGERATION SYSTEM WITH FLEXIBLE HEATCONDUCTING ELEMENT

Stefan Larsson, Sjömansgatan 17 D, Göteborg, Sweden, and Christer Tennstedt, Smedjegatan 14, Gävle, Sweden

PCT No. PCT/SE92/00687, § 371 Date Apr. 1, 1994, § 102(e) Date Apr. 1, 1994, PCT Pub. No. WO93/07426, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 211,396

Claims priority, application Sweden, Oct. 4, 1991, 9102875

Int. Cl.[6] F25B *21/02*

U.S. Cl. 62—3.61 **10 Claims**

1. A refrigeration device for use on a boat comprising a room for keeping objects, a thermo-electric cooling element having a first end connected by a first heat conducting element to said room, and a second end connected to a second heat conducting element that is adapted to be thermally coupled with water surrounding the boat for exchange of heat therewith and wherein at least one of the heat conducting elements includes a flexible heat conducting element formed by a plurality of flexible thin wires of a material with a high thermal conductivity, and further comprising a first thermostat means for detecting the temperature in said room and a second thermostat means arranged to detect the temperature of the second heat conducting element at a potion of the element that connects to said thermo-electric cooling element and regulation means for regulating operation of the thermo-electric cooling element in response to said detected temperature information and temperature differences between said first and second thermostat means.

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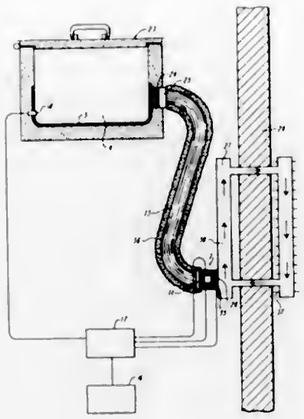


5,588,301

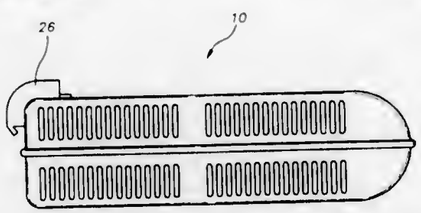
AIR SCOOP AND METHOD OF USE WITH ROOF MOUNTED VEHICLE AIR CONDITIONER

Gerald J. Deroche, Sr., 231 Saint Anthony St., Luling, La. 70070

Filed Jul. 24, 1995, Ser. No. 506,399

Int. Cl.[6] B60H *1/32*

U.S. Cl. 62—61 **4 Claims**



1. A method of increasing the cooling effect of roof mounted air conditioners of the type having a condenser air intake located on a rear sidewall of said air conditioner, said method comprising the steps of:

1) providing a scoop member having an inlet and an outlet aperture connected via a conduit having between a seventy and a one-hundred-ten degree bend therein, said outlet aperture having a length measuring between seventy and one-hundred-twenty percent of a length of said condenser air intake; and

2) securing said scoop member to said air conditioner in a manner such that said inlet aperture of said scoop member is directed toward a front of said air conditioner and said outlet aperture is directed toward said condenser air intake.

5,588,302

CAR AIR CONDITIONER

Yoshitaka Suzuki; Masako Kondo, both of Wakoh; Takashi Endo; Toshihiro Zama, both of Yamato; Yuji Shimoda, and Hiroshi Takata, both of Yokohama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Stanley Electric Co., Ltd.

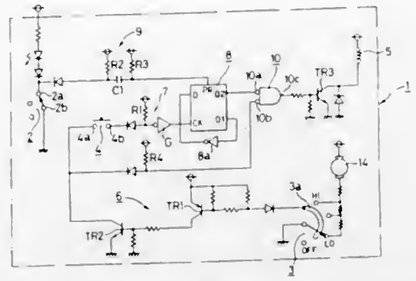
Filed May 22, 1995, Ser. No. 445,923

Claims priority, application Japan, May 23, 1994, 6-130851

Int. Cl.[6] B60H *1/00*

U.S. Cl. 62—161 **1 Claim**

1. A car air conditioner comprising:



a D flip-flop circuit having a reset terminal, a clock terminal and an inverted output terminal,

an outlet vent selection switch having a defroster contact,

a flow rate control switch having a compressor contact for generating an L-logical value when closed, and

a push-on type AC switch,

characterized in that said AC switch is urged by the L-logical value generated when said compressor contact of said flow rate control switch is closed and at the same time connected to the clock terminal of said D flip-flop circuit by way of a rise shaping circuit, that the defroster contact of said outlet vent selection switch is connected to said reset terminal of said D flip-flop circuit by way of a pulse shaping circuit for generating a pulse when said defroster contact is selected and that the inverted output terminal of said D flip-flop circuit is connected to an AC relay by way of a NOR-gate for calculating the logical sum of the L-logical values generated when said compressor contact is closed.

5,588,303

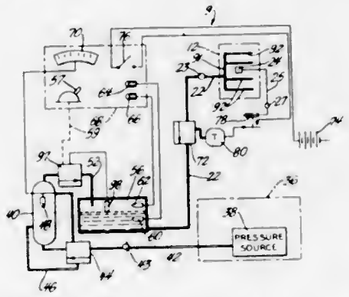
ARMORED VEHICLE SURFACE COOLING SYSTEM

Jeffery S. Parks, 21727 Harper Lake Ave., St. Clair Shores, Mich. 48080

Filed Aug. 22, 1995, Ser. No. 521,378

Int. Cl.[6] F28D *3/00*; **F02M** *23/14*

U.S. Cl. 62—171 **9 Claims**



1. A semi-passive cooling system for an armored vehicle, comprising:

an intermittent pressure source on the vehicle;

means for storing pressurized fluid from the pressure source, the storing means comprised of a vessel downstream of the pressure source;

a first valve connected between the pressure source and the vessel;

first means to open the first valve in response to a predetermined pressure fall in the vessel;

a reservoir containing water;

a second valve connected between the vessel and the reservoir;

means for stabilizing pressure in the reservoir at a pressure lower than a pressure in the vessel, the stabilizing means including means to actuate the second valve in response to a predetermined pressure level in the reservoir;

a sheet of water-absorbent, wicking skin on an exterior zone of the vehicle;

means for causing releasable mechanical adhesion between the sheet and the zone;

means for feeding water from the reservoir to the sheet;

the feeding means including a third valve;

means for supplying power to the third valve;

means attached to the sheet for distributing water from the feeding means throughout the sheet;

a releasable fluid connection between the feeding means and the distributing means;

a heat sensor between the sheet and the zone;

a switch between the supplying means and the third valve, the switch responsive to a signal from the heat sensor.

5,588,304

TRIGGER FOR REGENERATIVE SUBSTANCES AND REGENERATIVE BODY WITH THE TRIGGER

Yasuhiko Koiso; Yoshiki Matsumoto; Masayuki Fujisawa, and Isao Nagatsu, all of Tokyo, Japan, assignors to Japan Pionics Co., Ltd., Tokyo, Japan

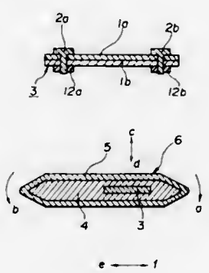
Continuation of Ser. No. 267,391, Jun. 29, 1994, abandoned.

This application Sep. 13, 1995, Ser. No. 527,501

Claims priority, application Japan, Jun. 30, 1993, 5-183486; Sep. 22, 1993, 5-259261

Int. Cl.[6] F25C *1/00*

U.S. Cl. 62—340 **20 Claims**



1. A trigger for regenerative substances which terminates the supercooled state of the regenerative substances, comprising:

a stimulating means which, when physically manipulated, applies a physical stimulus to the regenerative substances when necessary to terminate the supercooled state of said regenerative substances, causing the regenerative substances to freeze and to radiate a latent heat, and which otherwise does not apply a physical stimulus to said regenerative substances,

wherein said stimulating means includes a stimulator which is formed by placing a plurality of flat elastic elements in a manner such that one side of each of these elastic elements opposes a side of another of the elastic elements, and

wherein said elastic elements can move in close contact with each other in a manner which comprises a sliding frictional movement.

5,588,305

AIR CONDITIONING SYSTEM FOR A VEHICLE

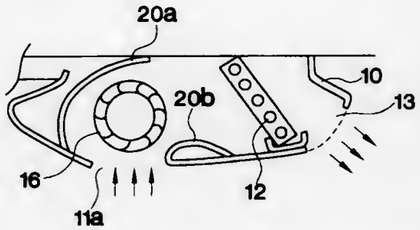
Hwan-Oh Sim, Kyungsangnam-Do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea

Filed Jun. 2, 1995, Ser. No. 458,873

Claims priority, application Rep. of Korea, Jun. 3, 1994, 94-12955

Int. Cl.[6] F25D *17/06*

U.S. Cl. 62—419 **5 Claims**



1. An air conditioning system for a vehicle, said air conditioning system comprising:

a unit case;

a pair of blow fans and corresponding blow motors disposed within said unit case;

an evaporator disposed at a forward space of said unit case and at an exhaust side of said pair of blow fans;

an upper blow case and a lower blow case disposed around each of said pair of blow fans, respectively, said lower blow case including an initial semispherical protrusion formed therein and said upper blow case including an arcuate portion complementary in shape to the semispherical protrusion;

an air inlet disposed at a lower space of each of said pair of blow fans and formed within said lower blow case for effectively intaking the fresh air therethrough and directing the intake air vertically at said pair of blow fans; and

an air outlet disposed at a side of said evaporator opposite to said pair of blow fans, whereby the air conditioning system provides a clean condition since the semispherical protrusion prevents dust from settling on a floor surface of the lower blow case, and effectively supplies fresh air through the air inlet.

5,588,306

PROCESS FOR OBTAINING AN ETHANE-RICH FRACTION FOR REFILLING AN ETHANE-CONTAINING REFRIGERANT CIRCUIT OF A PROCESS FOR LIQUEFACTION OF A HYDROCARBON-RICH FRACTION

Hans Schmidt, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Nov. 9, 1995, Ser. No. 556,191

Claims priority, application Germany, Nov. 11, 1994, 44 40 407.7

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—614 **17 Claims**

1. A process for obtaining an ethane-rich fraction and refilling a refrigerant circuit for liquefaction of a hydrocarbon-rich fraction, said process comprising:

cooling and liquefying a hydrocarbon-rich fraction by heat exchange against an ethane-containing refrigerant circulated in a refrigerant circuit;

removing a partial stream of liquefied hydrocarbon-rich fraction and supplying said partial stream to a $C_1/C_2/C_{3+}$ separation column;

withdrawing an ethane-rich fraction from said $C_1/C_2/C_{3+}$ separation column; and

optionally after intermediate storage in a buffer tank, introducing said ethane-rich fraction to said refrigerant circuit.

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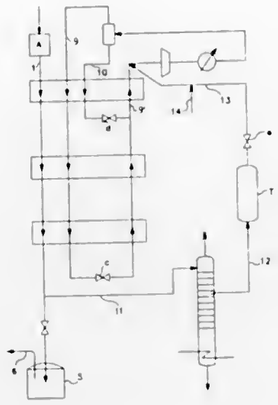
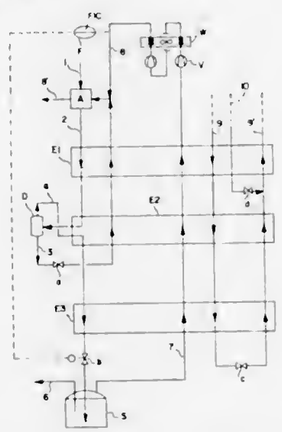
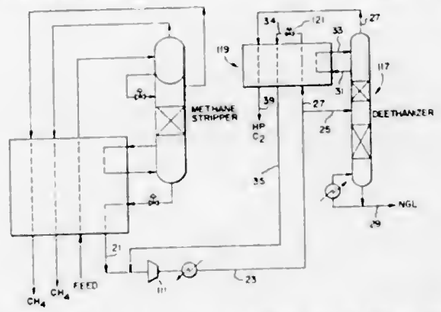


5,588,307
PROCESS FOR LIQUEFACTION OF A PRESSURIZED HYDROCARBON-RICH FRACTION
Hans Schmidt, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Germany
Filed Nov. 9, 1995, Ser. No. 556,192
Claims priority, application Germany, Nov. 11, 1994, 44 40 406.9
Int. Cl.[6] F25J *1/00*
U.S. Cl. 62—614 **21 Claims**



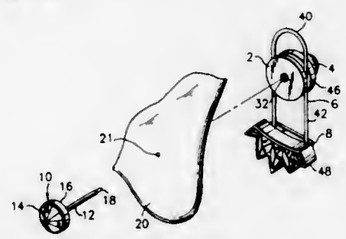
1. A process for liquefaction of a pressurized gas stream containing hydrocarbons comprising:
cooling and liquefying a pressurized hydrocarbon-rich gas stream by heat exchange with process streams to be heated,
expanding the resultant liquefied stream by means of at least one expansion means into at least one storage tank, and
removing flash gas/boil-off gas stream from said at least one storage tank and compressing said flash gas/boil-off gas stream in at least one compression stage,
wherein throughput of said flash gas/boil-off gas stream in said at least one compression stage is kept constant by controlling the position of said at least one expansion valve or expansion turbine by an FIC controller,
whereby pressure immediately downstream of said at least one expansion means is maintained substantially constant.

5,588,308
RECOMPRESSION CYCLE FOR RECOVERY OF NATURAL GAS LIQUIDS
Tamara L. Daugherty, Allentown, and Christopher F. Harris, Old Zionsville, both of Pa., assignors to Air Products And Chemicals, Inc., Allentown, Pa.
Filed Aug. 21, 1995, Ser. No. 517,524
Int. Cl.[6] F25J *3/02*
U.S. Cl. 62—622 **11 Claims**



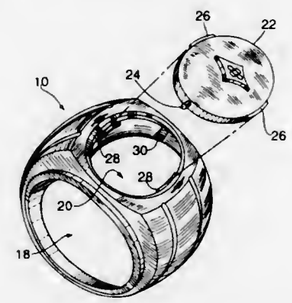
1. A method for the recovery of hydrocarbons heavier than methane from mixtures of methane and said hydrocarbons which comprises:
(a) cooling and partially liquefying a compressed natural gas feed stream containing methane and said hydrocarbons;
(b) separating the resulting partially condensed feed stream into a methane-rich vapor and a first liquid;
(c) introducing said first liquid into a stripping column which operates at or below the pressure of said partially condensed feed stream;
(d) recovering from said stripping column a methane-rich overhead vapor and a stripper bottoms liquid rich in said hydrocarbons heavier than methane; and
(e) expanding said stripper bottoms liquid and vaporizing the resulting expanded stream by indirect heat exchange with said compressed natural gas feed stream, thereby providing at least a portion of the cooling for said compressed natural gas feed stream in step (a) and yielding a vaporized stripper bottoms stream rich in said hydrocarbons heavier than methane.

5,588,309
EARRING BACK ADAPTER
Joseph J. Chioffe, 2710 Neaton Ct., Wellington, Fla. 33414
Filed Jul. 5, 1995, Ser. No. 498,137
Int. Cl.[6] A44C *7/00*
U.S. Cl. 63—12 **1 Claim**



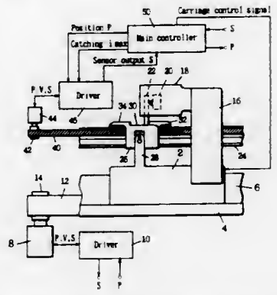
1. An earring back adapter comprising:
a first ornament holder having a friction post;
a back clutch with a central opening to accomodate and hold said friction post of said first ornament holder;
a back clutch adapter having a central opening through which said friction post of said first ornament holder may pass, said back clutch adapter having a base portion, a top disk and a central stem that define a channel, and said top disk of said back clutch adapter having a depressed receiving area for frictional engagement and securement of said back clutch;
a bridge consisting of a bent spring wire having a U-shape and long ends of said bent spring wire passing through said channel defined in said back clutch adapter, and said back clutch adapter being moveable along said spring wire of said bridge mechanism, bottom ends of said bent spring wire being bent outward to define feet; and,
a second ornament holder connected to said ends of said bent spring wire of said bridge mechanism, wherein said feet at the bottoms of said bent spring wire are held under tension within openings in said second ornament holder.

5,588,310
JEWELRY WITH CHANGEABLE ORNAMENTATION
Danny S. Lai, New York, N.Y., assignor to Gramercy Enterprises (U.S.A.) Corp., New York, N.Y.
Filed Aug. 18, 1995, Ser. No. 516,131
Int. Cl.[6] A44C *9/00*
U.S. Cl. 63—15 **6 Claims**



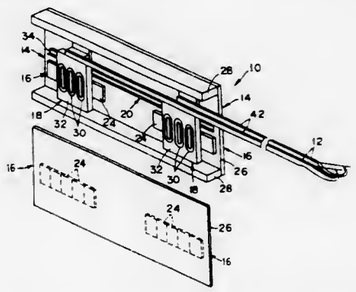
1. An item of jewelry with changeable ornamentation, comprising:
a body portion including an opening therein, two vertical slots at opposite sides of said opening, and two platform members; and
an ornament piece having a plurality of display surfaces including a first display surface on one side thereof and a second display surface on another side thereof, said ornament piece being rotatably mounted in said body portion such that said ornament piece is rotatable between a first display position in which said first display surface is displayed through said opening in said body portion and a second display position in which said second display surface is displayed through said opening in said body portion, said ornament piece including two pins extending from opposite sides thereof defining an axis about which said ornament piece is rotatable, said pins being rotatably and slidably mounted in said slots of said body portion,
wherein said ornament piece includes two locking projections extending therefrom adapted to engage said platform members of said body portion to releasably lock said ornament piece in one of said first and second display positions and thereby restrain said ornament piece from movement with respect to said body portion, and
wherein said locking projections or said platform members or both are resiliently deformable such that said locking projections can be forced out of engagement with said platform members to free said ornament piece for sliding movement with respect to said body portion such that said ornament piece can be slidably moved away from said opening to enable said platform members and said projections to be sufficiently spaced from each other to enable generally free rotation of said ornament piece to change display positions.

5,588,311
CONTROL METHOD FOR A CARRIER OF A KNITTING MACHINE AND ITS APPARATUS
Takeshi Kiribuchi, Wakayama, Japan, assignor to Shima Seiki Manufacturing Ltd., Wakayama, Japan
Filed Oct. 30, 1995, Ser. No. 550,099
Claims priority, application Japan, Oct. 31, 1994, 6-292443
Int. Cl.[6] D04B *15/56*
U.S. Cl. 66—60 R **6 Claims**



1. A control method for a carrier of a knitting machine, wherein the knitting machine includes at least a carriage for driving the needles of at least a needle bed and at least a carrier for feeding yarn to the needle bed, and wherein the carriage is driven by a first servo motor and the carrier is driven to travel on a carrier rail by a second servo motor, the method comprising figuring a pin of a carrier catching apparatus connected to the carriage configured to engage with the carrier so as to catch the carrier by the carriage and providing a torque limiting means coupled to said second servo motor such that, during the catching, an output torque of the second servo motor is limited by the torque limiting means.

5,588,312
DRIVING APPARATUS FOR NEEDLES OF KNITTING MACHINE
Seishiro Hashimoto, Ishikawa-ken, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, and Kyowa Denki Kogyo Kabushiki Kaisha, both of Japan
Filed Dec. 8, 1995, Ser. No. 569,493
Claims priority, application Japan, Dec. 14, 1994, 6-332358
Int. Cl.[6] D04B *15/00*
U.S. Cl. 66—75.2 **7 Claims**



1. A driving apparatus for needle of a knitting machine, comprising a linear motor for reciprocally moving said needle, said linear motor including:
a pair of stator assemblies opposed to each other with a space left therebetween in the horizontal direction, each of stator assemblies having first magnet means thereon;

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a moving assembly having second magnet means and disposed vertically between said stator assemblies so as to move in a direction of movement of the needle;

coupling means for supporting said moving assembly on at least one of said stator assemblies at a location either above or below a position at which said second magnet means is arranged; and

a position sensor for detecting a position of said moving assembly with respect to said stator assemblies.

5,588,313

AUTOMATIC WASHING MACHINE FITTED FOR DRYING

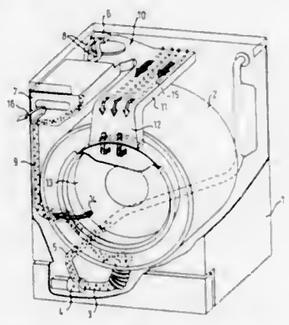
Gerald Hildebrand, Berlin, Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Germany

Filed Oct. 13, 1995, Ser. No. 542,671

Claims priority, application Germany, Oct. 13, 1994, 44 36 673.6

Int. Cl.[6] D06F *25/00;39/02*

U.S. Cl. 68—17 R **13 Claims**



1. An automatic front-loading washing machine, comprising:

a tub having a lower portion, a lowest point and a fill opening with an air inlet neck;

a tub drain connected to said lowest point of said tub;

a detergent dispenser having a multiplicity of chambers;

a detergent supply line leading into said lower portion of said tub;

a closed air recirculation circuit being associated with said tub for drying and including a waste air conduit leading out of said tub and having a condensation device, a blower, a heating conduit, and an air inlet conduit opening into said air inlet neck to said fill opening of said tub;

said waste air conduit and said detergent supply line being one component; and

dehumidified waste air being carried outside said chambers through said detergent dispenser to said blower.

5,588,314

SECURITY GATE LOCK ASSEMBLY

Anthony D. Knezovich, P.O. Box 1166, Rock Spring, Wyo. 82902

Filed Dec. 27, 1995, Ser. No. 580,437

Int. Cl.[6] E05B *67/38*

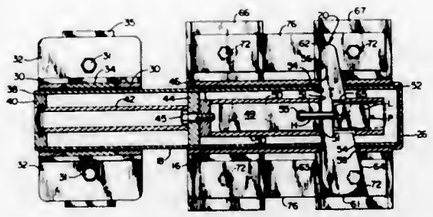
U.S. Cl. 70—56 **14 Claims**

1. A gate lock assembly adapted for releasably locking a gate to a fixed vertical support comprising:

a bolt receiver for being fixed to one of said gate and said support; and

a locking bolt assembly for being mounted on the other of said gate and said support including:

(a) a fixed mounting tube;



(b) a slidable locking bolt extending through said mounting tube for slidable movement between an extended locking position in which one end of said locking bolt is disposed in said receiver and a retracted, unlocked position in which said one end is removed from said receiver;

(c) a locking wedge extending through aligned slots in said mounting tube and said locking bolt when said locking bolt is in the extended position; and

(d) a locking-member for releasably engaging said wedge when said wedge is positioned in said aligned slots whereby when said locking member is locked said wedge is restrained against movement through said aligned slots and said locking bolt is retained in the extended locking position.

5,588,315

SAFETY DEVICE FOR A BOX

Bertil Holmgren, Vellinge, Sweden, assignor to M W Trading APS, Denmark

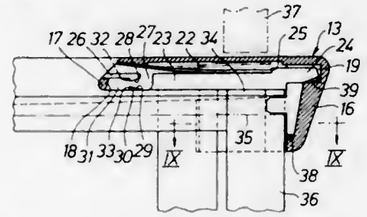
PCT No. PCT/SE93/00241, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO93/19268, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 23, 1993, Ser. No. 307,748

Claims priority, application Sweden, Mar. 24, 1992, 9200902

Int. Cl.[6] E05B *65/00*

U.S. Cl. 70—57.1 **6 Claims**



1. A safety device for a box, comprising:

a frame, said frame being adapted to conform to dimensions of the box, said frame including an insert opening for inserting the box in the frame;

a blocking element for blocking the insert opening, the blocking element being movable between a first engaged position, where the insert opening is blocked, and a second disengaged position where the insert opening is not blocked;

means for slidably and pivotally mounting the blocking element to said frame, said mounting means being connected to said frame;

restraining means for preventing pivotal movement of the blocking element when the blocking element is in the first engaged position, the restraining means being connected to the frame;

a latch operatively connected to the blocking element for selectively releasing the blocking element, the latch being movable between a first position where the blocking element cannot be displaced and remains engaged, whereby the insert opening is blocked, and a second position where the blocking element can be displaced and disengaged, whereby the insert opening is unblocked; and

wherein said latch comprises:

a spring blade fixedly attached at one end thereof to the blocking element; and

a shoulder on said frame, said spring blade engaging said shoulder in said first position thereof to prevent sliding motion of said blocking element.

5,588,316

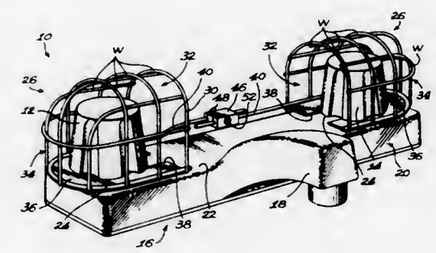
LOCKING DEVICE FOR SELECTIVELY PREVENTING ACCESS TO THE VALVE HANDLES OF A DOMESTIC WATER TAP

Steven Jones, 96, Domaine Montaubois, R.R. 1, Mont Rolland, J0R 1G0, Canada

Filed Apr. 4, 1995, Ser. No. 422,086

Int. Cl.[6] F16K *35/10*

U.S. Cl. 70—178 **5 Claims**



1. A locking device for selectively preventing access to the valve handles of a domestic water tap, said locking device comprising:

a pair of substantially hollow handle enclosing components, each one of said handle enclosing components having a substantially concave-shaped wall, each one of said substantially concave-shaped walls defining a peripheral edge, each one of said peripheral edges defining an aperture, said handle enclosing components being positioned so that said apertures face one another, each one of said substantially hollow handle enclosing components being configured and sized in order to receive one of said valve handles,

a pair of substantially rigid connecting rods, each one of said substantially rigid connecting rods extending substantially outwardly from one of said peripheral edges,

a locking means for releasably locking said substantially rigid connecting rods together.

5,588,317

METHOD AND APPARATUS FOR SEQUENTIALLY UNLOCKING COMPARTMENTS

James S. Bianco, 217 Brainard Rd., Enfield, Conn. 06082

Filed Feb. 9, 1995, Ser. No. 386,153

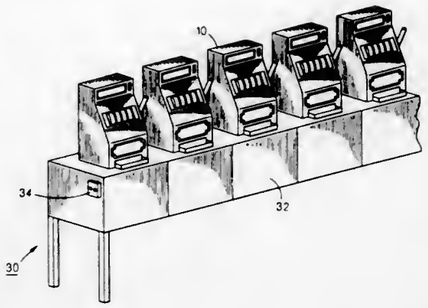
Int. Cl.[6] E05B *53/00*

U.S. Cl. 70—265 **6 Claims**

1. An apparatus for sequentially unlocking a series of locked compartments, comprising:

(a) means to unlock a first one of said locked compartments so that said first one of said locked compartments can be opened and then closed; and

(b) means to sense closing of said first one of said locked compartments and to automatically unlock a second one of said locked compartments in response to said closing of said first one of said locked compartments.



5,588,318

DOOR LOCK

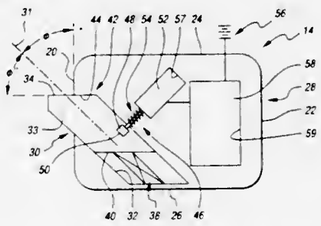
Shelby M. Osborne, Lexington, Ky., assignor to FireKing International, Inc., Lexington, Ky.

Filed Jul. 23, 1992, Ser. No. 917,592

The portion of the term of this patent subsequent to Dec. 19, 2012, has been disclaimed.

Int. Cl.[6] E05B *17/00*

U.S. Cl. 70—469 **7 Claims**



1. A door lock device for selectively locking and unlocking a door, the door lock device comprising:

a door latch mechanism, a casing and an elongate lock bolt;

the door latch mechanism including a lock bolt abutment surface;

a casing having a lock bolt receiving channel with a lock bolt receiving aperture slidably receiving the lock bolt in the channel and further comprising biasing means for resiliently biasing the lock bolt in the channel toward the bolt-receiving aperture, the channel having a closed end with the biasing means being captured between the closed end and the lock bolt, the casing to be attached to a door with the bolt-receiving aperture facing the door latch mechanism;

the lock bolt having a projecting end with an abutment face at the projecting end thereof at an acute angle to the longitudinal axis of the lock bolt;

first bolt stop means cooperating with the abutment face of the lock bolt to limit sliding movement of the lock bolt toward the bolt-receiving aperture so that the lock bolt projects through the bolt-receiving aperture a predetermined distance defining a locking position of the lock bolt, the first bolt stop means comprises a shelf extending between one edge of the bolt-receiving aperture and one longitudinal side of the lock bolt-receiving channel; and

second bolt stop means selectively cooperating with the lock bolt when the lock bolt is in the locking position to prevent sliding movement of the lock bolt to an unlocking position, the second bolt stop means further comprising means defining a notch in the lock bolt, a pin movable into and out of the notch, and means for selectively moving the pin into and out of the notch;

the lock bolt slidably mounted within the casing for movement at an acute angle relative to the bolt abutment surface of the

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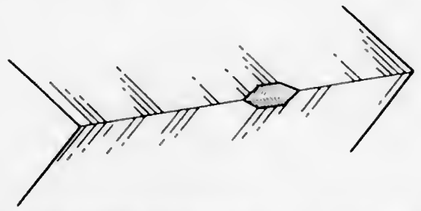
door latch mechanism between a locking position whereat the projecting end of the lock bolt projects through the bolt-receiving aperture and into abutting relationship with the bolt abutment surface of the door latch mechanism, and an unlocking position whereat the lock bolt is retracted into the casing, the lock bolt being responsive to abutment by the lock bolt abutment surface of the door latch mechanism to retract into the casing.

5,588,319

METHOD AND APPARATUS FOR MAKING HEAT EXCHANGER FINS

Sabatino A. Bianchi, Bloomfield Hills, and Richard P. Stoynoff, Woodhaven, both of Mich., assignors to Livernois Research & Development Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 170,720, Dec. 21, 1993, abandoned. This application Nov. 7, 1995, Ser. No. 554,542
Int. Cl.[6] B21D *37/01;53/06*
U.S. Cl. 72—186 **9 Claims**



1. A heat exchange fin manufacturing tool for forming a strip of fins with louvers comprising

fin forming rolls including stacked carbide plates having edges for rolling, cutting and forming fins with louvers that are cut and twisted so that they project from each fin, the tool having the characteristic of enhanced wear resistance, each edge having

a primary cutting surface for rolling, cutting, and forming fins before localized brittle fracture occurs during service life; and

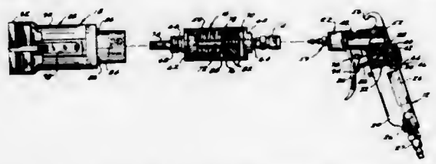
a secondary cutting edge extending from the primary cutting edge as a result of localized brittle fracture after exposure to service conditions, the secondary cutting edge continually replacing the primary cutting edge in a self-rejuvenated manner with renewed rolling, cutting, and forming ability.

5,588,320

CORNERBEAD CRIMPING TOOL

Guy Lallier, 3837 Coco Plum, Circle, Karanda Village 3, Pompano Beach, Fla. 33063

Continuation-in-part of Ser. No. 513,987, Apr. 24, 1990, Pat. No. 5,209,097, which is a continuation-in-part of Ser. No. 448,737, Dec. 11, 1989, abandoned. This application Dec. 20, 1991, Ser. No. 811,782
Int. Cl.[6] B23P *11/00*
U.S. Cl. 72—325 **19 Claims**



1. A modular tool kit for crimping profiled cornerbead, wherein said cornerbead is available in a plurality of different profiles, comprising:

(1) a housing module comprising a housing module body extending longitudinally from a front end to a back end and defining a longitudinal bore therethrough;

(2) a plurality of interchangeable crimper modules, each of said crimper modules comprising;

(a) guide means, having a profiled guide surface complimentary to a respective profiled cornerbead, for receiving the respective profiled cornerbead;

(b) attachment means for releasably securing guide means to said front end of said housing module;

(c) articulated crimper arm means, for crimping a respective profiled cornerbead received in the guide means wherein said crimper arm means comprises a pair of opposed crimper blades, pivotably mounted on said guide means and said crimper arm means, having an open position wherein said opposed blades are pivotably displaced apart from each other and having a crimping position wherein said crimper blades are pivotably displaced toward each other; and

(d) lug means, pivotably connected to said articulated crimper arm means and slidably receivable within the longitudinal bore of the housing module, for mounting said arms between said open and crimping positions;

(3) a plurality of interchangeable power modules, each of said power modules comprising;

(a) a power module body;

(b) means for releasably securing said power module body to said back end of said housing module;

(c) actuator means, longitudinally displaceable relative to said power module body and releasably securable to said articulated crimper arm means; and

(d) transducer means for receiving energy input and for translating said energy input into longitudinal movement of said actuator means;

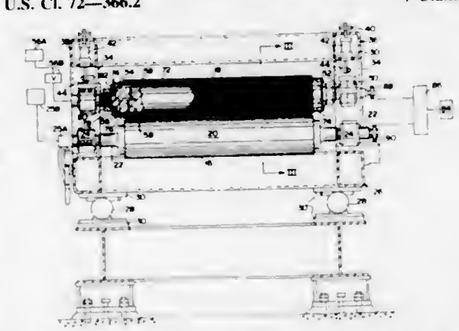
wherein said power module comprises a manual power module, wherein the actuator means of said manual power module comprises a rod, wherein the transducer means of said manual power module comprises a plunger slidably mounted within the manual power module and wherein energy is input to said manual power module by applying impact energy to said plunger.

5,588,321

SEGMENTED SCRIBING ROLLER FOR REFINING THE DOMAIN STRUCTURE OF ELECTRICAL STEELS BY LOCAL MECHANICAL DEFORMATION

Ralph E. Snyder, Export; Dominic A. Sorace, Sarver, and James G. Benford, Pittsburgh, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Division of Ser. No. 378,891, Jan. 25, 1995, Pat. No. 5,463,889. This application Jun. 26, 1995, Ser. No. 494,475
Int. Cl.[6] B21B *1/22*
U.S. Cl. 72—366.2 **7 Claims**



1. A method for refining the magnetic domain wall spacing of a grain-oriented silicon steel strip, said method including the steps of:

subjecting the strip to be scribed to a rolling contact pressure area formed while the strip is moving between a segmented scribing roller means and a rotatable anvil roll means; and

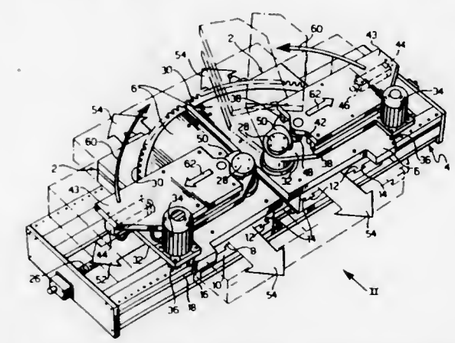
imposing a uniform mechanical deformation transversely of said strip within said rolling contact pressure area by resilient support of scribing roller means segments clamped side-by-side and each having a series of outer peripheral surface projections arranged such that upon rotation about a rotational axis of the scribing roller means, the surface projections penetrate one surface of the strip independently of other scribing surface projections on other segments while the strip is supported by said anvil roll means.

5,588,322

UNIVERSAL SUPPORT AND POSITIONING STRUCTURE FOR TOOLS USED BY AN ELONGATE ELEMENT BENDING MACHINE

Carlo Passone, Vinovo, Italy, assignor to Bending Tooling S.R.L., Vinovo, Italy

PCT No. PCT/EP93/00813, § 371 Date Dec. 7, 1994, § 102(e) Date Dec. 7, 1994, PCT Pub. No. WO93/19864, PCT Pub. Date Oct. 14, 1993
PCT Filed Apr. 2, 1993, Ser. No. 313,299
Claims priority, application Italy, Apr. 6, 1992, TO92A0313
Int. Cl.[6] B21D *7/02*
U.S. Cl. 72—383 **14 Claims**



1. A universal support and positioning structure for tools useable by a machine for clamping and bending elongate elements such as tubes or profiled sections, including at least one base body and a support platform for said tools movably mounted on the base body and provided with means for rotating the support platform circumferentially with respect to a pivot fixed to the base body and characterized in that it further includes means for displacing the support platform radially with respect to the pivot contemporaneously to its rotation.

5,588,323

HAND-HELD RIVET BUCKING TOOL USING ENERGY DISSIPATIVE POLYMER

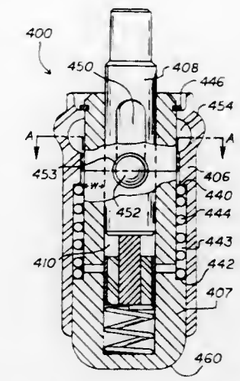
Craig Peterson, Milford, Mich., assignor to U.S. Industrial Tool and Supply, Plymouth, Mich.

Filed May 22, 1995, Ser. No. 447,198
Int. Cl.[6] B21J *9/18*
U.S. Cl. 72—465 **6 Claims**

1. A bucking tool, comprising:

a housing having an interior chamber;

an impact receiving member slidably received in said interior cavity, said member having a first end with an externally exposed impact-receiving surface and a second end terminating in a stem within said cavity; and



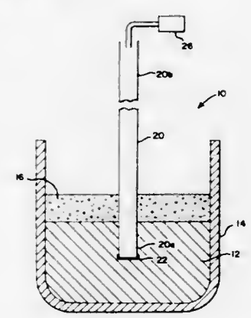
a cylindrical mass of visco-elastic energy dissipative polymer bonded around said stem, said mass defining an outer surface and circular edge oriented in opposed relation from said impact-receiving surface, said edge being retained within said interior cavity, causing said stem to move within and stretch polymer as to dissipate at least a portion of the vibration energy associated with an impact received by said member.

5,588,324

METHOD FOR DETERMINING THE LEVEL OF A SUBMERGED LAYER OF LIQUIFIED MATERIAL

Bernard E. Speranza, 9216 White Oak Ave., Munster, Ind. 46321

Filed Jun. 14, 1994, Ser. No. 259,782
Int. Cl.[6] G01F *23/00*
U.S. Cl. 73—290 R **20 Claims**



1. For a vessel containing a first layer of liquified metal having an upper metal surface, said layer of liquified metal being submerged below a contiguous second layer of slag, a method for determining the level of said upper metal surface of said first layer of liquified metal, the method comprising:

providing a tube having first and second opposing tube ends;

providing a sacrificial cap to cover said first tube end;

inserting said first tube end through said slag layer into said first layer of liquified metal;

permitting said cap to substantially disintegrate after insertion into said layer of liquified metal, such that pressure pushes a portion of said liquified metal into said tube to an internal metal level substantially equal to the level of said upper metal surface of said first layer of liquified metal while preventing entry of said slag into said tube; and

utilizing a non-invasive level gauge to determine the level of said internal metal level of said portion in said tube without

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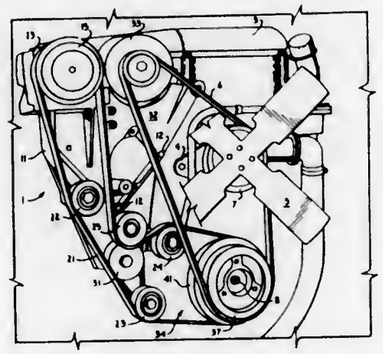
further invasion into said metal, which internal metal level substantially corresponds to the level of said upper metal surface.

5,588,325

AUXILIARY POWER TAKE OFF ASSEMBLY AND METHOD

Norman E. Green, Harper, and Kenneth V. Sowers, Kingman, both of Kans., assignors to DewEze Manufacturing, Inc., Harper, Kans.

Filed May 30, 1995, Ser. No. 453,921
Int. Cl.[6] B60K *25/02;* **F16H** *7/02*
U.S. Cl. 74—15.63 **11 Claims**



1. A PTO assembly for attachment of a rotary driven power unit to an OEM engine, said engine including a cooling fan and a fan belt which is attached between a drive pulley attached to an engine crankshaft and said cooling fan, said drive pulley including a sheave and a circular harmonic balancer positioned behind said sheave, said assembly comprising:

a. a pulley ring shrink-fit over said harmonic balancer, said pulley ring being equipped with one or more external grooves to facilitate placement and retention of a drive belt thereon; and

b. an auxiliary drive belt placed around said pulley ring and a sheave on said rotary driven power unit to thereby drive said power unit.

5,588,326

FEEDING DEVICE FOR PARTS TO BE MOUNTED

Hermann Ströter, Wuppertal; Frank Obst, Haan; Rolf Kamps, Wuppertal; Holger Reich, and Rainer Siegemund, both of Wuppertal, all of Germany, assignors to Stocko Fasteners GmbH, Wuppertal, Germany

Filed Mar. 15, 1995, Ser. No. 404,646
Claims priority, application Germany, Mar. 15, 1994, 44 08 694.6
Int. Cl.[6] A41H *37/00;* **B21J** *15/10*
U.S. Cl. 74—50 **17 Claims**

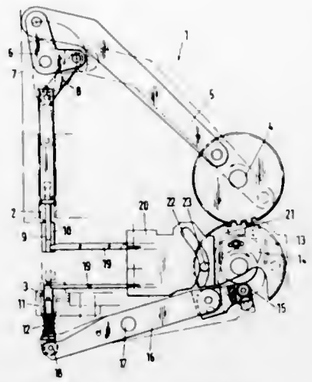
1. A feeding device for feeding parts to be mounted to at least one of an upper tool and a lower tool of a mounting machine, said feeding device comprising:

a carriage;

at least one feeding push rod connected to said carriage;

a center push crank, connected to said carriage, for moving in a reciprocating movement said carriage in a longitudinal direction of said at least one push rod to thereby move said at least one feeding push rod between an extended and a retracted position;

wherein said center push crank comprises a roller;



wherein said carriage comprises a curved guide slot; and

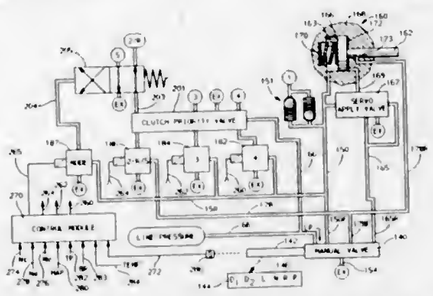
wherein said roller is positioned and guided in said curved guide slot.

5,588,327

MULTIPLEXED HYDRAULIC CLUTCH CONTROL

Robert C. Downs, Clarkston; James K. Mainquist, Troy; Larry T. Nitz, Rochester, and William L. Aldrich, III, Davisburg, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Sep. 25, 1995, Ser. No. 533,571
Int. Cl.[6] F16H *61/08*
U.S. Cl. 74—335 **5 Claims**



1. A method of overriding a hydraulic priority during a clutch-to-clutch shift in an automatic transmission having a first speed ratio controllably engaged by a first fluid operated friction device and a second speed ratio controllably engaged by a second fluid operated friction device, said first and second speed ratios having interposed therebetween a third speed ratio controllably engaged by a third fluid operated friction device, a controllable line pressure, a first solenoid fluid valve for supplying a first fluid pressure from said line pressure to one of the first and second fluid operated friction devices via a controllable multiplex valve, a second fluid valve for supplying a second fluid pressure from said line pressure to the third fluid operated friction device, a clutch priority valve hydraulically interposed between the first fluid valve and the multiplex valve responsive to a net fluid pressure comprising first and second fluid pressures effective to disengage the one of the fluid operated friction devices supplied by the first fluid pressure, the method comprising:

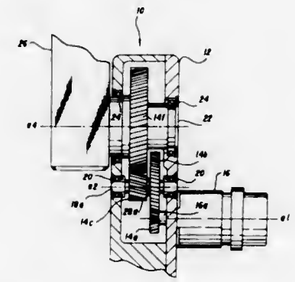
during a fill phase of one of the first and second fluid operated friction devices wherein said first and second solenoid fluid valves are simultaneously supplying fluid pressure to respective fluid operated friction devices, reducing the second fluid pressure to a value that maintains engagement of the third clutch and that ensures the net fluid pressure does not cause the clutch priority valve to disengage the one of the fluid operated friction devices supplied by the first fluid pressure.

5,588,328

GEAR MECHANISM IMPROVED TO REMOVE BACKLASH

Ryo Nihei; Akihiro Terada, both of Fujiyoshida, and Hidenori Kurebayashi, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Jul. 7, 1995, Ser. No. 499,504
Claims priority, application Japan, Jul. 8, 1994, 6-157415
Int. Cl.[6] F16H *1/00;55/18*
U.S. Cl. 74—409 **8 Claims**



1. A gear mechanism comprising:

a housing;

an input gear of helical gear supported by the housing for rotation in first and second rotational directions and adapted to be connected to a rotational power source, the input gear having tooth flanks;

an output gear of a helical gear supported by the housing for rotation, the output gear having tooth flanks;

a first gear train for transmitting the rotational power from the input gear to the output gear when the input gear rotates in the first rotational direction;

a second gear train for transmitting the rotational power from the input gear to the output gear when the input gear rotates in the second rotational direction;

the first gear train having a first spline shaft rotationally supported by the housing, first and second intermediate gears mounted on the first spline shaft slidably along the shaft, and a means for biasing first and second intermediate gears in the opposite directions along the shaft;

the first intermediate gear being biased such that when the input gear rotates in the first rotational direction, the first intermediate gear engages the input gear at the front, relative to the rotational direction of the input gear, sides of the tooth flanks of the input gear;

the second intermediate gear being biased such that when the output gear rotates in the first rotational direction, the second intermediate gear engages the output gear at the rear, relative to the rotational direction of the input gear, sides of the tooth flanks of the output gear;

the second gear train having a second spline shaft rotationally supported by the housing; third and fourth intermediate gears mounted on the second spline shaft slidably along time shaft; and a means for biasing third and fourth intermediate gears in the opposite directions along the shaft;

the third intermediate gear being biased such that when the input gear rotates in the second rotational direction, the third intermediate gear engages the input gear at the front, relative to the rotational direction of the input gear, sides of the tooth flanks of the input gear; and

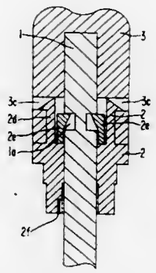
the fourth intermediate gear being biased such that when the output gear rotates in the second rotational direction, the fourth intermediate gear engages the output gear at the rear, relative to the rotational direction of the input gear, sides of the tooth flanks of the output gear.

5,588,329

SNAP TOGETHER SHIFT KNOB CONSTRUCTION

Mitsuyuki Nedachi, 16-21 Ohsugi 1-chome, Edogawa-ku, Tokyo, Japan

Filed Feb. 9, 1995, Ser. No. 386,317
Int. Cl.[6] B60K *23/00*
U.S. Cl. 74—473 R **1 Claim**



1. A mounting structure for connecting a knob to a shaft, comprising:

a rotation preventing projection formed on a side of shaft;

a first sleeve disposed on the shaft, said first sleeve having a groove for receiving said rotation preventing projection and for preventing relative rotation between the shaft and said first sleeve, said first sleeve having an annular shoulder portion from which first fastening clicks project in a spaced essentially parallel relationship with the shaft;

means defining annular recess in the shaft;

a second sleeve disposed on said shaft so as to seat on the annular shoulder, said second sleeve having second fastening clicks which engage in said annular recess and lock both said first and second sleeves axially in position on the shaft; and

means defining recesses in the walls of a bore formed in the knob into which the first clicks can engage to lock the knob on the shaft.

5,588,330

GEAR SHIFTING DEVICE WITH LOCKING DISENGAGEABLE MECHANISM MANUALLY OPERATED BY A TOOL

Yoshimasa Kataumi, and Yoshihiro Takikawa, both of Shizuoka, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1995, Ser. No. 403,058
Claims priority, application Japan, Mar. 31, 1994, 6-063480
Int. Cl.[6] B60K *17/00*
U.S. Cl. 74—483 R **12 Claims**

1. A gear shifting device comprising:

a frame;

a shifting lever provided on an underside thereof with a positioning pin and pivotably attached to said frame;

a locking member pivotably attached to said frame for preventing said positioning pin from falling when said shifting lever is in a parking position;

an actuator for operating said locking member; and

a hand-operated locking disengageable mechanism including:

a) a disengaging member slidably attached to said frame for moving said locking member to a locking-release position where the positioning pin is not locked;

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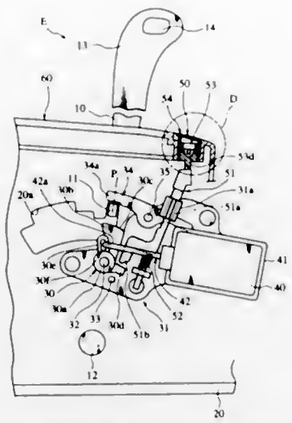


b) a core pin removably attached to said frame so as to oppose said disengaging member, said core pin being rotatable between a locked position and an unlocked position by aid of a tool;

c) a lid member removably attached to said frame so as to cover said core pin; and

d) urging means for urging said disengaging member toward said core pin,

wherein said core pin includes a cylindrical part, a flange part formed around said cylindrical part, and a pair of convex parts formed around said cylindrical part and under said flange part, and said core pin is provided inside said cylindrical part with an engagement groove for engaging with said tool, and

wherein said flange part is provided with at least one notch which is so arranged as to face one of said convex parts.

5,588,331

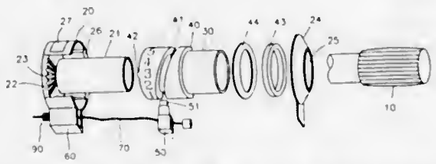
ROTARY SHIFTER FOR BICYCLE

Jack Huang, Tainan; Chung-Ping Chiang, Kaohsiung, and Chan-Hua Feng, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed Mar. 21, 1995, Ser. No. 407,565

Int. Cl.[6] F16C *1/10;* **G05G** *11/00*

U.S. Cl. 74—489 **11 Claims**



1. A rotary shifter for use with a bicycle for driving a derailleur cable to be engaged with a predetermined gear among a plurality of gears, comprising:

(a) a fixing seat mounted on a handlebar of said bicycle;

(b) a drag member for driving the derailleur cable to produce an extension thereof in response to a predetermined stroke exerted by a bicycle rider;

(c) a limit member mounted on said fixing seat for limiting said drag member to move within said predetermined stroke; and

(d) a rotary member which is mounted on said handlebar of said bicycle and is capable of rotating around an axial direction of said handlebar, said rotation of said rotary member enables a screw driving member to drive said drag member in axial movement, said screw driving member is mounted on said rotary member, such that a rotation of said rotary member causes said screw driving member to rotate, which drives said drag member to move within said stroke, and which in turn drives the derailleur cable to cause the change of engagement of the derailleur to another predetermined gear;

(e) wherein one end of said rotary member is provided with a washer, said washer is connected to a spring member while thrusting against a cover plate, and said cover plate is connected to said fixing seat so as to enable said rotary member to be limited to a specific location of said fixing seat.

5,588,332

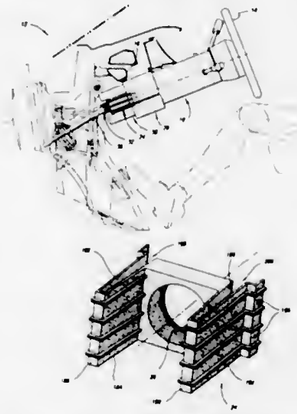
COLLAPSIBLE STEERING COLUMN ASSEMBLY

Gregory T. Hedderly, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1995, Ser. No. 414,562

Int. Cl.[6] B62D *1/19*

U.S. Cl. 74—493 **12 Claims**



1. A collapsible steering column assembly for a vehicle, comprising:

a main housing rigidly supported in the vehicle;

a lower bearing retainer connected to said main housing;

a lower steering column assembly rotatably supported with respect to said lower bearing retainer, normally axially fixed with respect to said lower bearing retainer, and including a collapsible intermediate shaft, said intermediate shaft being collapsible when said bearing retainer is not connected to said main housing; and

a telescope housing telescopically moveable with respect to said main housing, and sufficiently engageable with said bearing retainer to disconnect said bearing retainer from said main housing when sufficient load is exerted on said telescope housing, whereby to allow collapse of said intermediate shaft.

5,588,333

LENGTH-ADJUSTING DEVICE FOR CONTROL CABLE

Yoshiharu Kitamura, Aikawa-machi, Japan, assignor to NHK Spring Co. Ltd., Yokohama, and Uniflex, Inc., Ina, both of Japan

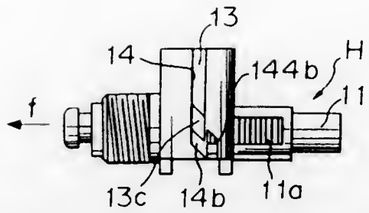
Division of Ser. No. 41,480, Apr. 2, 1993, Pat. No. 5,435,202. This application Apr. 13, 1995, Ser. No. 422,303

Claims priority, application Japan, Apr. 6, 1992, 29310; Jul. 24, 1994, 218405

Int. Cl.[6] F16C *1/10*

U.S. Cl. 74—502.4 **1 Claim**

1. In combination, a length-adjusting device for a control cable, comprising:



a stationary base member to which an outer cable or an inner cable of said control cable is fixedly secured, and into which an adjusting pipe, having formed and disposed thereon parallel latching teeth, is inserted and is movable axially thereof;

an adjusting piece, having parallel pairs of similarly pitched locking teeth for engagement to and release from said latching teeth, which is movably inserted in a direction rectangular to the axis of said adjusting pipe and into an aperture in said stationary base member;

a resilient spring installed between said base member and said adjusting piece, said resilient spring biasing said locking teeth of said adjusting piece so as to engage with said latching teeth provided on said adjusting pipe; and

said length-adjusting device comprising a pair of projections provided on the outer sides of said adjusting piece;

a pair of guide grooves guiding said projections of said adjusting piece, provided on each of the inner sides of said stationary base member;

each of said guide grooves comprising a straight groove guiding said adjusting piece up and down, and an inclined groove continuously shaped along said straight groove; and

each of said inclined grooves comprising an inclined face, a slant face opposing said inclined face, and a vertical face downwardly shaped from said slant face.

5,588,334

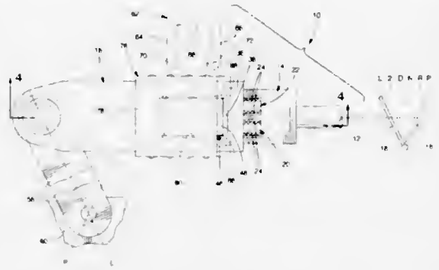
CABLE CORE ADJUSTER WITH LOCK MEMBERS

Jian G. Lu, Troy, and Ronald L. Beckmann, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1995, Ser. No. 429,961

Int. Cl.[6] F16C *1/10*

U.S. Cl. 74—502.6 **2 Claims**



1. A cable adjustment mechanism comprising:

a cable body member having a first toothed locking structure formed thereon;

a cable core member having a second toothed locking structure formed thereon;

a lock member for engaging both said first and second toothed locking structures to secure a positional relation between said cable body member and said cable core member; and

a cover member formed separately of said lock member and disposed on said cable core member for selectively overlapping said lock member to prevent disengagement of said lock member from said first and second toothed locking structures and including a top surface for covering said lock member and a bottom surface including two arm, each having tab means disposed thereon for selective engagement with shoulder means defined on said cable core member to secure said cover member in overlapping relationship with said lock member.

5,588,335

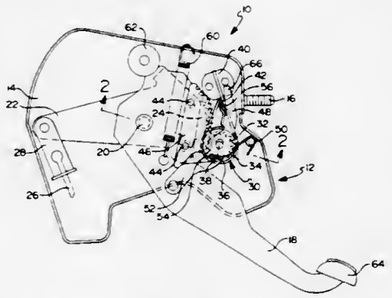
TORSION LOCK PARKING BRAKE ACTUATOR WITH PUSH DOWN RELEASE

Daniel L. Strait, 11856 Silver Creek Dr., Apt. 1, Birch Run, Mich. 48415

Filed Apr. 28, 1995, Ser. No. 430,859

Int. Cl.[6] G05G *5/06*

U.S. Cl. 74—512 **5 Claims**



1. A torsion lock parking brake actuator comprising:

a frame that is adapted to be mounted on a support member,

a transfer lever pivotally mounted on the frame for applying a parking brake responsive to rotation of the transfer lever,

an operator lever pivotally mounted on the frame for rotating the transfer lever,

a torsion lock operatively connected to the transfer lever for locking the transfer lever in a brake set position where the parking brakes are applied, and

a torsion lock release mechanism operatively connected to the operator lever that engages the torsion lock when the transfer lever is in the brake set position to release the transfer lever responsive to rotation of the operator lever, said torsion lock release mechanism including

a sector ratchet that is attached the operator lever, and

a lock pawl that is pivotally mounted on the frame that includes

a tooth that is shaped to engage the teeth of the sector ratchet, and

an arm that engages the torsion lock to release the transfer lever.

5,588,336

HANDLEBAR STEM COUPLING MODULE FOR A BICYCLE

Chen-chang Chou, No. 9, Chingchuan Rd., Taya Hsiang, Taichung Hsien, Taiwan

Filed Oct. 16, 1995, Ser. No. 543,304

Int. Cl.[6] B62K *21/18*

U.S. Cl. 74—551.1 **2 Claims**

1. A handlebar stem coupling module for a bicycle comprising a steerer tube, a handlebar stem having a compression connector formed on one distal end thereof and mounted around an outer wall of said steerer tube, a polygonal passage longitudinally defined

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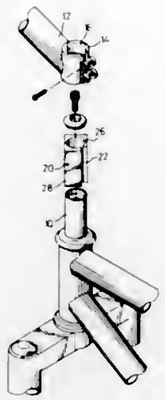


through an inner wall of said compression connector, an urging sleeve securely mounted between the outer wall of said steerer tube and the inner wall of said compression connector, a polygonal outer wall formed on said urging sleeve and received in said polygonal passage of said compression connector, a plurality of graduations formed on said polygonal outer wall of said urging sleeve, a circular hole vertically defined through an inner wall of said urging sleeve for receiving said steerer tube therein, and an elongated slit laterally and vertically defined in said urging sleeve and extending along a length thereof and communicating with said circular hole.

5,588,337

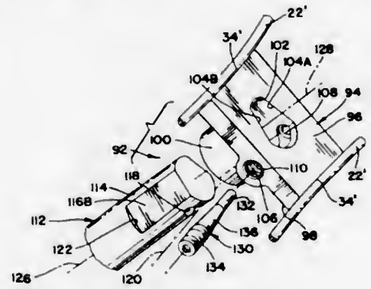
MOTOR VEHICLE STEERING COLUMN

Thomas J. Milton, Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 340,999, Nov. 17, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,162

Int. Cl.[6] B62D *1/10*

U.S. Cl. 74—552 **2 Claims**



1. A motor vehicle steering column including

a steering shaft,

a steering wheel having a hub at the center thereof,

a cylindrical passage in said hub interrupted by a first pair of flat sides parallel to a longitudinal centerline of said cylindrical passage converging in a V-shape from a wide side of said cylindrical passage to a narrow side of said cylindrical passage,

a cylindrical journal on said steering shaft interrupted by a second pair of flat sides parallel to a longitudinal centerline of said cylindrical journal converging in a V-shape corresponding to the V-shape of said first pair of flat sides of said cylindrical passage from a wide side of said cylindrical journal to a narrow side of said cylindrical journal,

said cylindrical journal being received in said cylindrical passage with said first pair of flat sides facing said second pair of flat sides, and

means on said steering shaft and on said hub operative to induce lateral thrust between said hub and said steering shaft so that said first pair of flat sides is wedged between said second pair of flat sides and to positively prevent dislodgment of said cylindrical journal from said cylindrical passage,

characterized in that said means to induce lateral thrust between said hub and said steering shaft and to positively prevent dislodgment of said cylindrical journal from said cylindrical passage comprises:

a lateral bore in said hub intersecting said cylindrical passage across said wide side thereof and including a first segment on a first side of said cylindrical passage and a second segment on an opposite second side of said cylindrical passage on a common centerline of said lateral bore with said first segment,

a control rod in said lateral bore rotatable about said common centerline having a frustoconical body and a first end on one side of said frustoconical body in said first segment of said lateral bore and a second end on the other side of said frustoconical body journaled in said second segment of said lateral bore,

an internal screw thread in said first segment of said lateral bore,

an external screw thread on said first end of said control rod engaging said internal screw thread and cooperating therewith to effect linear translation of said control rod in said lateral bore in the direction of said common centerline in response to rotation of said control rod, and

a lateral notch in said first cylindrical journal across said wide side thereof registering with said lateral bore in said hub having a surface at an angle to said common centerline substantially equal to the cone angle of said frustoconical body of said control rod so that said frustoconical body and said surface of said lateral notch cooperate to convert linear translation of said control rod in the direction of said common centerline into lateral thrust of said hub relative to said steering shaft.

5,588,338

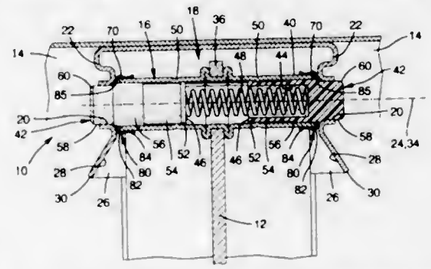
SNAP-IN PEDAL WITH END CAPS

James E. Carr, Waterford, and Mark A. Lindsey, Westland, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 86,418, Jul. 2, 1993, Pat. No. 5,398,569. This application Nov. 30, 1994, Ser. No. 347,566

Int. Cl.[6] G05G *1/14;* **F16C** *11/06*

U.S. Cl. 74—560 **14 Claims**



1. In a mounting for a control pedal on a motor vehicle for rotation about an axis, the combination comprising:

a mounting bracket fixed relative to the vehicle and having first and second apertures defining the axis of rotation;

the pedal having first and second bearings defining a pivot axis and a spring, wherein the first and second bearings are biased by the spring to axially outer positions and wherein the spring is compressible such that opposing forces on the bearings axially moves the bearings into axially compressed positions;

wherein the spring forces the bearings in the axially outer positions when the pedal is positioned so that the bearings are exterior of the bracket;

wherein the bracket forces the bearings in the axially compressed positions when the bearings are located within the bracket and not within the first and second apertures;

wherein the spring forces the bearings in the axially outer positions when the bearings are in the first and second apertures, whereby the pedal snaps into the bracket; and

a pair of pedal end caps disposed between the pedal and the bracket when the bearings are in the first and second apertures.

5,588,339

ADJUSTABLE STROKE DRIVE FOR A DISPLACEMENT PISTON PUMP

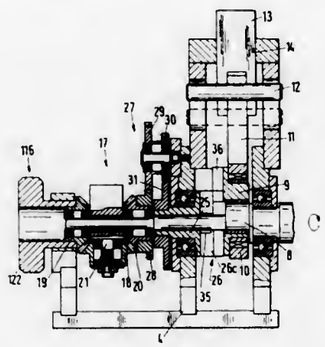
Viktor Dulger, Heidelberg, Germany, assignor to ProMinent Dosiertechnik GmbH, Heidelberg, Germany

Filed Aug. 4, 1994, Ser. No. 285,957

Claims priority, application Germany, Aug. 7, 1993, 43 26 621.5; Sep. 28, 1993, 43 32 947.0

Int. Cl.[6] F16H *21/20*

U.S. Cl. 74—836 **12 Claims**



12. A stroke drive for a displacement piston pump, having a drive shaft, a first driven eccentric, a push rod with a support therefor and a push element articulately connected to said push rod and being guided in a linear manner, a second eccentric supported on said first eccentric, the second eccentric being formed as a disc and being mounted on said first eccentric which has been formed as a crank journal, said disc carrying said push rod bearing at its circumference, the second eccentric being formed as a part of a cross-staff head coupling and means for connecting said push rod support to said second eccentric, an intermediate drive for coupling said eccentrics to each other and for conveying a synchronous rotation thereto, and an arrestable adjusting device for changing the relative position of the eccentricities of the eccentrics relative to each other, wherein the intermediate drive includes:

a) a differential having a first input connected to said first eccentric, a second input connected to said adjusting device, and an output leading to said second eccentric, and

b) a reduction drive between the output of the differential and said coupling and reducing the speed at a ratio of 2:1.

5,588,340

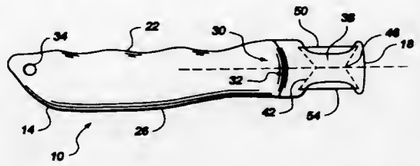
HAND HELD IMPLEMENT SHARPENING DEVICE

Dennis H. Hancock, Mt. Green, Utah, assignor to All Rite Products, Inc., Mt. Green, Utah

Filed Mar. 14, 1995, Ser. No. 404,169

Int. Cl.[6] B24D *13/06*

U.S. Cl. 76—82 **17 Claims**



1. An implement sharpening device comprising:

a body member having a handle end and an engagement end;

a plate having a composition and engagement surface configuration useful for sharpening a steel blade, said plate being positioned at said engagement end and partially enclosed within said body member such that the engagement surface is exposed;

said plate having at least one notch therein, said notch being at least partially disposed within said body member such that portions of said body member extend into the notch so as to hold said plate in a substantially rigid position with respect to said body member;

a curved plurality of ridges disposed along said handle end thereby providing a finger grip;

a curved portion disposed along said handle end opposite said ridges thereby contouring to the palm of the hand of a user;

a dished area disposed at the joining of said handle end and said engagement end thereby providing an area for placement of the thumb of a user; and

a raised ridge disposed along one side of said dished area so as to provide bracing for the thumb of a user.

5,588,341

FUSE EXTRACTION TOOL

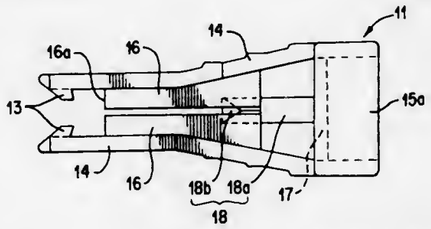
Eiji Higuchi, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Jun. 26, 1995, Ser. No. 494,826

Claims priority, application Japan, Jun. 30, 1994, 6-149096

Int. Cl.[6] B25B *27/14*

U.S. Cl. 81—3.8 **14 Claims**



1. A fuse extraction tool comprising an end portion having opposed resilient forks extending therefrom, said forks having free ends, and said free ends having opposed teeth for engagement with a blade type fuse, wherein said forks are divided from said end portion in the direction of said free ends so as to form two legs of each fork, the legs lying in a plane perpendicular to the plane of the forks, opposite legs of each fork being connected by respective link members which constitute said end portion, and the legs connected by respective link members being movable towards and away from each other, one of said link members having a projection to urge legs connected to the other link member apart such that

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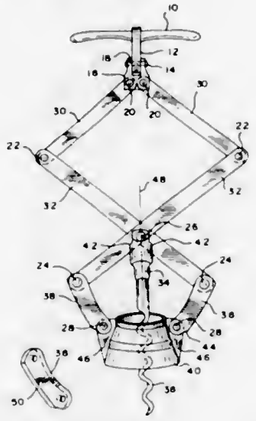
in use when the link members are urged together in a direction substantially perpendicular to the plane of said forks, the free ends of said forks are urged apart.

5,588,342

CORK PULLER FOR PULLING CORKS FROM A RANGE OF BOTTLE TOP SIZES

Dexter D. Ahlgren, and Valerie E. Ahlgren, both of P.O. Box 909, Boulder Creek, Calif. 95006

Filed May 24, 1995, Ser. No. 448,656
Int. Cl.[6] B67B *7/04*
U.S. Cl. 81—3.47 **17 Claims**



1. A cork pulling device comprising:

a bottle neck receiving seat having a central opening, the central opening defining a longitudinal axis of the device;

a first pair of links pivotally attached to the bottle neck receiving seat by pivotal connections;

a second pair of links having a curvalinear shape when viewed from along said longitudinal axis, the second pair of links pivotally attached to the first pair of links by pivotal connections;

a third pair of links pivotally attached to the second pair of links by pivotal connections;

a handle having a curvalinear shape attached to the third pair of links and mounted to pivot between a first position used in inserting the cork pulling device into a cork and a second position used in pulling the cork from a bottle, wherein in the first position, the curvalinear shape of the handle is aligned with the curvalinear shape of the second pair of links, and wherein in second position, the curvalinear shape of the handle is unaligned with the curvalinear shape of the second pair of links; and

a screw attached to the second pair of links at a central pivot and depending through the central opening of the bottle neck receiving seat.

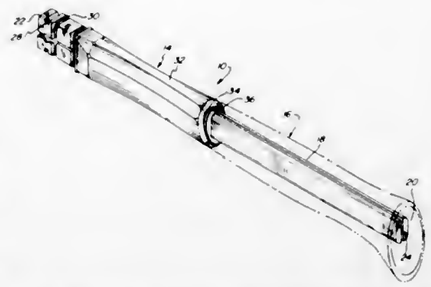
5,588,343

HANDLE WITH IMPROVED GRIP ASSEMBLY FOR HAMMERS AND THE LIKE AND METHOD OF MAKING SAME

Howell B. Rust, Manchester, and Kenneth W. Hreha, Tullahoma, both of Tenn., assignors to The Stanley Works, New Britain, Conn.

Filed Sep. 15, 1994, Ser. No. 306,835
Int. Cl.[6] B25G *1/01*
U.S. Cl. 81—489 **20 Claims**

1. A handle for hammers and the like comprising:



(a) an elongated core member having a tool engaging end and a grip end;

(b) a synthetic resin sleeve on and securely interlocked with said core member adjacent said tool engaging end, said sleeve having a peripheral collar extending about its end disposed towards said grip end; and

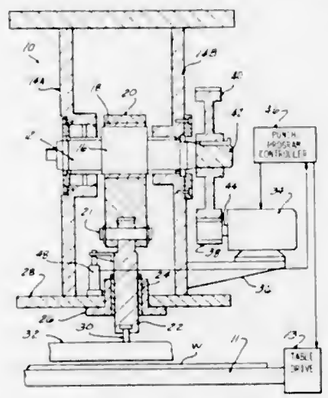
(c) a grip member of relatively resilient material extending about said core member from said grip end and having an end portion overlying and interlocked with said collar on said sleeve, said grip member being securely interlocked with said core member.

5,588,344

ELECTRIC SERVO MOTOR PUNCH PRESS RAM DRIVE

Victor L. Chun, Charlotte, N.C., assignor to Murata Machinery, Ltd., Kyoto, Japan

Filed Jun. 13, 1994, Ser. No. 261,052
Int. Cl.[6] B26D *5/14*
U.S. Cl. 83—13 **10 Claims**



8. A method of driving a ram of a punch press through a programmed punching operation comprising the steps of:

coupling a reversible electrical servo motor to a crankshaft having an eccentric journal, the journal receiving an upper end of a pitman arm which has a lower end coupled to said ram;

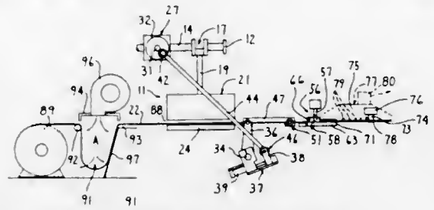
rotating the electrical servo motor under program control to cause the crankshaft to oscillate through a range of rotation corresponding to a ram punching stroke; wherein said crankshaft is oscillated through a range of movement through bottom dead center from a position partially rotated before bottom dead center to a position partially rotated past bottom dead center, corresponding to a punching stroke between a partially retracted hover height and a fully extended ram position.

5,588,345

FIN SHEET CONTROL APPARATUS FOR PRESS

Lawrence A. Franks, Sturgis, Mich.; Galen B. Harman, La Grange, Ind., and Herman Flint, Sturgis, Mich., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Nov. 22, 1993, Ser. No. 156,263
Int. Cl.[6] B26D *5/22;9/00;* **B65H** *35/06*
U.S. Cl. 83—95 **11 Claims**



7. A sheet metal working apparatus, comprising:

a sheet metal working press;

sheet metal supply means adapted to supply an elongated and flat strip of sheet metal stock to an inlet of said press and along a path of movement;

intermittent first drive means for effecting an intermittent movement of said strip of sheet metal stock relative to said press;

intermittent second drive means for effecting a metal working engagement of a tool means on said press with said strip of sheet metal stock during intervals of time between said intermittent movement of said strip of sheet metal stock to produce a continuous strip of finished sheet metal fin stock; and

wherein said sheet metal supply means includes a roll of sheet metal stock and support means for rotatably supporting said roll, and further includes, between said roll and said inlet, a means for forming and maintaining said strip of sheet metal stock into a generally upwardly opening, laterally extending, trough so that when said strip of sheet metal stock is moved into said inlet caused by said intermittent first drive means, said strip of sheet metal stock will be drawn from said trough rather than directly from said roll of sheet metal stock, said means for forming and maintaining said strip of sheet metal stock into said trough including wall means defining at least one upstanding wall surface oriented along a side of said trough adjacent said inlet and an air blowing means having an air outlet oriented above said trough and aiming air exiting said air outlet into said trough and at a sufficient volume to urge said strip of sheet metal stock into frictional sliding engagement with said upstanding wall surface so as to cause said strip of sheet metal stock to be kept under tension and free of wrinkling as said sheet metal stock is pulled into said inlet by said intermittent first drive means.

5,588,346

PNEUMATIC BOOSTER

Jean Pierre Gautier; Ulysse Verbo, both of Aulnay-Sous-Bois, and Miguel Perez Revilla, Argenteuil, all of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

PCT No. PCT/FR94/00536, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO94/29152, PCT Pub. Date Dec. 22, 1994
PCT Filed May 6, 1994, Ser. No. 244,165
Claims priority, application France, Jun. 14, 1993, 93 07121
Int. Cl.[6] F15B *9/10*
U.S. Cl. 91—369.002 **6 Claims**

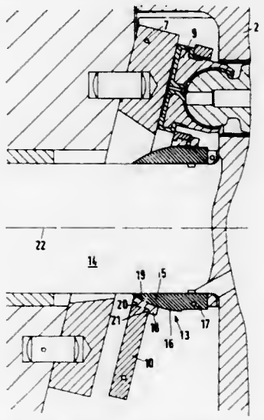
1. A pneumatic brake booster including a casing having a piston with a hub, said hub having a tubular part a portion of which extends backwards and passes in a sealed fashion through said casing, said hub supporting a skirt and including an annular groove for receiving an internal peripheral bead of a rolling seal, said rolling seal defining a front chamber in said casing which is permanently connected to a source of vacuum and a back chamber which is selectively connected to the front chamber and to the atmosphere in response to an input force applied by a front face of a plunger, on a reaction disk secured by a second face on a push rod, characterized in that said tubular part of the piston has a front end having a bead which penetrates into a peripheral groove formed on said hub, said tubular part being permanently connected to said hub by clipping.

5,588,347

HYDRAULIC AXIAL PISTON MACHINE WITH AN INCLINED PLATE

Hardy P. Jepsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

PCT No. PCT/DK94/00021, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO94/16224, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 12, 1994, Ser. No. 464,689
Claims priority, application Germany, Jan. 18, 1993, 43 01 121.7
Int. Cl.[6] F01B *3/00*
U.S. Cl. 92—12.2 **14 Claims**



1. A hydraulic axial piston machine having a inclined plate on which a slider shoe of at least one piston slides on relative movement between a cylinder body receiving the piston and the inclined plate, and a pressure plate articulated on the cylinder body and holding the slider shoe in engagement with the inclined plate, and in which between the pressure plate and cylinder body there is arranged a bearing element with a bearing surface of plastic material which slides with low friction on a counterpart made of metal lying against the bearing surface.

5,588,348

BRAKE ACTUATOR WITH CENTERING DOME IN SERVICE CHAMBER

Ronald S. Plantan, and Henry T. Dangson, both of Charlotte, N.C., assignors to Indian Head Industries, Inc., Charlotte, N.C.

Filed Aug. 7, 1995, Ser. No. 512,022
Int. Cl.[6] F01B *19/00;31/00*
U.S. Cl. 92—63 **18 Claims**

1. A combination for use in a service chamber of a spring brake actuator comprising:

a diaphragm having a central permanently deformed portion;

a push rod having a piston, said piston having a permanently deformed portion corresponding to the shape of the permanently deformed portion of said diaphragm; and

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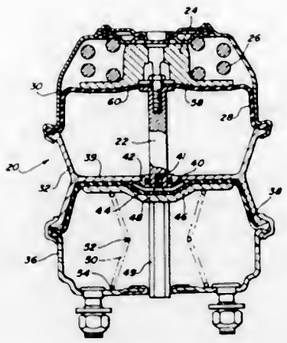


the cross-sectional shape of said permanently deformed portion of said piston and said diaphragm being generally frusto-conical, to correspond to the shape of a dome extending from a central housing into the service chamber.

5,588,349

SERVO WITH ENHANCED SAFETY

Jean-Pierre Gautier; Ulysse Verbo, both of Aulnay-Sous-Bois, and Maurice Gebauer, Sevran, all of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

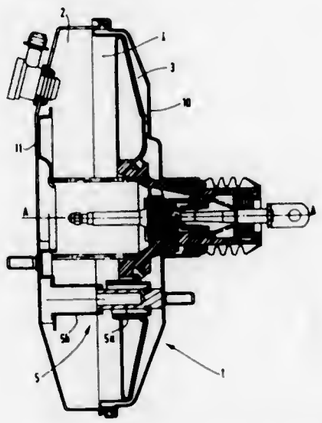
PCT No. PCT/FR95/00029, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO95/21083, PCT Pub. Date Aug. 10, 1995

PCT Filed Jan. 10, 1995, Ser. No. 379,464

Claims priority, application France, Feb. 4, 1994, 94 01250

Int. Cl.[6] F01B *11/02;* **F15B** *9/10*

U.S. Cl. 92—169.3 **5 Claims**



1. A pneumatic servo for brake boosting intended for motor vehicles having a rigid casing defined by first and second shells, said first and second shell being divided into at least two chambers by means of a flexible membrane, said first and second shells being joined together by at least first and second tie rods to define a sealed casing, said first and second tie rods being reacting to any force which tends to move said first and second shell apart, said first and second tie rods each being characterized by a cable which joins said first shell to said second shell together in an axial direction to maintain said sealed casing while being compressible to allow an external impact force applied to said first shell to dissipated without being transferred into said second shell.

5,588,350

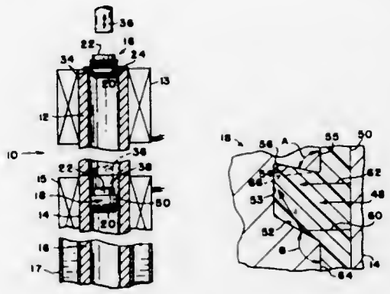
MANUFACTURE OF BANDED PISTONS

Richard A. Bowell, Sr., Huber Heights, Ohio, assignor to Freudenberg-NOK General Partnership, Plymouth, Mich.

Continuation-in-part of Ser. No. 236,019, May 13, 1994, which is a continuation-in-part of Ser. No. 86,054, Jul. 6, 1993, Pat. No. 5,345,860. This application Feb. 10, 1995, Ser. No. 431,151

Int. Cl.[6] F16J *9/00;* **F16K** *41/00*

U.S. Cl. 92—192 **14 Claims**



1. Apparatus for banding a relatively thin, flat fluoropolymer washer having a central hole onto an outer cylindrical surface of a piston having a head end, a tail end, a circumferential washer anchoring groove closely adjacent said head end and a plurality of circumferential material-receiving grooves intermediate said anchoring groove and said tail end, and wherein said washer is mounted in said anchoring groove with the washer assuming a circumferentially-beveled shape having the largest diameter of the bevel located toward said piston tail end, said apparatus comprising:

a heat-conducting banding tube having a cylindrical internal diameter greater than the piston diameter and essentially of the diameter of a hydraulic or pneumatic cylinder with which said piston is to be ultimately cooperatively assembled;

means for heating said banding tube to a predetermined hot-forming temperature for a predetermined time period to cause heated fluoropolymer to flow into said material grooves while a piston and washer assembly are located in said heated tube;

a cooling tube in coaxial alignment with said heated tube for cooling and setting the hot-formed fluoropolymer material after the washer has conformed to the cylindrical shape of the piston;

an inwardly beveled heated entrance end at that end of said heated tube opposite said cooling tube, said beveled heated end corresponding closely to the circumferentially-beveled shape of said washer in said anchoring groove;

means for applying a preheating temperature to said beveled entrance end whereby the beveled washer placed in contact with the surface of said beveled entrance end may be raised to a temperature greater than ambient temperature but less than the temperature at which said material becomes flowable; and

means for sequentially urging said piston, after the washer anchored to the piston has had its beveled surface in contact with said beveled entrance end for a predetermined time period sufficient to prebeat the washer, from said beveled entrance end into and through said banding and cooling tubes for time periods sufficient to hot-form and set said washer into a cylindrical band about said piston.

7. The method of banding a piston having a plurality of material-receiving grooves with a relatively thin, flat fluoropolymer washer having a central hole by initially attaching the washer by-means of said central hole to grip in an anchoring groove adjacent a head end of said piston and thereafter drawing the piston and washer unit through a hot-forming sizing tube under pressure and heat to convert said washer into sleeve form encompassing the piston periphery, comprising the steps of:

providing said tube with a beveled entrance end, a first hot-forming section and a second hot-forming section through which said unit sequentially passes;

heating said first section and beveled entrance end to a temperature substantially greater than the temperature at which the material of said fluoropolymer washer becomes flowable;

heating said second section to a temperature at which said material becomes flowable sufficiently to be reshaped but below that at which said material begins to gel;

resting said unit on the beveled entrance end for a few seconds with said washer being in surface contact with said bevel and said piston head end facing toward said hot-forming sections in order to initially preheat said washer to a temperature substantially above ambient but below flow-inducing temperature;

rapidly urging said preheated unit inwardly of said tube through said first section and thereby simultaneously converting said washer into sleeve shape while elongating said sleeve away from the piston head end;

moving said unit into said second hot-forming section for a time period and under heat and pressure sufficient to cause said material to flow into the material-receiving piston grooves and tightly conform to the piston periphery; and,

cooling said unit while retaining said sleeve at the diameter at which it was hot-formed in said second section until said fluoropolymer material solidifies and retains the shape to which it was hot-formed.

5,588,351

HEAD FOR TWO PIECE ARTICULATED PISTON

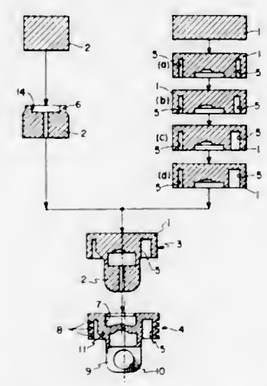
Andre Lippai; Jorge K. Tanigami, both of Sao Paulo, and Paulo T. Dellanoce, Sao Caetano do Sul, all of Brazil, assignors to Metal Leve S/A Industria E Comercio, Sao Paulo, Brazil

Continuation of Ser. No. 34,091, Mar. 22, 1993, abandoned, which is a division of Ser. No. 767,047, Sep. 27, 1991, Pat. No. 5,245,752. This application Oct. 28, 1994, Ser. No. 331,176

Claims priority, application Brazil, Sep. 28, 1990, 9004990

Int. Cl.[6] F16J *1/04;* **F02F** *7/00*

U.S. Cl. 92—208 **13 Claims**



1. A head as one piece of a two piece oil cooled piston to which a separate skirt is to be attached as the second piece to form the two piece piston for internal combustion engines comprising:

a substantially cylindrical first monolithic metallic blank having on its lower face a machined circumferential groove for receiving oil as a cooling chamber, said circumferential groove being of variable width with an outer wall which is axially symmetric and an inner wall which is axially asymmetric with the blank longitudinal axis, said first blank having on its upper face a recessed combustion bowl axially offset of the first blank longitudinal axis and concentric with the inner wall of said circumferential groove,

and an originally separate substantially cylindrical second blank of the same material as said first blank having an annular rib on one face joined to the part of the lower face of the first blank interior of said circumferential groove inner wall to complete the head and leaving access to said circumferential groove.

5,588,352

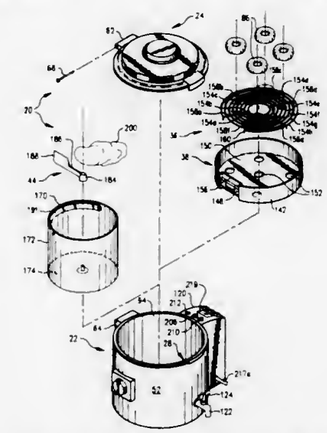
APPLIANCE FOR MAKING YEAST DOUGHS AND COOKING BAGELS

Robert G. Harrison, Seattle, Wash., assignor to PMI International Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 372,518, Jan. 13, 1995, Pat. No. 5,526,734. This application May 30, 1995, Ser. No. 452,509

Int. Cl.[6] A47J *37/12;* **A23B** *4/03*

U.S. Cl. 99—339 **18 Claims**



1. A bagel dough making and bagel cooking appliance which comprises:

a casing;

a boiler zone in said casing; a first heating means for boiling water in said boiling zone;

an oven zone in the casing; a second heating means in said oven zone;

a bagel support means which is installable in and removable from said casing;

a user-actuatable means for shifting said bagel support means to said boiler zone to boil bagels supported on said bagel support means and for shifting said bagel support means to the oven zone to bake the boiled bagels; and

dough making means installable in and removable from said casing.

5,588,353

AUTOMATIC BREAD-MAKING APPARATUS

Dov Z. Glucksman, Wenham, and Karl H. Weidemann, Hull, both of Mass., assignors to Appliance Development Corp., Danvers, Mass.

Filed Jul. 18, 1995, Ser. No. 503,557

Int. Cl.[6] A47J *27/00*

U.S. Cl. 99—348 **18 Claims**

1. An automatic bread making apparatus for baking dough, said apparatus comprising:

a housing having an interior surface and defining a top opening;

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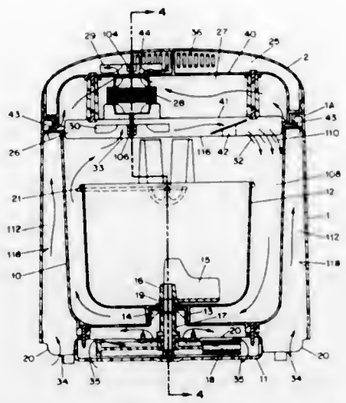


a top cover for covering the top opening of said housing, said top cover having an interior partition, said interior partition defining a first compartment adjacent one side of said partition for circulating cool air and a second compartment adjacent a second side of said partition for circulating hot air;

a baking chamber having interior and exterior surfaces, said baking chamber positioned within said housing to form an air space between the interior surface of said housing and the exterior surface of said baking chamber, said air space coupled to said first compartment;

a baking pan made of a heat-conductive material, said baking pan positioned within said baking chamber to define an air space between the interior surface of said baking chamber and said baking pan, said air space coupled to said second compartment;

a first impeller coupled to said second compartment and configured to supply and circulate heated air; and

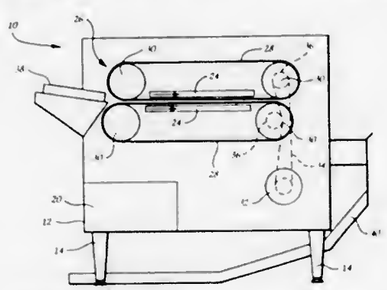
a second impeller coupled to said first compartment and configured to supply and circulate cool air.

5,588,354

APPARATUS FOR CONVEYORIZED GRIDDLE-LIKE COOKING OF FOOD PRODUCTS

Robert M. Stuck, Lake Wylie, S.C., and James Rapier, III, Charlotte, N.C., assignors to Marshall Air Systems, Inc., Charlotte, N.C.

Filed Sep. 21, 1995, Ser. No. 531,709
Int. Cl.[6] A23L *1/00;* **A47J** *37/00;37/04*
U.S. Cl. 99—386 **12 Claims**



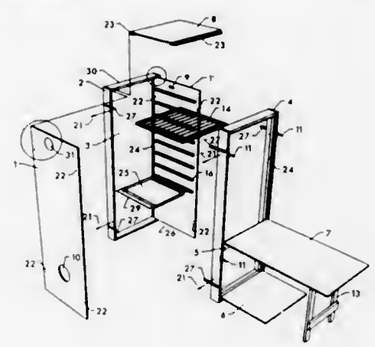
1. Apparatus for conveyorized heating of a food product simultaneously on two opposed sides, the apparatus comprising a pair of heating elements arranged in opposed spaced facing relation for emitting thermal energy toward one another, two endless food transport conveyors each having a substantially continuous imperforate food contacting surface, and means for driving the conveyors to travel between the heating elements along respective food-conveying runs in a common transport direction in sufficiently closely spaced, generally parallel relation to transport the food product to be heated between the conveyors and between the cooking elements by contact of the respective food contacting surfaces of the conveyors with opposite sides of the food product, the drive means comprising a pair of rollers supporting each conveyor and a drive motor connected in synchronous driving relation to one roller of each pair.

5,588,355

KNOCKDOWN COMPACTABLE FOOD SMOKER AND METHOD OF USE THEREOF

Julian E. Mead, and James B. Mead, both of P.O. Box 871908, Wasilla, Ak. 99687-1908

Filed Apr. 17, 1995, Ser. No. 423,279
Int. Cl.[6] A23B *4/044;* **F24C** *5/20*
U.S. Cl. 99—449 **8 Claims**



1. A portable, compactable smokehouse comprising:

a) a front frame unit;

b) a rear frame unit;

c) a pair of oppositely disposed side walls, said oppositely disposed sidewalls being removably attached to the front frame unit and the rear frame unit, thereby forming a box-like structure;

d) a top, removably attached to said box-like structure;

e) a means for supporting food, removably installed within said box-like structure;

f) a means for providing smoke into said box-like structure;

g) a first access door, hingably installed on said box-like structure to permit access to said means for providing smoke into said box-like structure;

h) a second access door, hingably installed on said box like structure to permit access to aid means for supporting food; and

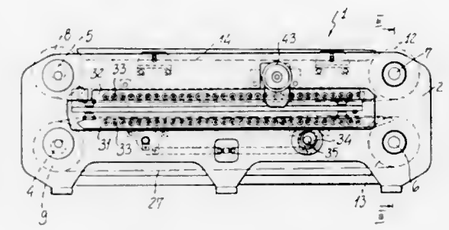
i) a means for supporting the second access door such that the second access door assumes a horizontal, flat plane surface when opened.

5,588,356

CHAIN MOLD FOR PREPARING SOLID FOOD PRODUCTS, OR FILLED FOOD PRODUCTS, OF DIFFERENT THREE DIMENSIONAL SHAPES

Roberto Rizzi, and Mario Rizzi, both of Via Trieste 62, Martinengo (Bergamo), Italy

Filed Jan. 16, 1996, Ser. No. 584,940
Claims priority, application Italy, Jun. 26, 1995, MI95A1365
Int. Cl.[6] A21C *3/06;9/00;11/00;* **A23P** *1/00*
U.S. Cl. 99—450.6 **10 Claims**



1. A chain mold for making solid food products, in particular filled food products, having different three dimensional shapes, said chain mold comprising:

a supporting contruction including two shoulders respectively supporting an upper shaft and an upper axle and a bottom shaft and a bottom axle having horizontal and parallel rotary axes;

gear wheels mounted on each of said shafts and axles respectively meshing with an upper chain and a bottom chain;

said upper and bottom chains each having chain links mutually facing along a vertical intermediate plane and sequentially defining dihedral shaped articles;

the dihedral shaped articles of the bottom chain having a cutting edge for cutting a food product bead;

each link of said upper chain slidably supporting along said dihedral articles, a pair of controllably movable half-molds which are movable toward and away from a corresponding pair of half-molds supported by an opposite link so as to form a mold for a food product piece from said food product bead supplied along said intermediate plane, said mold having a set length to provide a food product with a set proper shape; and

operating systems provided for controlling said half-molds so as to drive said half-molds and align them to provide a precise cutting of said food product bead.

5,588,357

SHOCK WAVE STERILIZER

Hisao Tomikawa, Takatsuki; Hideo Matsuo, and Kazuhito Fujiwara, both of Kumamoto, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

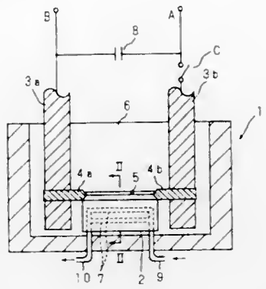
Filed Oct. 25, 1994, Ser. No. 328,830
Claims priority, application Japan, Oct. 25, 1993, 5-266403
Int. Cl.[6] A23L *3/32*
U.S. Cl. 99—451 **10 Claims**

1. A shock wave sterilizer, comprising:

an elastic container for containing a fluid medium to be sterilized;

a shock wave source disposed to face said elastic container, said shock wave source comprising an electrical conductor connected to a source of electrical current of a value sufficient to heat said electrical conductor to a point at which said electrical conductor vaporizes and produces a shock wave; and

a pressure transfer medium interposed between said shock wave source and said elastic container convey the force of the shock wave to said elastic container and the medium therein.

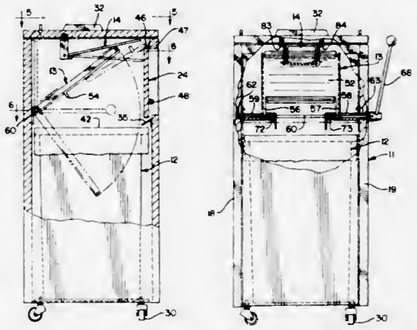


5,588,358

TRASH HANDLING DEVICE

Frank H. Klepacki, 724 Pinecrest Ct., Hinsdale, Ill. 60521, and David G. Klepacki, 1660 Stoney Point Ct., Colorado Springs, Colo. 80919

Filed Nov. 7, 1995, Ser. No. 554,843
Int. Cl.[6] B30B *15/14;1/04*
U.S. Cl. 100—53 **7 Claims**



1. A trash handling device comprising a housing within which a trash container is received, said container having an open upper end, said housing including an access door swingable inwardly to allow trash to be delivered to said container, a compactor including a compacting plate pivotally mounted within the housing and swingable into said container to compact trash therein, lever means exterior of the housing connected to said compacting plate for selectively driving the plate into said container and compacting trash therein, means normally biasing said compacting plate to a rest position above said container and permitting said access door to freely swing inward for depositing trash in said container, and safety lock means preventing said access door from swinging inwardly when said compacting plate is moved from the rest position to prevent a person from being injured during a compacting operation.

5,588,359

METHOD FOR FORMING A SCREEN FOR SCREEN PRINTING A PATTERN OF SMALL CLOSELY SPACED FEATURES ONTO A SUBSTRATE

Jim Hofmann, and Darryl Stansbury, both of Boise, Id., assignors to Micron Display Technology, Inc., Boise, Id.

Filed Jun. 9, 1995, Ser. No. 488,704
Int. Cl.[6] B41N *1/24*
U.S. Cl. 101—128.21 **22 Claims**

1. A method for forming a screen for screen printing a substrate, said method comprising:

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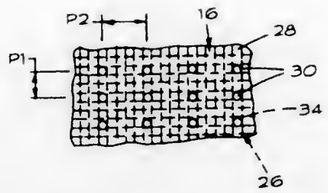


providing a mesh including screen wires interwoven to form screen openings of a predetermined size and frequency;

depositing an emulsion on the mesh;

providing a mask having open areas spaced to form a desired pattern;

aligning the open areas of the mask with the screen openings by viewing the open areas and screen openings through a viewing device and adjusting a location of the mask or screen; and

patterning the emulsion by directing a laser light through the mask to ablate the emulsion and form a pattern of openings therethrough in alignment with the screen openings.

5,588,360

TEMPERATURE-CONTROL DEVICE FOR ROTATING BODIES IN PRINTING MECHANISMS

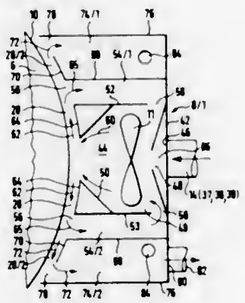
Hans-Joachim Kurz, Grossaltingen, Germany, assignor to Baldwin-Gegenheimer GmbH, Germany

Filed Mar. 7, 1994, Ser. No. 206,794

Claims priority, application Germany, Mar. 11, 1993, 43 07 732.3

Int. Cl.[6] B41F *13/22*

U.S. Cl. 101—212 **14 Claims**



1. A temperature control device for rotating bodies in a printing mechanism, which bodies include at least one of printing cylinders, inking rolls and rubber blanket cylinders, the temperature control device comprising:

a blowing device having a generally box shape, having a length along the axis of the associated rotating body and extending circumferentially partly around the rotating body, and being shaped for blowing a stream of cold air through the blowing device and onto the outer surface of the rotating body substantially over the entire length of the body;

means for generating cold air, including an air inlet for air to be chilled by the generating means and an air outlet for cold air;

a blower for blowing cold air in the stream through the blowing device, the blower being connected with the air outlet from the generating means for receiving cold air therefrom;

a first air recirculation circuit in the blowing device including a first cold air return channel having an inlet region near the rotating body and placed so as to draw cold air which has been blown onto and then deflected by the rotating body away from the rotating body, and the first return channel being shaped to direct the cold air back into the stream of cold air being blown through the blowing device;

means for producing a vacuum region in the blowing device along the stream of cold air blowing through the blowing device toward the rotating body, and the vacuum region communicating with the first return channel for drawing recirculated cold air back into the stream of cold air.

5,588,361

DEVICE AND METHOD FOR INSERTING OR REMOVING OPERATING PARTS INTO OR FROM A PRINTING MACHINE

Einar K. Riis, Skodsborg, Denmark, assignor to Werner Kammann Maschinenfabrik GmbH, Bunde, Germany

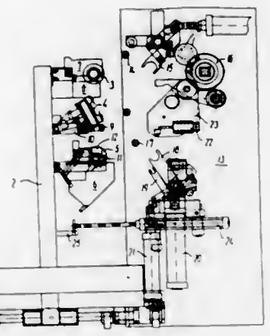
PCT No. PCT/DK94/00051, § 371 Date Jul. 28, 1995, § 102(e) Date Jul. 28, 1995, PCT Pub. No. WO94/18007, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 2, 1994, Ser. No. 500,902

Claims priority, application Denmark, Feb. 3, 1993, 126/93

Int. Cl.[6] B41F *13/20;13/40;13/44*

U.S. Cl. 101—216 **4 Claims**



1. A device for selectively inserting and removing operating parts (3,4,5,6) into and from a printing machine (13) having a removable front panel, said device comprising:

a) a carriage (1) adapted to be placed in a position facing said removable front panel in the printing machine (13);

b) a frame (2) mounted on said carriage (1) for movement transversely relative thereto into and out of the printing machine (13) after said front panel has been removed, said frame having first releasable securing means (7,8,10,11,12) for releasably securing at least one of said operating parts (3,4,5,6) to be selectively inserted and removed, said first releasable securing means being released by cooperation with releasing means (14,17) situated in the printing machine (13);

c) second releasable securing means situated in the printing machine (13) for releasably securing at least one of said operating parts (3,4,5,6) to be selectively inserted and removed;

d) individual power-driven transfer means (15,18,19,20,21,22) adapted after releasing of said second releasable securing means to transfer at least one of said operating parts (3,4,5,6) from the first releasable securing means (7,8,10,11,12) on the frame (2) to the second releasable securing means in the printing machine (13) after releasing thereof, and vice versa; and

e) means situated in the printing machine (13) adapted to bring the first and second releasable securing means into their securing positions when removing the frame (2) from the printing machine (13).

5,588,362

CYLINDER THROW-ON AND THROW-OFF MECHANISM FOR PRINTING PRESS

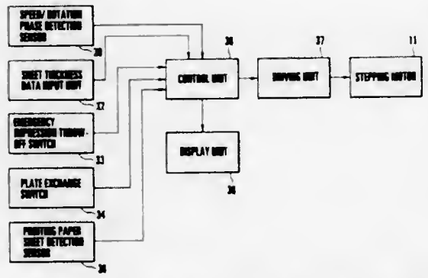
Hiroyuki Sugiyama; Norio Hirose, both of Ibaragi; Teruyoshi Hamabuchi, Kanagawa, and Hikoji Muto, Tokyo, all of Japan, assignors to Komori Corporation, Japan

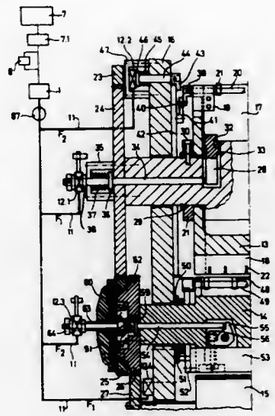
Filed May 2, 1995, Ser. No. 433,224

Claims priority, application Japan, May 6, 1994, 6-116079

Int. Cl.[6] B41F *13/24*

U.S. Cl. 101—218 **9 Claims**





1. A cylinder throw-on and throw-off mechanism for a printing press having a plate cylinder and a printing cylinder, which are disposed with outer surfaces being separated from each other, and a blanket cylinder disposed therebetween, comprising:

driving means, having a motor serving as a driving source, for moving said blanket cylinder between an impression-on position where said blanket cylinder is pressed against said plate cylinder and simultaneously pressed against said printing cylinder through a paper sheet and an impression throw-off position where said blanket cylinder is separated from said plate cylinder and said printing cylinder in accordance with a direction of rotation and a number of revolutions of said motor;

control means for setting an operation pattern of said motor, which is defined by a total number of revolutions of said motor and a relationship between a mechanical rotation phase and said total number of revolutions of said motor, and driving and controlling said motor in accordance with said set operation pattern, wherein said control means determines an operation timing and said operation pattern such that a gap angle of said blanket cylinder is included within ranges of a gap angle of said plate cylinder and a gap angle of said printing cylinder;

sheet thickness data generation means for generating sheet thickness data of a printing paper sheet, and wherein said control means sets the operation pattern of said motor on the basis of the sheet thickness data; and

phase detection means for detecting a rotation phase of said printing press, and wherein said control means calculates an operation timing of an impression-on/impression throw-off operation of said blanket cylinder in accordance with a phase signal output from said phase detection means and drives and control said motor in accordance with said operation pattern.

5,588,363

METHOD AND DEVICE FOR PERFORMING OPERATING STEPS IN AN ADJUSTMENT OF A PRINTING PRESS

Willi Becker, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Jan. 23, 1995, Ser. No. 376,430

Claims priority, application Germany, Jan. 21, 1994, 44 01 684.0

Int. Cl.[6] B41F *5/02;21/10;1/20*

U.S. Cl. 101—230 **9 Claims**

1. A printing machine having a plurality of adjusting components comprising:

a) a pressure medium source for providing a first pressure medium;

b) a first pressure system supplied with the first pressure medium;

c) a second pressure system filled with a second pressure medium in operative engagement with the adjusting components, and means for pressurizing the second pressure medium in the second pressure system in response to pressure applied to said first pressure system by said pressure medium source; and means for moving each of said plurality of adjusting components in response to a fluid under pressure from said pressure medium source for acting against a respective counter force;

d) said second pressure system in operative engagement with the adjusting components for moving each of the adjusting components against a respective counter force;

e) means for causing the first pressure system to apply pressure at different pressure stages to second pressure system;

f) said adjusting components are divided into groups, and wherein the counter forces are different from group to group;

g) means for balancing the counter force against the adjusting components of a respective group against the corresponding pressure stage;

h) means for performing a first work step under pressure of a first pressure stage and for performing a further work step under pressure of a further pressure stage, and

i) means for providing a pressure to the further pressure stage greater than the pressure of a preceding pressure stage.

5,588,364

PRINT UNIT DAMAGE PREVENTION ASSEMBLY

Claus A. Bolza-Schünemann, Würzburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed May 18, 1995, Ser. No. 444,363

Claims priority, application Germany, May 20, 1994, 44 17 661.9

Int. Cl.[6] B41F *13/24*

U.S. Cl. 101—247 **8 Claims**

1. A print unit damage prevention assembly usable to prevent damage to print units in a web-fed rotary printing press, said assembly comprising:

a plurality of rubber blanket cylinders pivotably supported in side frames of a printing press;

a counter-pressure cylinder supported in said side frames, said rubber blanket cylinders being selectably in contact with each other and said counter-pressure cylinder;

controllable adjustment means usable to shift said blanket cylinders in said side frames;

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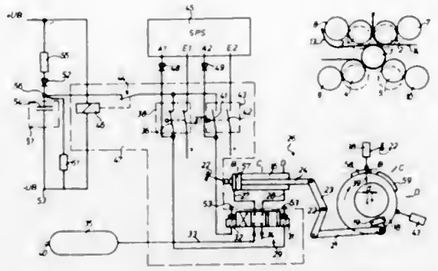


an energy reservoir which can receive and store electrical energy during normal operation of said printing press in which said blanket cylinders are located; and

a control means interposed between said energy reservoir and said adjustment means for said blanket cylinders, said control means being operable upon a failure of an electrical supply to said printing press to provide power to said adjustment means from said energy reservoir to move at least one of said blanket cylinders to a pressure release position out of contact with its associated blanket cylinders and counter-pressure cylinder.

5,588,365

APPARATUS FOR METERING LIQUID MEDIA IN OFFSET PRINTING MACHINES

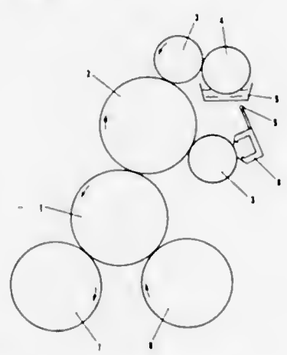
Manfred Herold, Hainburg; Georg Hartung, Seligenstadt; Hans-Willy Schutz, Freigericht, and Ulrich Jung, Limburg, all of Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Dec. 23, 1994, Ser. No. 371,268

Claims priority, application Germany, Dec. 23, 1993, 43 44 084.3

Int. Cl.[6] B41F *31/04;31/06;3/30*

U.S. Cl. 101—350 **8 Claims**



1. An offset printing machine comprising

an impression cylinder,

a form cylinder,

a first liquid media supply subassembly located at a first location adjacent the form cylinder, said subassembly including

a metering roller,

a dipping roller, said metering roller being in contact with said dipping roller, said metering roller and said dipping roller having different surface hardnesses, and

a reservoir containing a first liquid media of determined viscosity, said dipping roller being rotatable within the reservoir such that the first liquid media is transferred to the surface of the dipping roller,

said first subassembly being selectively movable between an inoperative position in which said metering roller is in disengaged relation to the form cylinder and an operative position in which said metering roller is in contacting engagement with said form cylinder for supplying said first liquid media to said form cylinder,

a second liquid media supply subassembly located at a second location adjacent said form cylinder different from said first location, said second subassembly comprising

a screen applicator roller,

a chamber doctor comprising at least one doctor blade supported along the circumference of the screen applicator roller, and

a supply of a second liquid media of higher viscosity than said first liquid media, said second supply supplying liquid to the surface of the screen applicator roller, the chamber doctor metering the application of the second liquid media to the screen applicator roller,

said second subassembly being selectively movable between an inoperative position in which said screen applicator roller is out of contact with said form cylinder and an operative position in which said screen applicator roller contacts said form cylinder at a location different from the location of contact of the metering roller of said first subassembly, said second subassembly supplying the second liquid media to the form cylinder when said second subassembly is in the operative position and said first subassembly is in the inoperative position.

5,588,366

METHOD OF MONITORING THE WEAR ON PRINTING FORMS IN A PRINTING MACHINE

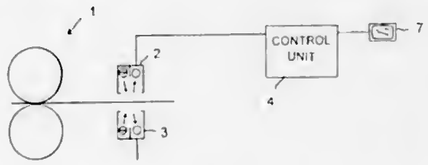
Gerhard Löffler, Walldorf, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Apr. 20, 1995, Ser. No. 425,825

Claims priority, application Germany, Apr. 20, 1994, 44 13 736.2

Int. Cl.[6] B41F *33/02*

U.S. Cl. 101—484 **2 Claims**



1. A method of monitoring wear on printing forms in a printing machine, which method comprises:

defining a first measurement location on a print image, the first measurement location having a defined first tonal value above a given upper tonal value;

defining a second measurement location on the print image, the second measurement location having a defined second tonal value below a given lower tonal value;

scanning, with an image recording device, a printed image on a printed surface of a print product at the first and second measurement locations;

producing image signals of the first and second measurement locations with the image recording device and supplying the image signals to a control unit; and

deducing, from the image signals, wear on the printing forms and outputting signals representing the wear with the control unit.

5,588,367

RAILWAY VEHICLE SUSPENSIONS

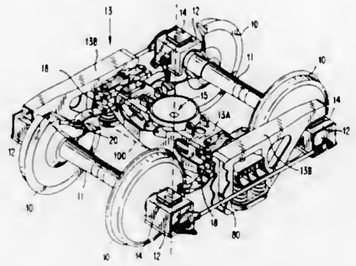
Herbert Scheffel, 83 A Van Wouw Street, Groenkloof, Pretoria, Transvaal, South Africa

Filed Mar. 9, 1994, Ser. No. 207,730

Claims priority, application South Africa, Mar. 9, 1993, 93/1668

Int. Cl.[6] B61D *5/38;5/26*

U.S. Cl. 105—168 **13 Claims**



1. A railway vehicle which includes a frame suspended on at least two wheelsets coupled to one another and spaced from one another along a longitudinal axis of said frame, each of said coupled wheelsets having a live axle which has ends mounted in respective axle boxes, and couplings which are attached to the frame and which couple the axleboxes of one of the coupled wheelsets to the axleboxes of the other of the coupled wheelsets in such a manner as to constrain relative movements between the coupled wheelsets in a lateral plane, each coupling including:

interconnected crank levers which operate to uncouple lateral movements of the frame from the movements of the coupled wheelsets, and

links which connect the crank levers to the respective axleboxes of the coupled wheelsets and which are inclined relative to said longitudinal axis, the links which connect the crank levers to the axleboxes at the ends of each of the coupled wheelsets lying on axes which intersect substantially at said longitudinal axis.

5,588,368

SECONDARY SUSPENSION FOR RAIL VEHICLES

Wolfgang-Dieter Richter, Winkelhaid; Lutz Uebel, Heroldsberg, and Engelbert Weeger, Nürnberg, all of Germany, assignors to MAN GHH Schienenverkehrstechnik GmbH, Nurnberg, Germany

PCT No. PCT/DE93/00671, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO94/03340, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 30, 1993, Ser. No. 211,367

Int. Cl.[6] B61F *5/00*

U.S. Cl. 105—199.1 **4 Claims**

1. A secondary suspension for rail vehicles, comprising:

a supplementary spring;

means for fixing said supplementary spring means between a car body and a bogey frame of said rail vehicle;

means for fixing said supplementary spring means between a car body and a bogey frame of said rail vehicle;

means for compressing said supplementary spring when said rail vehicle is stopped, thereby lowering said car body;

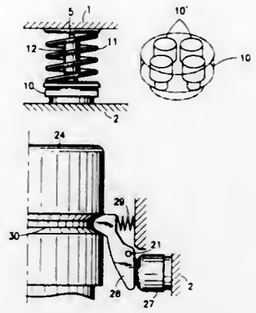
means for permitting extension of said supplementary spring when said rail vehicle is in motion;

said means for permitting extension includes at least one lifting element;

said at least one lifting element includes means for locking said lifting element at an upper end position thereof;

said means for locking includes at least one latch;

said at least one latch engages a slot in said lifting element.



5,588,369

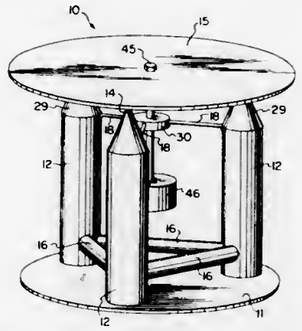
PASSIVE STABILIZATION PLATFORM

Emad Rizkalla, and David Newbury, both of St. John's, Canada, assignors to Zedd Technologies Inc., St. John's, Canada

Filed May 12, 1994, Ser. No. 241,858

Int. Cl.[6] A47F *5/12*

U.S. Cl. 108—2 **4 Claims**



1. A passive stabilizing platform which comprises:

(a) a base;

(b) a platform;

(c) at least three vertically-upright hollow cylindrical legs, each of said legs having a lower end and an upper end, each of said legs being secured at the lower end thereof to said base, and being disposed equi-angularly around said base, wherein in use, each of said hollow cylindrical legs contains a cylindrical column of water therein;

(d) a plurality of hollow cylindrical tubes, two tubes being connected to each of said hollow cylindrical legs near the lower end of each of said hollow cylindrical legs thereby interconnecting said hollow cylindrical legs to each other to allow free unimpeded movement of water between said interconnected hollow cylindrical legs so that an upper surface of water in each of said hollow cylindrical legs automatically moves to an equilibrium level;

(e) a spherical float member disposed in each of said hollow cylindrical legs, said spherical float member being movable only vertically upwardly or vertically downwardly within the hollow cylindrical leg within which said spherical float member is disposed, said movement being dependent solely, and in conjunction with, said upper surface of water in the hollow cylindrical leg within which said float member is disposed;

(f) a plurality of support arms, each of said support arms having an upper end and a lower end, each of said support arms being fixed at said lower end to an associated said float member and extending upwardly from said associated float member and

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being fixed at said upper end to said platform, to cause rotation of said platform about a vertical axis upon vertical movement of said support arms;

(g) a joint secured between said hollow cylindrical legs and said platform to permit said complete rotation of said platform about a vertical axis;

(h) a depending vertical shaft rigidly secured to said platform; and

(i) a counterweight hanging on said depending vertical shaft below said joint;

whereby said passive stabilizing platform compensates for the effects of rolls, pitches, yaws, vibrations and accelerations simultaneously, to keep said platform level in the "X" and "Y" axes at all times.

5,588,370

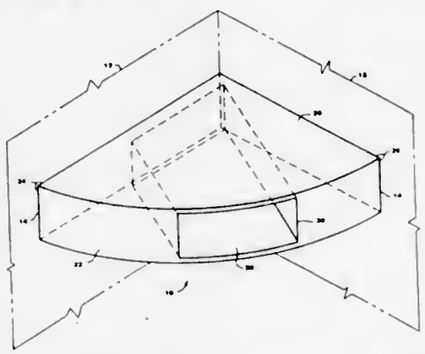
RIGID SHELF STRUCTURE

Jonathan T. Longley, 15 Westwood Rd., Lexington, Mass. 02173

Filed Apr. 3, 1995, Ser. No. 415,732

Int. Cl.[6] A47B *23/00*

U.S. Cl. 108—42 **17 Claims**



1. A shelf structure, suitable for mounting in a corner, comprising:

an upper surface;

a first abutment surface depending from said upper surface;

a second abutment surface depending from said upper surface, said second abutment surface further conjoined to said first abutment surface;

a front face depending from said upper surface, said front face further extending between said abutment surfaces; and

a torsion member unitary with said upper surface, said torsion member extending between said front face and at least one of said abutment surfaces.

5,588,371

SKID FOR HEAVY PAYLOADS

Robert Looker, Carpenteria, Calif., assignor to Satco, Inc., El Segundo, Calif.

Filed Apr. 21, 1994, Ser. No. 230,630

Int. Cl.[6] B65D *19/38*

U.S. Cl. 108—51.1 **33 Claims**

1. A skid for transporting a payload, the skid comprising:

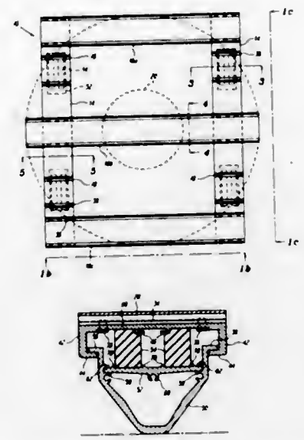
a skid platform;

a plurality of feet on the platform, each foot including:

an upper section attached to the platform;

a lower section secured to the upper section;

a shock absorber extending between the upper section and the lower section;



an interior plate in the lower section supporting the shock absorber; and

means for substantially restricting horizontal movement of the upper section relative to the lower section.

5,588,372

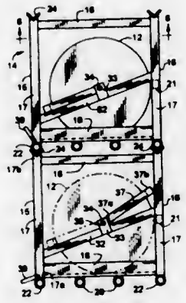
STACKABLE DISPENSING APPARATUS FOR WIRE REELS

Patrick J. Kelly, Hartlebury, England, assignor to National-Standard Company

Filed May 9, 1994, Ser. No. 239,278

Int. Cl.[6] B65D *19/44*

U.S. Cl. 108—55.1 **26 Claims**



1. Stackable pallet skid members for storing and dispensing reels of wire, with each of the pallet skid members being substantially rectangular in shape and having a front portion, a rear portion and two side portions, including in combination:

four corner post members extending vertically upwardly in substantially parallel alignment, with each of said corner post members having upper and lower ends each terminating in a single plane;

end support members secured and connected to respective pairs of said corner posts members adjacent to said upper and lower ends to define the side portions of the pallet skid members;

at least one rear support member secured add connected to the pair of said corner post members intermediate the end thereof to define the rear portion of the pallet skid members;

end retaining means supports extending between respective pairs of said corner post members intermediate the upper and lower ends thereof, said end retaining means supports having bracket members mounted thereto;

a plurality of rail members horizontally extending from the lower front edge portion to the rear edge portion of the skid member, with each pair of said rail members structurally arranged to receive and support the reel sides of a reel of wire when the reel of wire is vertically oriented in a side-by-side relationship on the pallet skid member;

upper support members secured and connected to the upper ends of each pair of said corner post members and extending the length of the front and rear portions of the skid members;

lower support members secured and connected to the lower ends of each pair of said corner post members and extending the length of the front and rear portions of the skid members, with said upper support members and said lower support members structurally arranged to provide a linear extending nesting and stacking of the pallet skid members when one pallet skid member is positioned on top of another pallet skid member; and

retaining means hingedly mounted to said bracket members on said end retaining means supports of the pallet skid member, with said retaining means adapted to pivotally move from a closed position wherein the vertically oriented reels of wire are retained on the pallet skid member to an open position wherein the vertically oriented reels of wire may be removed from the pallet skid member by rolling the reels along said rail members.

5,588,373

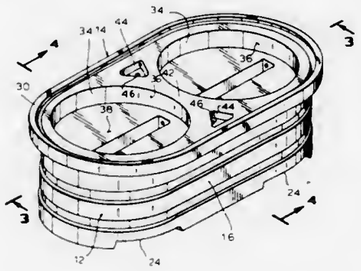
LIQUID CONTAINMENT PALLET

Stephen A. Bacskay, Central Islip, N.Y., assignor to Chemtainer Industries, Inc., West Babylon, N.Y.

Filed Feb. 14, 1995, Ser. No. 388,522

Int. Cl.[6] B65D *19/44*

U.S. Cl. 108—55.3 **9 Claims**



1. A liquid containment pallet for supporting at least one container for storing liquids, comprising:

a confined basin defined by integral sidewalls and a bottom wall, said bottom wall having integral means for receiving a pallet lifting means for lifting and moving said pallet; and

a platform for detachably supporting at least one container, said platform having receiving means for supporting said at least one container in an elevated position relative to said bottom wall of said confined basin and preventing said container from sliding appreciably relative to said platform when supported on said platform, said platform including means for supporting said platform with respect to said basin and draining means for communicating spillage from said container to said basin, said platform and said basin collectively forming a liquid containment volume for accumulating said spillage.

5,588,374

TRANSPORT AND STORAGE SYSTEM AND APPLICABLE SUPPORT AND MOUNTING EQUIPMENT

Dieter Urbach, Grünwald, Germany, assignor to Oeco-Team Unfernehmens-und Umweltberatung GmbH, Grunwald, Germany

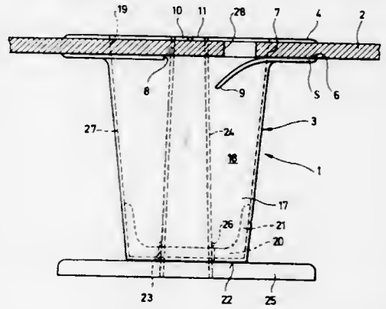
PCT No. PCT/EP92/00176, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO93/08088, PCT Pub. Date Apr. 29, 1993

PCT Filed Jan. 28, 1992, Ser. No. 78,278

Claims priority, application Germany, Oct. 22, 1991, 41 34 849.4; Nov. 12, 1991, 41 37 166.6

Int. Cl.[6] B65D *19/12*

U.S. Cl. 108—56.3 **59 Claims**



1. In a transport and storage system (1) having a goods mounting arrangement (2) which includes a support apparatus that has at least one support footing (3) having an upper end and a lower end, the upper end having a connection device in the form of two outwardly extending shoulders (4, 5) which, when attached to the mounting arrangement (2) form an upper (4) and a lower (5) outwardly extending shoulder, the lower shoulder (5) having a feed opening (8) and a downwardly extending tongue (9), the improvement comprising:

wherein the upper shoulder (4) has, in an area above the feed opening (8), at least one flexible lip (10, 11) that can be flexed from an upper plane which includes the upper shoulder (4), wherein the shoulders (4, 5) are made as annular shaped edge strips running parallel to each other with each lid (10, 11) being formed by a slot (12) which runs radially outwardly from the support footing (3), and by another slot (13, 14) which runs along an interior load side (16) of the upper shoulder (4).

5,588,375

MOUNTING TRACK

Michael J. Cotterill, Lot 5, Tugalong Road, Canyonleigh N.S.W. 2577, Australia

PCT No. PCT/AU93/00231, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO93/22950, PCT Pub. Date Nov. 25, 1993

PCT Filed May 19, 1993, Ser. No. 338,494

Claims priority, application Australia, May 19, 1992, PL2522; Aug. 7, 1992, PL4023

Int. Cl.[6] A47B *11/00*

U.S. Cl. 108—102 **16 Claims**

1. A workstation including:

two generally horizontal support members;

a linkage mechanism for maintaining a predetermined vertical displacement between the members;

the mechanism being fixed at one end to one of the members and at the other end including at least one longitudinally extending support formation; and

at least one mounting track for connecting the other support member and the support formation for relative longitudinal

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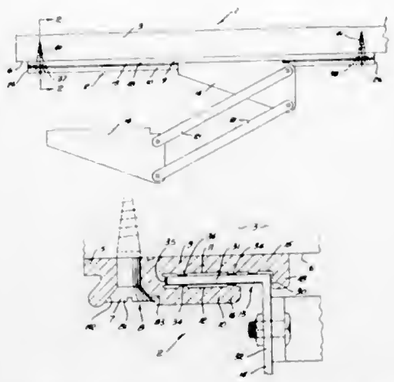


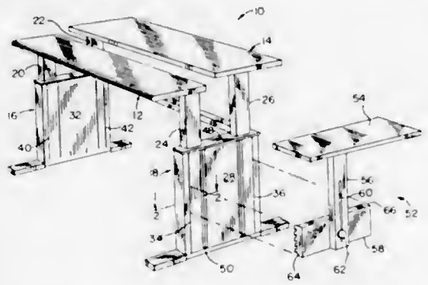
movement, the track including a longitudinally extending body for abutting the said other of the support members and first and second transverse arms extending from the body and having respective opposed substantially parallel first and second engagement surfaces which, in combination with the body, define an open ended channel for retaining the support formation, the free end of the first arm both extending beyond the free end of the second arm and including a peripherally depending lip for partly closing the channel to restrain transverse movement of the support formation, for longitudinal slideable engagement therewith.

5,588,376

SYSTEM FOR MOUNTING ONE OR MORE ITEMS TO THE LEG STRUCTURE OF A WORKTABLE

Lon D. Seidl, and David R. Funk, both of Green Bay, Wis., assignors to Krueger International, Green Bay, Wis.

Filed Feb. 24, 1994, Ser. No. 201,465
Int. Cl.[6] A47B *9/00*
U.S. Cl. 108—106 **2 Claims**



1. In a worktable including a work surface supported above a pair of spaced legs, each leg including a first inner surface facing toward the other leg and a second outer surface facing away from the other leg, a system for mounting an item to the worktable, comprising:

a pair of spaced vertical slot patterns provided on at least one of the inner and outer surfaces of each leg;

a pair of bracket members mounted to the item mounted to the worktable, the bracket members being spaced apart a distance substantially equal to the spacing of the slot patterns, each bracket member including structure engaged with one of the slot patterns for removably mounting the item to the worktable leg;

wherein the item comprises an overhead storage unit including an upper storage area and a pair of sides depending therefrom,

wherein each side is interconnected with the pair of bracket members for mounting to one of the legs;

wherein each side of the overhead storage unit is interconnected with the pair of bracket members by means of pocket structure to which the bracket members are connected and within which the lower end of each side of the overhead storage unit is received; and

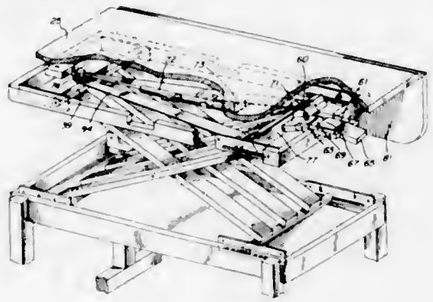
a pair of rollers mounted adjacent the work surface and extending outwardly one from each side of the work surface above one of the legs, and wherein each roller is engaged with one of the overhead storage unit sides to stabilize the overhead storage unit during adjustment of the vertical position of the work surface.

5,588,377

CONVERTIBLE TABLE CONFIGURABLE BETWEEN EXPANDED AND COMPRESSED POSITIONS

Hal Fahmian, Riverside, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed Apr. 25, 1995, Ser. No. 428,030
Int. Cl.[6] A47B *9/00*
U.S. Cl. 108—145 **19 Claims**



1. A convertible table, comprising:

(a) four legs supporting the convertible table above a supporting surface;

(b) a table bottom unit, comprising:

(1) a bottom planar surface parallel to the supporting surface, the bottom planar surface having a rectangular parameter; and

(2) four bottom sidewalls surrounding the rectangular parameter, each of the bottom sidewalls extending above and perpendicular to the bottom planar surface, the four bottom sidewalls forming four corners, the table bottom unit being connected to the four legs near the four corners;

(c) four bottom hinge brackets connected to the table bottom unit near the four corners;

(d) a table top unit comprising:

(1) a top planar surface parallel to the supporting surface; and

(2) four top sidewalls surrounding approximately the same rectangular parameter as the four bottom sidewalls, the four top sidewalls forming four corners, each of the top sidewalls extending below and perpendicular to the top planar surface;

(e) four top hinge brackets connected to the table top unit near the four corners formed by the four top sidewalls; and

(f) a table hinge positioned between the table bottom unit and the table top unit, comprising:

(1) an upper-front elongated member having two upper-front dowels at opposing ends, the two upper-front dowels fitting into a corresponding two of the four top hinge brackets;

(2) an upper-rear elongated member having two upper-rear dowels at opposing ends, the two upper-rear dowels fitting into a corresponding two of the four top hinge brackets;

(3) a lower-front elongated member having two lower-front dowels at opposing ends, the two lower-front dowels fitting into a corresponding two of the four bottom hinge brackets;

(4) a lower-rear elongated member having two lower-rear dowels at opposing ends, the two lower-rear dowels fitting into a corresponding two of the four bottom hinge brackets;

(5) a first set of parallel fingers connected between the upper-front elongated member and the lower-rear elongated member, the upper-front elongated member and the lower-rear elongated member being parallel to one another and perpendicular to the first set of parallel fingers;

(6) a second set of parallel fingers connected between the lower-front elongated member and the upper-rear elongated member, the lower-front elongated member and the upper-rear elongated member being parallel to one another and perpendicular to the second set of parallel fingers; and

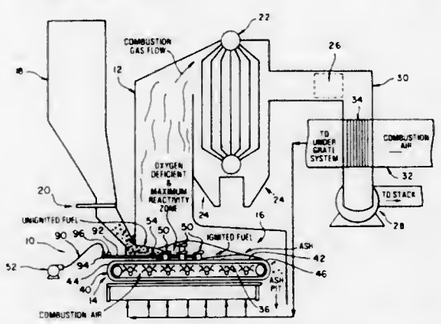
(7) a pin running through a center area of each of the fingers of the first and second sets of parallel fingers, the fingers rotating about the pin to bring the upper-front and lower-front elongated members into contact with one another and, at the same time, to bring the upper-rear and lower-rear elongated members into contact with one another to thereby bring the table hinge into a compressed configuration.

5,588,378

COMBUSTION ENHANCEMENT SYSTEM WITH IN-BED FOILS

Rick A. Mancini, Endicott, N.Y., assignor to New York State Electric & Gas Corporation, Binghampton, N.Y.

Filed Apr. 18, 1995, Ser. No. 423,088
Int. Cl.[6] F23K *3/00*
U.S. Cl. 110—101 A **38 Claims**



1. A stoker combustion enhancing system for a furnace, comprising:

a traveling grate for supporting a bed of fuel, said grate having an upper movable grate surface extending between a first end of said grate for receiving fuel to be burned and a second end of said grate for discharging spent fuel;

a first piping system for supplying combustion air beneath said upper grate surface of said grate;

a combustion enhancing member with a fluid receiving cavity positioned above said upper grate surface, said combustion enhancing member having a fuel engaging exterior surface with at least one passageway in fluid communication with said cavity for ejecting the fluid from said cavity into the fuel moving along said grate; and

a second piping system, independent from said first piping system, providing a source of pressurized fluid in fluid communication with said cavity of said combustion enhancing member for injecting a non-aqueous combustion enhancing agent into an area of the bed of fuel,

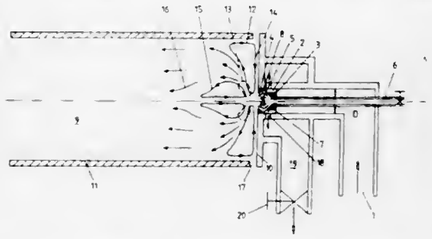
said combustion enhancing member being located in at least one oxygen deficient zone or maximum reactivity zone of ignited fuel on the bed of fuel.

5,588,379

MIXING DEVICE AND METHOD FOR GASEOUS LIQUID OF PULVERISED SUBSTANCES

Gustaaf J. Witteveen, Stationsstraat 41, 6584 AS Molenhoek, Netherlands

Continuation of Ser. No. 117,209, Sep. 14, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 423,354
Claims priority, application Netherlands, Mar. 20, 1991, 9100490
Int. Cl.[6] F23C *7/00;* **F23D** *11/10;* **B01F** *5/00;* **B05B** *7/10*
U.S. Cl. 110—262 **13 Claims**



1. A burner which mixes a combustion air flow with a fuel comprising:

a vortex chamber which is axially symmetric about a longitudinal axis, said vortex chamber including

an upstream side at one longitudinal end and a downstream side at the other longitudinal end defining an axial flow direction from the upstream side to the downstream side,

a central opening at the downstream side,

a tapering portion which tapers from a maximum radial inside diameter provided between the upstream and downstream side to a radial inside diameter at the central opening which is 70–90% of the maximum radial diameter,

a feed means for feeding combustion air into said vortex chamber to create a rotational movement of the combustion air about the longitudinal axis, said feed means including a plurality of openings through which the combustion air is fed to said vortex chamber, said openings being located at a periphery of said vortex chamber immediately upstream from the tapering portion,

a fuel inlet located at or upstream of said openings such that mixing of the rotating combustion air fed through the openings with fuel from the fuel inlet in said vortex chamber creates a vortex flow pattern of a fuel/air mixture about the longitudinal axis in said vortex chamber; and

a flame room fluidly connected with the central opening at the downstream side of said vortex chamber, said flame room including an inside diameter directly adjacent the central opening of said vortex chamber which is at least 2.5 times greater than the minimum radial inside diameter of the central opening whereby the conditions in the flame room are such that the vortex flow pattern of the fuel/air mixture breaks down upon entry of the fuel/air mixture into said flame room and combustion of the fuel/air mixture takes place in a substantially toroidal zone in the flame room.

5,588,380

DIFFUSER FOR COAL NOZZLE BURNER

Jeffrey A. LaRose, Stow, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 23, 1995, Ser. No. 448,206
Int. Cl.[6] F23D *1/00*
U.S. Cl. 110—263 **9 Claims**

1. A diffuser for a coal burner having a coal nozzle with an axis and an inner surface, the diffuser comprising:

a reducing area cone having tapering upstream and downstream ends, for positioning in a coal nozzle at the coal nozzle axis;

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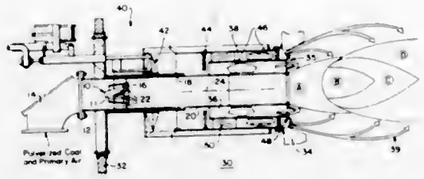


a frusto-conical shroud having a small diameter upstream end and a large diameter downstream end, positioned around the reducing area cone; and

a plurality of support legs fixed rigidly to the reducing area cone and extending radially outwardly through the shroud for fastening to the coal nozzle, each of the support legs being inclined at an acute angle to the axis of the coal nozzle for evenly spreading pulverized coal supplied through the coal nozzle and past the diffuser.

5,588,381

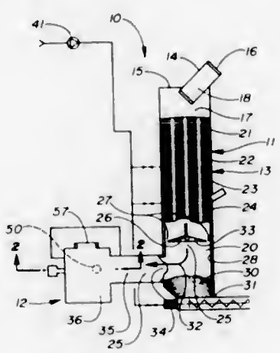
METHOD AND SYSTEM FOR BURNING WASTE MATERIALS

Markus Jennebach, Dachau, Germany, and Joao A. Birkhan, Viamao-Rs, Brazil, assignors to Leslie Technologies, Inc., Tallahassee, Fla., and Gruntec Ltda., Brazil

Filed Mar. 7, 1995, Ser. No. 399,847

Int. Cl.[6] F23J *11/00;15/00*

U.S. Cl. 110—345 **36 Claims**



20. A method for the two-stage combustion of a flammable gas generated during the treatment of waste materials, comprising the steps of: providing a pair of combustion chambers including a first substantially-horizontal chamber and a second substantially-vertical chamber disposed at a right angle to each other and communicating therebetween, the first chamber having an inlet portion for receiving the flammable gas in a horizontal direction thereof, injection of primary air into the first chamber, thereby forming a mixture of air and the flammable gas and thereby igniting the mixture for partial oxidation thereof, discharging the partially-oxidized mixture of air and the flammable gas tangentially into the second chamber, through a converging distal portion thereof, injection of secondary air tangentially into the second chamber, thereby substantially completely oxidizing the partially-oxidized mixture of air and the flammable gas, and discharging of the waste gas resulting from the two-stage combustion of the flammable gas through an outlet portion thereof.

5,588,382

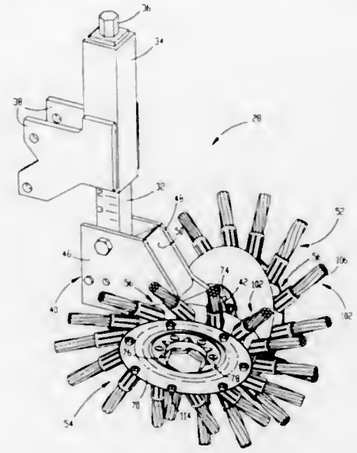
ZONE TILLER ATTACHMENT FOR PLANTERS

Gary L. Embree, and Robert A. Williams, both of Garden City, Kans., assignors to Acra Products, LLC, Garden City, Kans.

Filed May 27, 1993, Ser. No. 68,233

Int. Cl.[6] A01C *5/04*

U.S. Cl. 111—139 **22 Claims**



1. A zone tiller attachment for a farm implement for use in tilling a strip of loosened soil and simultaneously deflecting trash out of the tilled strip, said attachment comprising:

a support adapted for mounting on said implement; and

a pair of generally upright, downwardly and forwardly converging spoked wheels rotatably mounted on said support,

each of said wheels comprising a generally dish-shaped body having a slightly concave front side, a slightly convex back side, and an outermost, circumferential periphery,

said body including a central, generally circular trash-deflecting portion and a marginal spoked tillage portion encircling said trash-deflecting portion,

said trash-deflecting portion extending approximately one-half the radial distance from said center axis to the periphery of the body and the spoked portion extending the balance of the radial distance from said axis to the periphery of the body,

said trash-deflecting portion having an imperforate front face on the front side of the body for engaging and deflecting trash out of the strip when the wheel is in use on the implement and the wheel is rolling along the strip at an oblique angle to the strip,

said spoked portion including a peripheral series of circumferentially spaced, elongated, straight spokes projecting beyond the trash-deflecting portion,

said support including structure for positioning the wheels in side-by-side relationship for ground-driven rotation about respective, generally transverse axes as the tiller is moved forward with the spokes of the wheels in penetrating engagement with the ground,

the wheels being so positioned that the spokes move through arcuate paths of travel during rotation of the wheels and overlap into crossed relationship with one another along the bottom of the tiller and the lower front extremity thereof,

each of said spokes being raked back with respect to the direction of rotation of the wheels such that the spokes approach the center of their wheel obliquely with an inner end of each spoke leading an outer, trailing end thereof with respect to said direction of rotation,

said crossed relationship of the spokes extending from the lower front extremity of the tiller to an area adjacent the low point on the arcuate paths of travel of the spokes so that the crossed spokes are disposed for churning and cultivating the soil as

they move rearwardly through the soil, leaving a band-like zone of tilled soil in their wake.

5,588,383

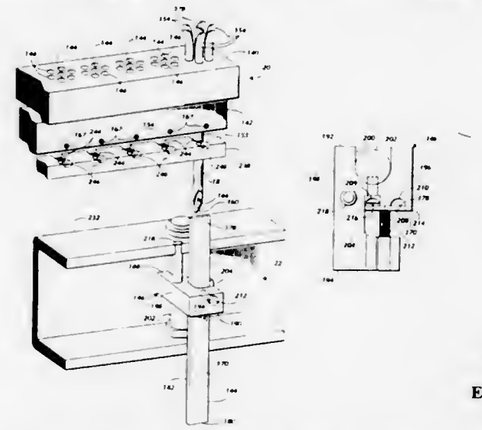
APPARATUS AND METHOD FOR PRODUCING PATTERNED TUFTED GOODS

David L. Davis, Indianola; Michael J. Black, Seattle; Richard A. Dolf, Seattle; Sean E. Gorman, Seattle; John M. Havard, Seattle, and Milton R. Sigelmann, Seattle, all of Wash., assignors to Tapistron International, Inc., Ringgold, Ga.

Filed Mar. 2, 1995, Ser. No. 397,742

Int. Cl.[6] D05C *15/24*

U.S. Cl. 112—80.16 **3 Claims**



1. Knife assembly for mounting to a frame and cutting yarn implanted into a backing by a hollow needle comprising:

a flat, elongate blade having longitudinal edges and a cutting edge extending between the longitudinal edges for shearing engagement with the needle;

a blade holder block having a passage for receiving the blade and a protrusion within the passage, the protrusion having a flat face; and

a screw extending through the block into the passage for selectively engaging the flat blade and holding the blade flush against the flat face, and alternatively, releasing the blade, the longitudinal edges of the blade extending beyond the flat face when the blade is engaged by the screw so that the blade can flex and conform to the needle when the blade engages the needle.

5,588,384

METHOD AND APPARATUS OF FOLDING OPPOSITE ENDS OF A PIECE OF TAPE

Nobuji Miyachi, and Kouji Miyachi, both of Kyoto, Japan, assignors to HAMS Corporation, Kyoto, Japan

Filed Aug. 15, 1995, Ser. No. 518,397

Claims priority, application Japan, Aug. 19, 1994, 6-230142

Int. Cl.[6] D05B *35/06*

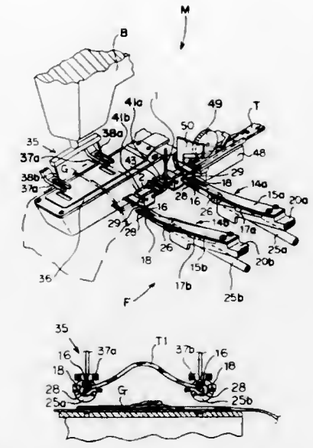
U.S. Cl. 112—475.06 **7 Claims**

1. A method of folding opposite ends of a piece of tape which is to be sewn as a belt loop on a garment, said method comprising the steps of:

(a) placing the piece of tape on a tape receiving member;

(b) pressing opposite ends of the piece of tape downwardly;

(c) holding the opposite ends of the piece of tape using two bifurcated tape folding shafts with at least one flat spring pressed against each of the bifurcated tape folding shafts; and



(d) rotating the bifurcated tape folding shafts in opposite directions to fold the opposite ends of the piece of tape with each of the opposite ends sandwiched between the flat spring and associated one of the bifurcated tape folding shafts.

5,588,385

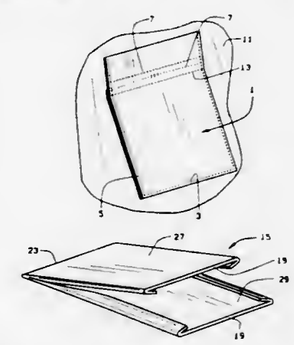
METHOD FOR MANUFACTURING IMPROVED BACK POCKET BLANK FOR PANTS

Edward A. Sand, St. Louis, Mo., assignor to Western Textile Products Company, St. Louis, Mo.

Filed Dec. 22, 1994, Ser. No. 362,218

Int. Cl.[6] A41D *27/20*

U.S. Cl. 112—475.09 **15 Claims**



1. The method of forming a back pocket blank for attachment to pants within a back pocket opening, comprising the steps of:

forming an elongated generally rectangular shaped back pocket blank having an opposed pair of longitudinal side edge portions and an opposed pair of shorter end edge portions extending generally transverse to the longitudinal side edge portions;

longitudinally folding a predetermined area of each of the longitudinal side edge portions back upon itself to provide a longitudinal side edge fold on each side of the back pocket blank;

creasing each longitudinal side edge fold to provide a flattened longitudinal side edge folded over section on each side of the back pocket blank;

transversely folding a predetermined area of the entire back pocket blank back upon itself along a transverse fold to

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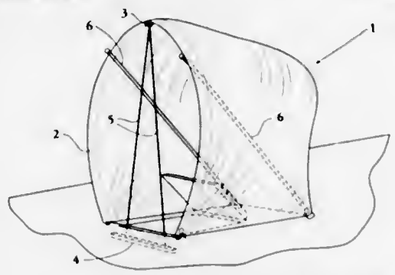
provide a transversely folded over area and a non-folded area of the back pocket blank, said transverse folding leaving the shorter end edge portion of the transversely folded over area spaced from the shorter end edge portion of the non-folded area while positioning the flattened longitudinal side edge folded over sections of the transversely folded over and non-folded areas in superimposed relationship to one another;

creasing the transverse fold to maintain the transversely folded over area in superimposed proximity to the non-folded over area of back pocket blank; and

subsequently sewing the thus formed back pocket blank with a back pocket opening of pants.

5,588,386
PORTABLE COLLAPSIBLE VENTILATOR
John A. Schilt, 2800 Robin La., Muskogee, Okla. 74403
Filed Feb. 13, 1996, Ser. No. 600,550
Int. Cl.[6] B63J *2/00*

U.S. Cl. 114—211 **5 Claims**



1. A portable ventilating device adapted to deflect a stream of air into an opening of an enclosed space such as a boat hull, comprising:

a resilient frame joined at the apex, which is bendable into a semi-circular shape to form the ventilator opening;

an adjustable length of line tied to the opposite ends of said resilient frame and stretched between said ends forming the bottom of said ventilator opening;

two lengthwise tubular supporting members to provide support for said ventilator, the top of each of said tubular member being attached to said resilient frame away from said joint at the apex and extending from the front of said ventilator rearward to the bottom of each of said tubular member;

a securing rod designed to be of a size larger than the diameter or longer side of said opening of a boat hull or compartment, with a length of line, from said bar to a mounting point fixedly attached at the apex of said resilient frame said securing rod inserted inside said opening of a boat hull or compartment;

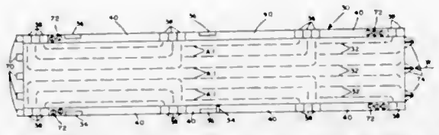
a cloth or fabric cover affixed to said resilient frame in the shape of a bonnet extending from said resilient frame outwardly and rearward and enclosing the above described structure; and

said portable ventilating device thus securely affixed to said opening of a boat hull or compartment by means of the tension of said resilient frame and said supporting rod and said lines.

5,588,387
FLOATING PLATFORM
Wentworth J. Tellington, P.O. Box 68291, Tucson, Ariz. 85737
Continuation-in-part of Ser. No. 154,119, Nov. 18, 1993, Pat. No. 5,398,635. This application Mar. 14, 1995, Ser. No. 404,049
Int. Cl.[6] B63B *35/44*

U.S. Cl. 114—261 **20 Claims**

1. A floating platform comprising:



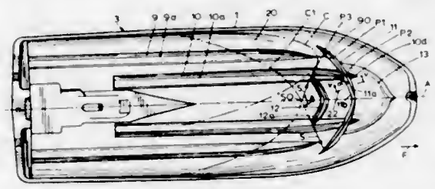
a plurality of independently buoyant modules releasably and flexibly connected to one another to form a single structure, wherein each module comprises at least one walking-beam pontoon system, propulsion means and means for fastening said module to said structure, said walking-beam pontoon system comprising:

a substantially rigid beam having two ends and a midsection pivotally mounted on a fulcrum in the module; and

at least one pontoon mounted substantially at each end of said beam.

5,588,388
HULL SHAPE OF SMALL WATERCRAFT
Haruyoshi Maruyama, Kakogawa; Shin Ogata, Himeji, and Yoshiaori Tsumiyama, Miki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan
Filed Jun. 7, 1995, Ser. No. 483,313
Claims priority, application Japan, Oct. 3, 1994, 6-264503
Int. Cl.[6] B63B *1/00*

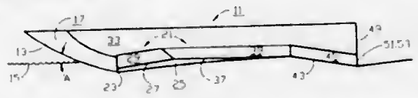
U.S. Cl. 114—271 **13 Claims**



1. A hull shape of a small watercraft comprising a hull bottom which is substantially V-shaped in transverse section and on whose underside at least one longitudinal chine, extending in a longitudinal direction from the aft part toward the fore part of a hull, and at least one backwardly curved unitary transverse chine, continuously extending in transverse directions substantially across the fore part of said hull, are provided protruding from said hull bottom, and wherein said unitary transverse chine is formed in such a manner as to cross one of (a) the forward part of said longitudinal chine and (b) an imaginary line extended forwardly from said longitudinal chine.

5,588,389
DUAL LIFT BOAT HULL
Jay Carter, Jr., 1404 Chaparral, Burkburnett, Tex. 76354
Filed Mar. 30, 1995, Ser. No. 413,605
Int. Cl.[6] B63B *1/00*

U.S. Cl. 114—271 **9 Claims**



1. A dual lift boat hull comprising:

a bow lifting surface having a first angle of attack selected to maximize lift to drag;

a stepped bottom aft of the bow lifting surface to create an air space between the water and the bottom of the hull at cruising speeds;

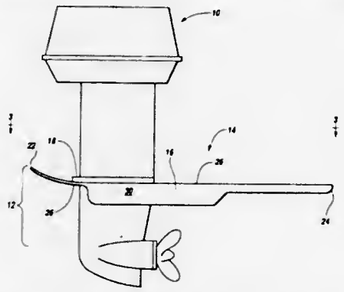
a stern lifting surface extending downwardly from the stepped bottom and having a second selected angle of attack relative to the water flow to maximize lift to drag;

wherein the hull is flat bottomed and said first and said second selected angles of attack are in a range of about six to eight degrees; and

whereby the bow lifting surface and the stern lifting surface maximize lift and reduce drag by lifting the hull and stepped bottom vertically to reduce the wetted hull surface area and enhance performance.

5,588,390
UNIVERSAL CAVITATION PLATE SYSTEM
Leon D. French, Rte. 3, Box 87-L, Los Fresnos, Tex. 78566
Filed Dec. 22, 1995, Ser. No. 557,476
Int. Cl.[6] B63B *1/24*

U.S. Cl. 114—274 **12 Claims**



1. A universal cavitation plate assembly comprising:

a cavitation plate having

a leading edge,

a trailing edge on the opposite side of the cavitation plate from the leading edge, and

a longitudinal slot opening in the trailing edge and extending toward the leading edge for part of a length of the cavitation plate, where the slot has a forward portion toward the leading edge, and where the longitudinal slot receives a lower unit of a boat engine, and where the longitudinal slot has at least one ledge;

an elastomeric insert adapted to fit in the longitudinal slot of the cavitation plate at the forward portion between the forward portion and the lower unit, and where the elastomeric insert has a tongue adapted to overlap said at least one ledge; and

a filler piece to occupy space remaining in the longitudinal slot between the lower unit and the trailing edge.

5,588,391
FIN WITH TRAILING EDGE FIXED FLAPS FOR SHIPS
Alain Tessandier, Le Havre, France, assignor to Societe Nouvelle des Ateliers et Chantiers du Harve, Le Havre, France
Filed May 17, 1995, Ser. No. 443,404
Claims priority, application France, Dec. 29, 1994, 94 15881
Int. Cl.[6] B63B *1/22*

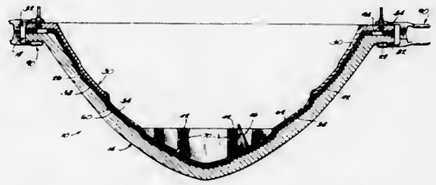
U.S. Cl. 114—284 **12 Claims**

1. A fin with trailing edge fixed flaps for ships comprising a main fin to which is operatively associated at least one pair of fixed flaps of mean camber, said fixed flaps being located near a trailing edge of said main fin and placed symmetrically on a lower face and an upper face of said main fin, said main fin being equipped with end plane plates and struts on which are fixedly connected said at least one pair of fixed flaps,

wherein said at least one pair of flaps is placed so that tangents to said mean camber at said leading edge are parallel to a mean plane of said main fin.

5,588,392
RESIN TRANSFER MOLDING PROCESS
Francis V. Bailey, Racine, Wis., assignor to Outboard Marine Corporation
Filed Apr. 18, 1995, Ser. No. 423,783
Int. Cl.[6] B63B *5/24*

U.S. Cl. 114—357 **21 Claims**



1. A method for manufacturing, in a resin transfer molding process, a fiber-reinforced polymer object having first and second exterior surface portions, the method comprising the steps of

providing a first mold with an inner surface,

placing dry reinforcement material on the first mold inner surface,

providing a second mold including at least one flexible portion with an inner surface having the shape of the object first exterior surface portion, and the second mold also including at least one rigid portion with an inner surface having the shape of the object second exterior surface portion,

placing the second mold over the dry reinforcement material to define a space between the first mold inner surface and the inner surfaces of the flexible and rigid portions,

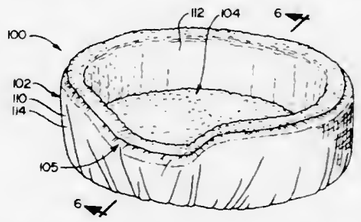
reducing the pressure, relative to ambient pressure, in the space between the molds,

injecting resin into the space, and

curing the resin.

5,588,393
COLLAPSIBLE PET BED
Eric W. Heilborn, 2216 I St., Bellingham, Wash. 98225
Filed Jun. 19, 1995, Ser. No. 491,786
Int. Cl.[6] A01K *1/035*

U.S. Cl. 119—285 **11 Claims**



1. A pet bed which is collapsible as a unit for packaging, said bed comprising:

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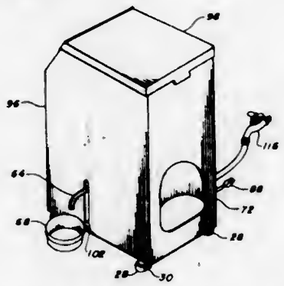
a generally planar cushion member;
a resiliently collapsible wall member which at least partially surrounds said cushion member when said bed is in an expanded configuration; and
a fabric cover member, said cover member comprising:
a first enclosure enclosing said cushion member; and
a second enclosure enclosing said wall member;
said second enclosure being attached to said first enclosure at a junction along an edge thereof, at least a part of said junction being displaceable in a vertical direction relative to said wall member so as to permit said cushion member in said first enclosure to be tilted up as first and second portions of said wall member are pushed together, to a collapsed position in which said cushion member is substantially parallel to and sandwiched between said first and second portions of said wall member.

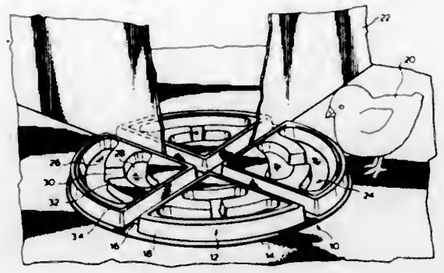
5,588,394
AUTOMATIC ANIMAL FEEDER
Thomas R. Ballstreri, 2177 W. Forest La., Anaheim, Calif. 92804
Filed Sep. 1, 1995, Ser. No. 522,698
Int. Cl.[6] A01K *5/02;7/02*
U.S. Cl. 119—51.11 **12 Claims**



1. An automatic dry feed and water animal feeder comprising:
mounting means having a substantially rigid vertical structure on a horizontal base for resting on a flat surface,
feed storage means attached to the mounting means vertical structure for retaining a reserve of animal feed,
weight actuated feed measuring means in intimate relationship with the storage means for metering and dispensing a predetermined amount of feed and water from the storage means when weight is added,
animal feed access means directly beneath the measuring means for receiving feed from the measuring means while providing a convenient receptacle for an animal to approach the feed,
weight adding and timing means to sequence interval and duration of adding weight to the measuring means for automatic operation of the feeder, and
reset means to restore the measuring means to a replenished position after weight has been removed therefrom.

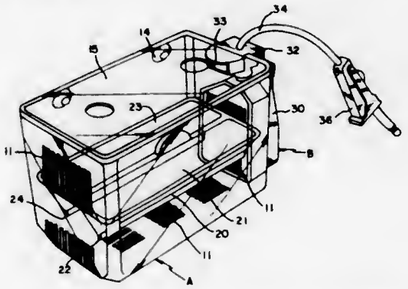
5,588,395
DRINKING TRAY FOR SMALL ANIMALS SHIPPED IN CONTAINERS
Eng-Hong Lee, 7 Tamarack Place, Guelph, Ontario, Canada
Filed Apr. 6, 1993, Ser. No. 43,488
Int. Cl.[6] A01K *7/00*
U.S. Cl. 119—72 **5 Claims**

1. In combination a shipping container for transport of small animals, the shipping container being divided into at least two sections by at least one removable divider, and a transport drinking tray, the drinking tray comprising a plurality of fluid containment



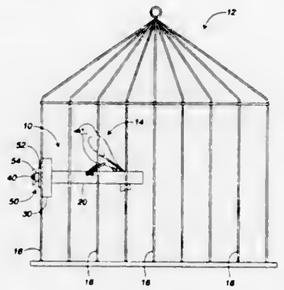
regions mounted on a common base each of the regions being provided with a drinking trough, the fluid containment regions being separated by slots extending across the base, the slots receiving the removable dividers to provide one fluid containment region for each section of the shipping container and to stabilize all of the drinking troughs through the contact of the dividers and the common base.

5,588,396
SPAWNING CASE FOR USE IN AN AQUARIUM
Nobuyuki Yoshida, Tokyo, Japan, assignor to Nihon Doubutsu Yakuhin Kabushikigaisya, Tokyo, Japan
Filed Apr. 21, 1995, Ser. No. 426,714
Claims priority, application Japan, May 17, 1994, 6-006539 U
Int. Cl.[6] A01K *63/00*
U.S. Cl. 119—252 **5 Claims**



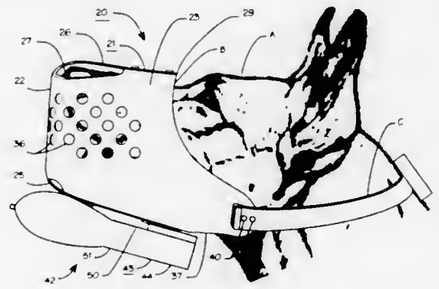
3. A fish spawning case for disposition in an aquarium comprising:
a rectangular case body for disposition interiorly of an aquarium having water therein;
said case body having a bottom wall and side walls extending upwardly from aid bottom wall;
said bottom wall having a plurality of passage openings and two opposing side walls of said case body having a plurality of passage openings for communicating with the interior thereof;
a filter removably mountable on an external surface of one of said opposing side walls of said case body;
said filter having an intake on a side thereof for fluid communication with said passage openings on said one of said opposing side walls and a discharge port on an upper portion thereof; and
said discharge port including means for selectively directing flow from said filter toward either the interior or the exterior of said case body.

5,588,397
BIRD PERCH APPARATUS
E. Kimble Johnakin, III, Alpharetta, Ga., assignor to Just Selling, Inc., Clermont, Ga.
Filed Feb. 17, 1995, Ser. No. 390,632
Int. Cl.[6] A01K *31/12*
U.S. Cl. 119—468 **22 Claims**



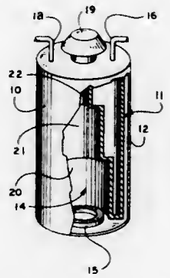
1. A bird perch apparatus for connection to a structure, the apparatus comprising:
an elongated first member,
wherein said first member includes
a first end,
a second end, and
an exterior first surface extending between said first end and said second end and including a first plurality of grits, and
wherein the elongated axis of said first member extends in a direction defined generally between said first end and said second end, and
a second member connected to said first member proximate to said second end and extending generally perpendicularly and substantially away from said first surface of said first member and said elongated axis for generally 360 degrees about said elongated axis, wherein said second member includes an exterior second surface including a second plurality of grits.

5,588,398
REMOTELY CONTROLLED DOG MUZZLE
Harvey S. Allen, II, 437 N. Olive, Orange, Calif. 92666; E. William Berke, 2949 Feather Hill, Orange, Calif. 92667, and Gary B. Erwin, Ocoee, Tenn., assignors to Harvey S. Allen, II; E. William Berke, both of Orange, Calif.; Ken Newgard, Kalispell, Mont., and Nicholas Vertucci, Irvine, Calif.
Filed May 15, 1995, Ser. No. 441,423
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—822 **27 Claims**



1. An apparatus for use with trained dogs comprising:
a. a stimulus module for producing stimuli perceptible by humans in the presence of the dog, said stimulus module being remotely actuatable,
b. remote controller means for remotely actuating said stimulus module, and
c. means for removably attaching said stimulus module to the body of a dog, said means including,
i. a muzzle including a cup-shaped snout shield,
ii. means for attaching said muzzle to the body of a dog, and
iii. means for attaching said stimulus module to said muzzle.

5,588,399
FLUE FOR WATER HEATER
Thomas K. Kim, 1168 Forest Vale La., BB-8, Norcross, Ga. 30093
Filed Jun. 16, 1995, Ser. No. 491,263
Int. Cl.[6] F22B *5/00*
U.S. Cl. 122—17 **6 Claims**



1. A water heater comprising a water tank defining at least one flue opening through said water tank, heating means disposed beneath said water tank and generally aligned with said flue opening so the heat rising from said heating means will pass through said flue opening, said flue opening comprising at least a first section having a relatively large diameter and a second section having a smaller diameter than said first section, a step defined between said first section and said second section, said step consisting of the transition between said first section and said second section, said first section and said second section being coaxial, and wherein said step comprises a surface disposed at an acute angle with respect to the wall of said first section.

5,588,400
METHOD OF GENERATING STEAM IN A FORCED-THROUGH-FLOW BOILER
Ion Stefan, and Friedrich Cesnik, both of Gummersbach, Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Germany
PCT No. PCT/EP94/00367, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO94/18498, PCT Pub. Date Aug. 18, 1994
PCT Filed Feb. 9, 1994, Ser. No. 313,170
Claims priority, application Germany, Feb. 9, 1993, 43 036 13.9
Int. Cl.[6] F22D *7/00*
U.S. Cl. 122—406.1 **5 Claims**

1. A method of generating steam in a forced-through-flow boiler, said method including the steps of:
during operation, conveying water through a preheater and an evaporator, whereby for a forced-through-flow boiler operated with a flow of gas from which waste heat is to be extracted, said evaporator is divided into at least two sections, wherein when viewed in a direction of flow of said gas from which waste heat is to be extracted, a first one of said evaporator

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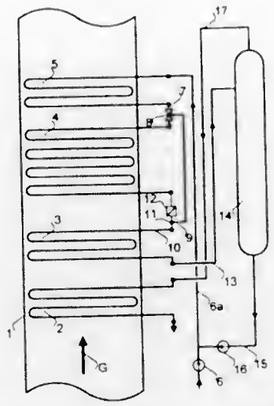


sections is supplied with water at a beginning of a start-up phase and is included in a water circulation, while downstream from said first evaporator section when viewed in said direction of flow of said waste heat gas, a second one of said evaporator sections, starting from a dry state, is gradually supplied with water in a controlled manner until, in an operating state, water successively flows through both of said evaporator sections;

at least during said start-up phase, conveying a water-stream mixture from said first evaporator section to a separation tank, from which steam is withdrawn and separated feed water is supplied to said preheater, which is disposed downstream from said second evaporator section when viewed in said direction of flow of said waste heat gas; and

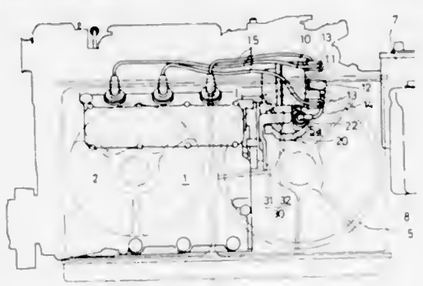
disposing a three-way valve in a connecting line between said preheater and said evaporator, with said three-way valve having a branch line that acts as a bypass line and leads to said first one of said evaporator sections.

5,588,401

SPARK IGNITION INTERNAL-COMBUSTION ENGINE

Yakihiro Matsumoto, and Hisashi Yokotaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 405,248
Claims priority, application Japan, Mar. 18, 1994, 6-072833
Int. Cl.[6] F02D *7/00*
U.S. Cl. 123—41.31 **30 Claims**



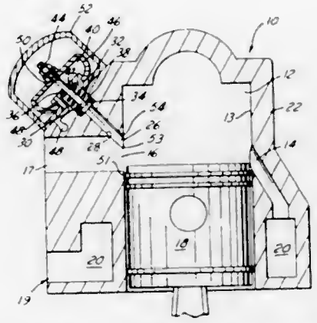
1. A spark ignition internal-combustion engine comprising an ignition coil mounted on an engine body in the vicinity of a distributor fixedly mounted directly on said engine body, said ignition coil being disposed directly behind an opening section of a radiator fan.

5,588,402

CONTROL DEVICE FOR EXHAUST TIMING OF A TWO CYCLE ENGINE USING INTAKE SYSTEM PRESSURE

Thomas G. Lawrence, Clarkston, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Nov. 6, 1995, Ser. No. 553,911
Int. Cl.[6] F02B *75/02*
U.S. Cl. 123—65 PE **7 Claims**



1. In a two-stroke cycle internal combustion engine including a cylinder having an exhaust port and intake port leading thereto, said exhaust port being positioned through a side wall of said cylinder, a piston that is axially reciprocal in said cylinder and adapted to open and close said exhaust port through said side wall, an intake system including a variable speed pump for providing positive pressure to said intake system downstream of said pump that leads to said intake port, a barrier member being mounted in said engine adjacent to one of said exhaust or intake port and adjustable between a first position, in which said port is exposed to said cylinder along its full axial extent and a second position, in which said barrier member obstructs said port from communication with said cylinder for a portion of the axial extent of said port, a positioning drive mechanism operably connected to said barrier member between said first and second positions; the improvement characterized by:

the positioning drive mechanism being constructed to be controlled in part by said pressure in said intake system downstream of said pump and developed by said pump.

5,588,403

RACK AND PINION VALVE OPERATING SYSTEM

Douglas J. Williams, 25940 Coloretti Ct., Valencia, Calif. 91335

Continuation of Ser. No. 160,448, Dec. 1, 1993, abandoned, which is a continuation of Ser. No. 971,948, Nov. 4, 1992, abandoned. This application May 25, 1995, Ser. No. 450,013
Int. Cl.[6] F01L *9/04;1/30*
U.S. Cl. 123—90.11 **2 Claims**

1. A valve assembly for an internal combustion engine having a crankshaft for moving a piston within a cylinder, the cylinder having a bore, at least one opening into the bore, and a head interconnected at the cylinder opening and the head having a cavity with the cavity having at least one opening, comprising,

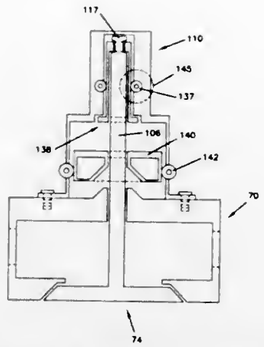
a) a valve disposed within the cavity of the head and having a valve stem and a valve head, wherein the valve head is positioned adjacent the cylinder opening for being moved between:

1) an open position of the cylinder opening, wherein, gas flow is enabled between the cylinder bore and the head; and

2) a closed position of the cylinder opening, wherein, gas flow is disabled between the cylinder bore and the head;

b) sensor means for determining the position of the crankshaft and producing a position signal in response thereto;

c) command mechanism, coupled to the sensor means, for processing the position signal and producing a variable valve drive signal in response thereto; and



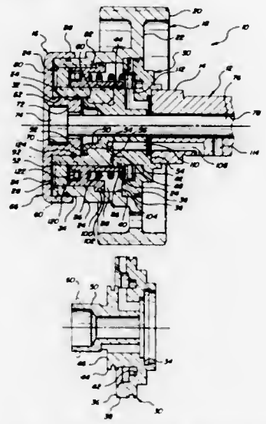
d) an actuator electrically coupled to the command mechanism, for intermittently and variably moving the valve between the open and closed position in response to the variable valve drive signal received from the command mechanism, the actuator including a rack and pinion gear system for transforming rotary motion from a motor into linear motion of the valve, the valve being connected with a rack moving in a linear non-rotatable motion, and the pinion engaging with the rack and being coupled to said motor to rotate the pinion.

5,588,404

VARIABLE CAM PHASER AND METHOD OF ASSEMBLY

Thomas H. Lichti, Rochester; Daniel R. Cuatt; Mark A. Shost, both of Henrietta; Ronald A. Waydelis, Rochester, and Michael J. Fox, Stafford, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1994, Ser. No. 353,776
Int. Cl.[6] F01L *1/344*
U.S. Cl. 123—90.17 **18 Claims**



1. A variable cam phaser including coaxial drive and driven members drivingly connected by a first annular phase control piston having inner and outer helical splines of varying lead engaging respective mating splines of said members, the piston being axially movable to vary the phase relation between said drive and driven members, force means operative to act against the piston for moving the piston axially, and the improvement comprising:

one of said drive and driven members including a hub provided with outer helical splines as part of said mating splines and a hub flange supporting the hub; and

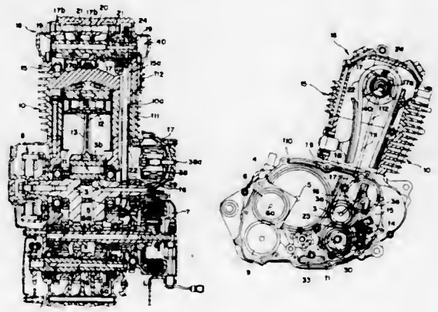
locking means operative in an unlocked position to allow angular adjustment of said hub on said hub flange after assembly with the other of said drive and driven members to provide a selected angular orientation of said drive and driven members, said locking means being movable to a locked position wherein it is operative to maintain said angular orientation until installation of the cam phaser on a camshaft.

5,588,405

ARRANGEMENT OF OIL PASSAGE TO VALVE SYSTEM

Atsushi Sawa, and Hiroyuki Kawakubo, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 476,571
Claims priority, application Japan, Dec. 28, 1994, 6-337588
Int. Cl.[6] F01M *5/00;9/10*
U.S. Cl. 123—90.33 **20 Claims**



1. An arrangement of oil passages for a valve system for an internal combustion engine, the engine having a cylinder block and a cylinder head, the arrangement comprising oil passages extending to a valve system of the engine, at least one of the oil passages being formed integrally with the cylinder block and the cylinder head, the at least one oil passage formed integrally with the cylinder block and cylinder head being disposed along outer surfaces of the cylinder block and cylinder head, a valve system drive transmission being disposed between the at least one oil passage and a combustion chamber of the engine.

5,588,406

STRUCTURE FOR LUBRICATING CAM SLIDING SURFACE IN AN INTERNAL COMBUSTION ENGINE

Katsuhiko Ito; Hideo Kobayashi; Yukio Ishiuchi, and Toshio Shimada, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 501,863
Claims priority, application Japan, Jul. 13, 1994, 6-184101
Int. Cl.[6] F01M *9/10;1/06;* **F01L** *1/04*
U.S. Cl. 123—90.34 **17 Claims**

9. A lubricating section for a cam sliding surface in an internal combustion engine comprising:

a cam shaft having at least one cam surface defining a base circle for operatively imparting motion to a cam follower;

at least one recessed portion extending in an axial direction of said cam shaft, said recessed portion being formed on said base circle of said cam surface;

projecting ribs extending across a predetermined circumference of said cam shaft for directing lubrication into said recessed portion.

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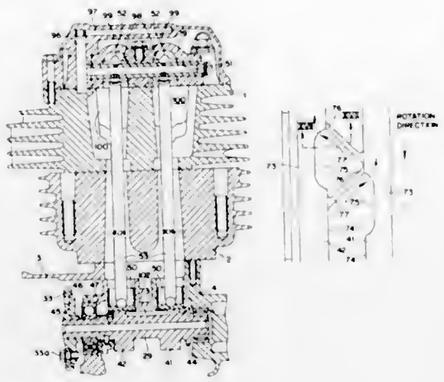
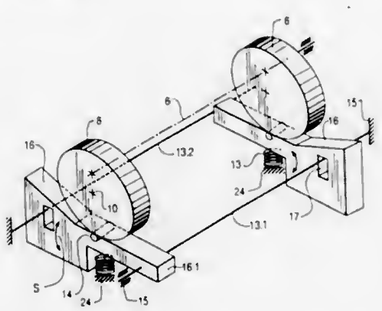


5,588,407
RECIPROCATING PISTON ENGINE WITH WEIGHT COMPENSATION

Mathias von Essen, Alsdorf; Christoph Bollig, Stolberg, and Werner Bick, Würselen, all of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany

Filed Dec. 1, 1994, Ser. No. 352,806
Claims priority, application Germany, Dec. 1, 1993, 9318308 U; Apr. 29, 1994, 9407145 U
Int. Cl.[6] F02B *75/06*
U.S. Cl. 123—192.2 **12 Claims**

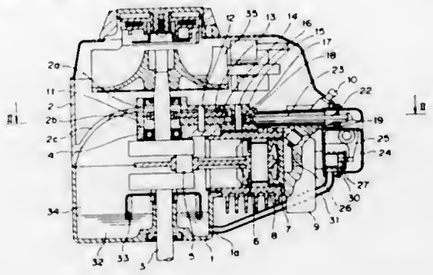


1. A reciprocating piston engine, comprising:
an engine housing having at least one piston cylinder formed therein;
a piston located within the piston cylinder and being movable in a back-and-forth motion therein;
a crankshaft connected to said piston and being driven by said piston to rotate about an axis;
a cam disc connected to said crankshaft so as to rotate therewith, said cam disc having a selected control profile;
at least one compensating weight attached to said engine housing and being in engagement with the control profile of said cam disc, said compensating weight being driven by said cam disc in a predetermined back and forth motion as a function of the rotation of the crankshaft so as to compensate for at least one of inertia forces and moments of inertia occurring in the piston engine; and
at least one torsion spring connected to said compensating weight and urging said compensating weight in a direction of said cam disc to maintain a constant contact between the control profile of said cam disc and said compensating weight.

5,588,408
ENGINE UNIT

Katsumi Korihara, Nagoya, Japan, assignor to Ryobi Limited, Tokyo, Japan

Filed Dec. 21, 1995, Ser. No. 576,299
Claims priority, application Japan, Dec. 22, 1994, 6-336145
Int. Cl.[6] F01M *9/06*
U.S. Cl. 123—196 W **6 Claims**



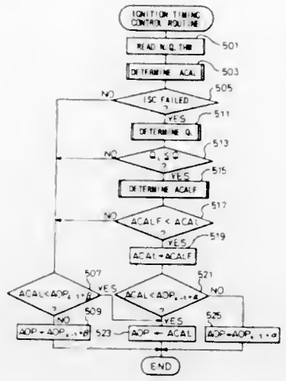
1. An engine unit comprising:
a housing defining a crank chamber and a cam chamber which is communicated with said crank chamber therein;
a crank shaft disposed in the crank chamber to be rotatable so as to extend in a perpendicular direction in a state of use;
a piston-cylinder assembly mounted to the housing and including a cylinder and a piston operatively connected to the crank shaft;
a valve mechanism operatively connected to the piston-cylinder assembly for sucking and discharging air in the cylinder;
a valve moving mechanism for driving the valve mechanism so as to open or close the same, said valve moving mechanism including a push-rod means;
a push-rod cover member covering the push-rod means with a space therebetween;
a rocker chamber connected to the push-rod cover so as to communicate with said space;
a drain passage means disposed between said rocker chamber and said crank chamber so as to establish communication therebetween with an inclination in the state of use;
an agitation means mounted to said crank shaft so as to agitate and splash a lubrication oil in the crank chamber; and
a guide means provided for the housing for guiding the splashed lubrication oil to said valve moving mechanism.

5,588,409
IGNITION TIMING CONTROL DEVICE FOR AN ENGINE

Hiroyuki Mizuno, Toyota; Akio Okamoto, Takahama, and Suehiro Kubo, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 3, 1995, Ser. No. 497,894
Claims priority, application Japan, Jul. 19, 1994, 6-166924; Apr. 28, 1995, 7-106442
Int. Cl.[6] F02D *41/16;* **F02P** *5/15*
U.S. Cl. 123—339.11 **13 Claims**

1. An ignition timing control device for an engine, said engine comprising an inlet air passage and a throttle valve disposed on said inlet air passage, an inlet air bypass passage connecting the portions of the inlet air passage upstream and downstream of the throttle valve for supplying inlet air to the engine without passing through the throttle valve, and an idle speed control means for controlling the idle speed of the engine by adjusting the amount of air passing through the inlet air bypass passage, wherein said ignition timing control device comprises:
an engine load condition detecting means for detecting the load condition of the engine;
a failure detecting means for detecting the failure of the idle speed control means; and,

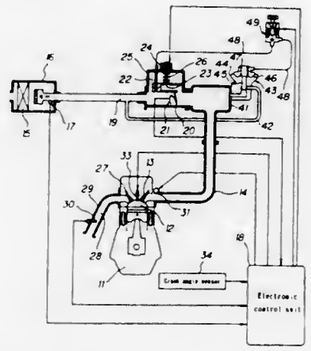


an ignition retarding means for retarding the ignition timing of the engine by an amount determined in accordance with the engine load conditions detected by the engine load condition detecting means when the idle speed control means fails.

5,588,410
AIR-FUEL RATIO CONTROL METHOD

Hiroki Tamura; Naoki Yamazaki; Akihiro Takeyama; Hitoshi Kamura, all of Tokyo, and Tetsuo Maeda, Himeji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP95/00680, § 371 Date Oct. 12, 1995, § 102(e) Date Oct. 12, 1995, PCT Pub. No. WO95/27846, PCT Pub. Date Oct. 19, 1995
PCT Filed Apr. 6, 1995, Ser. No. 532,669
Claims priority, application Japan, Apr. 7, 1994, 6-069265
Int. Cl.[6] F02D *41/14*
U.S. Cl. 123—416 **20 Claims**

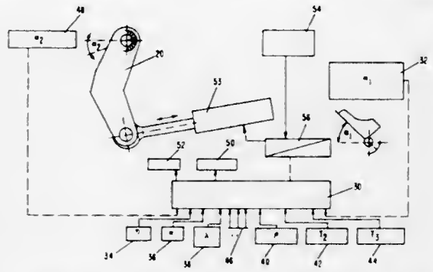


1. An air-fuel ratio control method for selecting a stoichiometric air-fuel ratio and a lean air-fuel ratio as a target air-fuel ratio for an engine to control the air-fuel ratio of the engine depending on the selected target air-fuel ratio, said engine having multiple cylinders, variable ignition timing control, and variable intake air flow control, said method comprising:
changing said air-fuel ratios for each said cylinder over respectively offset timing intervals during said changing of said air-fuel ratio to said target air-fuel ratio; and
varying intake air flow during said change.

5,588,411
METHOD FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE WITH EXTERNAL IGNITION SYSTEM AND WITH A FUEL INJECTION SYSTEM

Peter Kreuter, and Peter Heuser, both of Aachen, Germany, assignors to Meta Motoren- und Energie-Technik GmbH, Herzogenrath, Germany

Filed Jan. 18, 1996, Ser. No. 599,435
Claims priority, application Germany, Jan. 18, 1995, 195 01 386.7
Int. Cl.[6] F02P *5/00*
U.S. Cl. 123—418 **24 Claims**

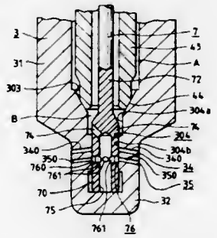


1. A method for controlling power output of an internal combustion engine with an external ignition system; said method comprising the steps of:
providing at least one inlet valve for each cylinder of the internal combustion engine for determining the charge input of a combustion chamber during an intake stroke of the internal combustion engine;
providing a fuel injection system for injecting, in an injection step, fuel into the combustion chamber;
setting with a control device a relative phase position between a first and a second cam shaft operating at identical rpm for determining an opening function of the inlet valve, the opening function being defined by the stroke and duration of an open state of the inlet valve;
adjusting a position of the control device according to an accelerator pedal position and at least one operational parameter of the combustion engine; and
controlling at least one of the ignition timing and the amount of injected fuel directly according to the position of the control device and the rpm of the internal combustion engine.

5,588,412
VARIABLE INJECTION HOLE TYPE FUEL INJECTION NOZZLE

Shinya Nozaki, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Nov. 22, 1995, Ser. No. 562,168
Claims priority, application Japan, Nov. 25, 1994, 6-314338
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—496 **7 Claims**



1. A variable injection hole type fuel injection nozzle, comprising:

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a nozzle needle having a seat portion;

a nozzle body into which said nozzle needle is inserted, said nozzle body having a bottomed hole for guiding pressurized fuel to a leading end portion of said nozzle needle below the seat portion of said nozzle needle, and at least first and second injection hole groups at axially different first and second positions in a side wall of the bottomed hole, respectively, said first injection hole group having a plurality of injection holes being different in diameter from those of said second injection hole group;

a spring;

a spool valve having a valve portion which passes through an axial center of said nozzle needle and a leading end portion fitted into the bottomed hole of said nozzle body, said valve portion being urged by said spring so that a lower end of said valve portion abuts against a base of said bottomed hole in a normal condition, said valve portion defining a fuel passage therein, said fuel passage communicating with said first injection hole groups in the normal condition and communicating with said second injection hole group at a position where said valve portion is displaced axially against a force of said spring on receiving the pressure of the pressurized fuel; and

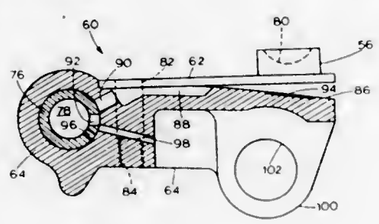
braking means arranged in an upper region of said spool valve for selectively securely holding said valve portion of said spool valve at one of said first and second positions.

5,588,413

ENGINE ASSEMBLY WITH LEAF SPRING CAM FOLLOWER

Dwight V. Stone, East Peoria, Ill.; Douglas A. Long, Delphi, Ind., and Jose M. Salazar-Vior, Washington, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 14, 1995, Ser. No. 404,025
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—508 **15 Claims**



1. An engine assembly comprising:

an engine block having a cylinder disposed therein;

a fuel injector for periodically injecting fuel into said cylinder;

a pushrod;

a rocker arm disposed for periodic movement and having a first end and a second end, said first end of said rocker arm being disposed adjacent said fuel injector and said second end of said rocker arm being disposed adjacent said pushrod;

a cam shaft having a cam; and

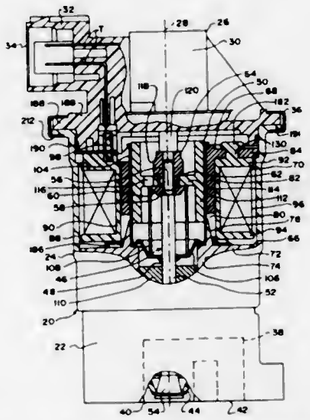
a cam follower operatively coupled between said cam and said pushrod, said cam follower having a first portion which supports a cam roller and a second portion which makes contact with said pushrod, said second portion of the cam follower comprises a flexible plate, said first and second portions of said cam follower being spring-biased with respect to each other.

5,588,414

CONSTRUCTION FOR MAINTAINING ASSEMBLED AXIAL INTEGRITY OF AN ELECTRICALLY ACTUATED VALVE

Bernard J. Hrytzak, Chatham, Canada; Takeshi Gomi, Saitama, Japan; Hirotomi Nemoto, Saitama, Japan, and Yoshio Yamamoto, Saitama, Japan, assignors to Siemens Electric Limited, Ontario, Canada, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 520,543
Int. Cl.[6] F02M *25/07;* **F16K** *37/00;* **H01F** *7/08*
U.S. Cl. 123—571 **13 Claims**



1. An electric exhaust gas recirculation (EEGR) valve for an internal combustion engine comprising an enclosure including a base, an entrance at which engine exhaust gas to be recirculated enters said base, a passage that extends through said base for conveying engine exhaust gas that has entered said entrance, an exit at which engine exhaust gas that has passed through said passage exits said base, a valve mechanism disposed within said base for controlling flow through said passage, an electric actuator disposed within said enclosure for operating said valve mechanism, said enclosure comprising a shell having a sidewall terminating at an axial end axially beyond said electric actuator relative to said valve mechanism, said axial end comprising a radially outwardly directed rim, a closure closing said axial end and having a rim of polymeric material disposed against said rim of said axial end of said shell sidewall, and means for clinching said rims in assembly comprising a circular ring having a sidewall disposed radially outward of and axially overlapping both said rims, said circular ring comprising a first flange directed radially inwardly of said ring's sidewall to radially overlap said rim of said closure and a second flange directed radially inwardly of said ring's sidewall to radially overlap said rim of said axial end of said shell sidewall, and said circular ring further comprising a plurality of circumferentially arranged sharp pointed barbs that bite into the polymeric material of said closure rim, and said ring exerting axial forces forcing said rims axially together.

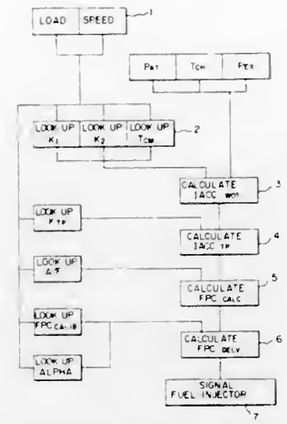
5,588,415

ENGINE MANAGEMENT SYSTEM

Steven R. Ahern, Claremont, Australia, assignor to Orbital Engine Company Pty. Limited, Balcatta, Australia

Division of Ser. No. 87,712, Jul. 14, 1993, Pat. No. 5,427,083. This application Jun. 7, 1995, Ser. No. 475,346
Claims priority, application Australia, Jan. 14, 1991, PK4177
Int. Cl.[6] F02M *51/00*
U.S. Cl. 123—676 **6 Claims**

1. A method for controlling fuel supplied to an internal combustion engine based upon determination of induced air mass per



cylinder per cycle therethrough (IACC) without need for an air flow sensor, comprising the steps of:

determining engine operating characteristics from tests conducted on a representative sample of a family of engines at ambient conditions and at selective elevated charge air temperatures (T_{CH}) while keeping all other conditions equal, repeating these tests at a series of engine speed and load combinations, taking measurements of charge temperature (T_{CH}), and developing therefrom look-up maps so that T_{CH} and a selected load demand coefficient K_{LD} can be looked up for any combination of engine speed and load;

conducting further tests on said representative sample engine and taking measurements of at both wide open throttle (WOT) and over a range of engine speeds at ambient conditions and at induced exhaust back pressures respectively and, using these measurements and the previously developed look-up maps of T_{CM} and K_{LD}, developing look-up maps of cylinder displacement constant (K_1) and exhaust pressure coefficient (K_2) over said speed range;

inputting signals to a memory of ECU lookup maps of respective coefficients relating to P_{AT}, P_{EX} and T_{CH} for selected engine speeds within said range of engine speeds corresponding to an operating speed range of an operational engine;

inputting signals to memory of the ECU look up maps of coefficients relating $IACC_{WOT}$ to IACC at selected load demands below WOT at each said selected speed;

providing input signals to the ECU of T_{CH}, P_{AT} and P_{EX} from said sensors while operating engines of said family;

calculating $IACC_{WOT}$ from said input signals and said look up maps provided said ECU;

calculating based upon $IACC_{WOT}$, a value for fuel per cylinder per cycle to be delivered to the engine (FPC_{DELV});

providing a signal from said ECU to the engine of FPC_{DELV} to control the delivery of the fuel;

subsequent to said tests, operating engines of said family with sensors provided to obtain signals indicating respectively engine load, engine speed, charge air temperature (T_{CH}), ambient pressure (P_{AT}), and exhaust pressure (P_{EX});

calculating from sensor signals T_{CH}, P_{AT}, P_{EX}, and using values from look-up maps of K_1, K_2, and T_{CM} based on engine load and engine speed, a value for $IACC_{WOT}$ in accordance with the algorithm

$$IACC_{WOT} = \frac{K_1 \times D_{CM} \times P_{AT}\,[1 - K_2\,(P_{EX})]/[P_{AT}]}{T_{CM} + T_{CH}}$$

wherein $IACC_{WOT}$ is induced air mass per cylinder per cycle at wide open throttle and D_{CM} is a calibration coefficient previously determined experimentally;

looking up a value of K_{LD} based upon load and speed, and calculating a value of $IACC_{LD}$ for existing engine operating conditions according to $IACC_{LD}=IACC_{WOT} \times K_{LD}$; and

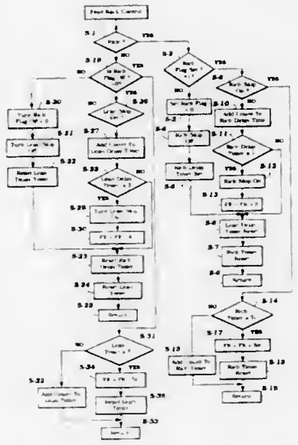
controlling fuel supply to the engine based upon said calculated $IACC_{LD}$.

5,588,416

FUEL CONTROL SYSTEM FOR GASEOUS FUELED ENGINE

Toshio Suzuki, and Yoshikatsu Iida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 9, 1995, Ser. No. 401,344
Claims priority, application Japan, Mar. 15, 1994, 6-044235
Int. Cl.[6] F02D *41/14*
U.S. Cl. 123—684 **62 Claims**



1. A method of controlling the mixture strength of an engine with a feedback control comprising the steps of supplying fuel to a charge former in an mount determined by at least one engine running condition, sensing the mixture strength, comparing the mixture strength with the desired mixture strength, and adjusting in steps the amount of fuel supplied in a direction to obtain the desired mixture strength and controlling the character of the steps of adjustment in response to at least one engine running condition.

5,588,417

ENGINE AIR/FUEL CONTROL WITH EXHAUST GAS OXYGEN SENSOR HEATER CONTROL

Allan J. Kotwicki, Dearborn; Jeffrey A. Doering, Southfield, and Michael P. Falandino, Wyandotte, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 267,735, Jun. 29, 1994. This application Nov. 2, 1995, Ser. No. 552,047
Int. Cl.[6] F02P *15/08*
U.S. Cl. 123—697 **16 Claims**

1. A method for controlling engine air/fuel ratio in response to a two-state output of an exhaust gas oxygen sensor and controlling an electric heater coupled to the sensor, comprising the steps of:

measuring peak-to-peak excursion in the two-state sensor output, said measurement occurring continuously while the electric heater is being controlled;

controlling electrical energy supplied to the electric heater in response to said indicating signal to maintain said peak-to-peak excursion within a desired range; and

adjusting fuel delivered to the engine in response to a feedback variable derived from the two-state sensor output.

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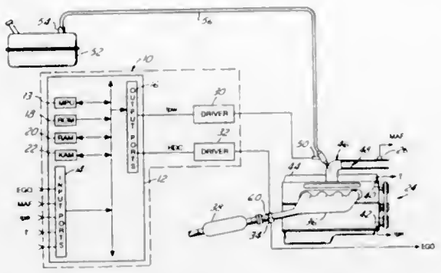
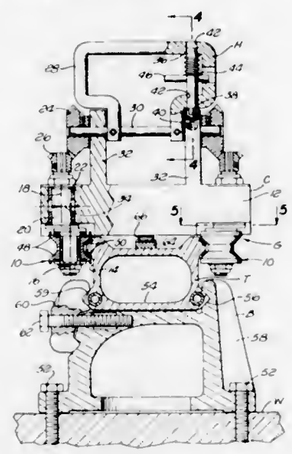


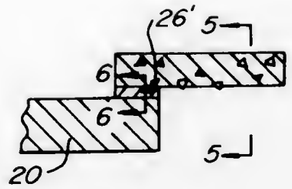
5,588,418
SAW ASSEMBLY WITH HANDLE-ACTUATED GUIDE MECHANISM
William K. Holmes, Simi Valley; Albert E. Joneikis, Long Beach, and Kwok W. Wong, Walnut, all of Calif., assignors to Boart Longyear Company, Salt Lake City, Utah
Filed Jan. 26, 1995, Ser. No. 390,306
Int. Cl.[6] B28D *1/04*
U.S. Cl. 125—13.01 **31 Claims**



1. A saw assembly comprising:
a track mountable to a wall, floor or ceiling;
a carriage guided by the track for movement along the length of the track, the carriage including a cutting mechanism and a carrying handle for manually grasping the carriage; and
a guide mechanism removably securing the movable carriage to the track, the guide mechanism comprising a pair of guide elements mounted on opposite sides of the carriage for pivotal movement in substantially opposite directions between an engaged position, in guiding contact with the track, and a retracted position, out of contact with the track, by movement of said carrying handle.

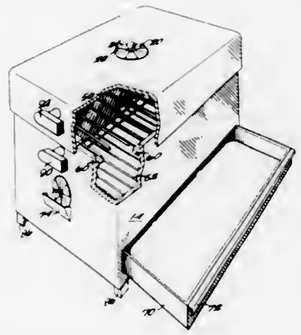
5,588,419
SEMICONDUCTOR WAFER HUBBED SAW BLADE
Charles N. Elsbree, Santa Rosa, Calif., assignor to Dynatex International, Santa Rosa, Calif.
Filed Dec. 16, 1994, Ser. No. 357,504
Int. Cl.[6] B28D *1/04*
U.S. Cl. 125—15 **4 Claims**

1. A saw blade comprising in combination:



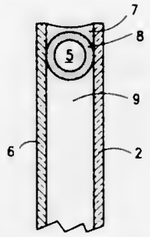
a circular aluminum blank for attaching to a saw blade arbor at a central aperture and a circular periphery defining e side for holding the saw blade;
a cutting rim bounded by peripheral sides, the cutting rim and the peripheral sides having plated nickel embedded abrading particles with abrading particles exposed on the peripheral sides of the cutting rim;
a copper substrate having a first opposite side and a second opposite side with the first opposite side fastened to the circular aluminum blank at the circular periphery defining a side and to one of the peripheral sides of the cutting rim on the second opposite side, the copper substrate having deposited abrading particles extending across an interface of the copper substrate with the cutting rim at the second opposite side.

5,588,420
CHARCOAL-BURNING OUTDOOR HEATER
Curtis M. Dickson, 1029 Lofty Pine Dr., Columbia, S.C. 29212
Filed Jun. 2, 1995, Ser. No. 459,819
Int. Cl.[6] A47J *37/00*
U.S. Cl. 126—25 R **13 Claims**



1. A heater, comprising:
a rectangular body having an interior, said body including
first ledges formed on said interior of said body, said first ledges running the periphery of said body,
second ledges formed on said interior of said body,
first venting means for venting said interior of said body, said first venting means positioned between said first ledges and said second ledges of said body,
and
a bottom;
a lid dimensioned to fit over said body, said lid having
second venting means for venting said interior of said body when said lid is on said body; and
a charcoal-supporting grill inside said body resting on said second ledges.

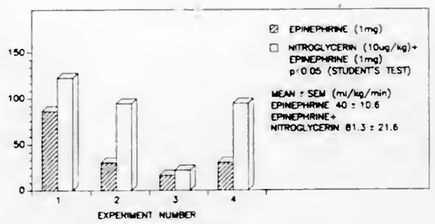
5,588,421
HEAT-INSULATING VIEWING WINDOW OR VIEWING DOOR FOR AN APPARATUS HAVING AN INTERIOR TEMPERATURE DEVIATING FROM THE AMBIENT TEMPERATURE THEREOF
Dietrich Busch, Simmern, and Roland Leroux, Stadacken-Elsheim, both of Germany, assignors to Schott Glaswerke, Malnz, Germany
Filed Sep. 29, 1994, Ser. No. 315,116
Claims priority, application Germany, Sep. 29, 1993, 43 33 033.9
Int. Cl.[6] F23M *7/00*
U.S. Cl. 126—200 **19 Claims**



1. A heat-insulating window in a door for an apparatus operable in an ambient atmosphere having a first temperature, the apparatus having an interior cavity at a second temperature deviating from said first temperature, said window in a door comprising:
a first plate having a side in contact with the ambient atmosphere;
a second plate having aside facing toward said interior cavity;
a frame common to said first and second viewing plates for holding said plates in spaced relationship to each other so that said plates define an intermediate space therebetween;
a third plate disposed in said intermediate space;
mounting means for mounting and holding said third plate in position between said first and second plates;
said third plate having a peripheral edge;
said mounting means being an elongated spacing member extending along said peripheral edge and joining said third plate to said first plate;
said elongated spacing member being a compressible tube;
said tube having an annular cross section and being defined by a wall having a substantially uniform thickness;
said first and third plates and said compressible tube conjointly defining an enclosure containing a gas which expands to increase pressure in said enclosure in response to a change of said second temperature relative to said first temperature;
a temperature-resistant adhesive for joining said compressible tube, said first plate and said third plate to each other; and,
said tube having an opening formed therein allowing gas in said tube to escape whereby said tube collapses to compensate for the increase in pressure of said gas contained in said enclosure.

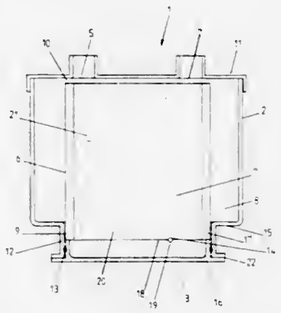
5,588,422
METHODS AND PHARMACEUTICAL COMPOSITIONS FOR ENHANCED CARDIOPULMONARY RESUSCITATION
Keith G. Lurie, and Barbara S. Gold, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Nov. 17, 1992, Ser. No. 977,498
Int. Cl.[6] A61M *15/00*
U.S. Cl. 128—200.24 **6 Claims**

1. A method for resuscitating a patient suffering from cardiac arrest, said method comprising:
(a) actively inducing venous blood transport into the heart and arterial blood transport from the heart;



(b) ventilating the patient's lungs;
(c) administering to the patient concurrently with said inducing and ventilating steps, a bolus of medicament comprising epinephrine and nitroglycerin in amounts of from 1 mg to 10 mg and 25 μg to 200 μg, respectively.

5,588,423
HUMIDIFIER CHAMBER
Malcolm D. Smith, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand
Filed Sep. 18, 1995, Ser. No. 529,523
Claims priority, application New Zealand, Aug. 20, 1994, 264485
Int. Cl.[6] A61M *16/16*
U.S. Cl. 128—203.26 **12 Claims**



1. A respiratory humidifier chamber for attachment to a heater base, said chamber comprising:
a closed watertight vessel having a heat conductive base,
said vessel having a gases inlet for receiving gases from a ventilator and a gases outlet for delivering humidified gases to a patient,
a thermal insulating partition inside said vessel dividing said vessel into a first heated reservoir, and a second supply reservoir, said first reservoir defined by at least said partition and a first portion of said vessel, said first portion including said heat conductive base, said second reservoir defined by at least said partition and a second portion of said vessel, said second portion not including said heat conductive base,
at least one liquid communication path between said first and second reservoirs at or adjacent the bottom of said partition,
and at least one gases communication path between said first and second reservoirs at or adjacent the top of said partition.

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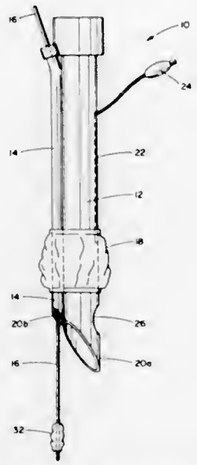
5,588,424

BRONCHIAL BLOCKER ENDOTRACHEAL APPARATUS

Steven R. Insler, Cleveland Heights, and Erik J. Kraenzler, Brecksville, both of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Jun. 28, 1995, Ser. No. 495,823
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—207.15 **20 Claims**



1. An endotracheal apparatus for insertion through the mouth and into the trachea of a patient for ventilating one lung and blocking the other lung comprising:

a first elongated flexible tube having an external wall portion, a proximal end and a distal end, the distal end being positioned in the trachea when in use and adapted for ventilating air;

a second elongated flexible tube, separate from the first tube, having a proximal end and a distal end, an external wall portion of the second elongated flexible tube being closely joined in a side-by-side relation to said external wall portion of the first elongated flexible tube, the second elongated flexible tube for receiving an endobrochial blocker;

a first inflatable and deflatable cuff extending about the first and second elongated flexible tubes toward the distal ends of the first and second tubes, the first inflatable and deflatable cuff being positioned and operable when inflated to engage the trachea;

an endobronchial blocker comprising an elongated catheter having a proximal end and a distal end, being slidably receivable in the second elongated flexible tube, the elongated catheter having an inflatable and deflatable cuff disposed about the distal end of the elongated catheter; and,

an air passage defined in a wall of the first elongated flexible tube and terminating within the first inflatable and deflatable cuff.

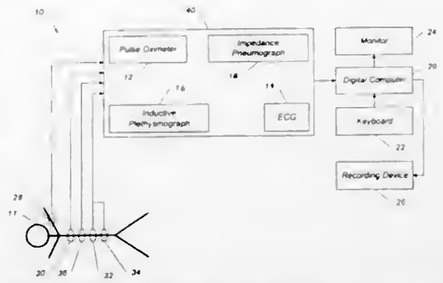
5,588,425

METHOD AND APPARATUS FOR DISCRIMINATING BETWEEN VALID AND ARTIFACTUAL PULSE WAVEFORMS IN PULSE OXIMETRY

Marvin A. Sackner, Miami Beach, and Dana M. Inman, Miami, both of Fla., assignors to Nims, Incorporated, Miami Beach, Fla.

Continuation of Ser. No. 66,593, May 21, 1993, abandoned. This application May 1, 1995, Ser. No. 431,469
Int. Cl.[6] G06F *15/42*
U.S. Cl. 128—632 **29 Claims**

1. A method for discriminating between artifactual and non-artifactual pulse waveforms generated by a pulse oximeter for



validating indicated arterial oxygen saturation levels of a subject also generated by the pulse oximeter, the pulse waveforms each being defined, at least partially, by a systolic upstroke time and a diastolic time, the method comprising:

selecting a predetermined range of a first parameter indicative of a correct pulse waveform, said first parameter being selected from the group consisting of systolic upstroke times and diastolic times;

receiving from the pulse oximeter, in a first receiving step, pulse waveforms;

receiving from the pulse oximeter, in a second receiving step, signals indicative of the arterial oxygen saturation level of the subject;

measuring said first parameter of the received pulse waveforms, wherein said measuring step comprises measuring the systolic upstroke times corresponding to received pulse waveforms;

comparing the measured systolic upstroke times to a predetermined range of, systolic upstroke times;

rejecting as artifactual any of the pulse waveforms having a systolic upstroke time outside said predetermined range of systolic upstroke times; and

determining the arterial oxygen saturation levels indicated by the received signals corresponding temporally to the non-rejected pulse waveforms.

5,588,426

Patent Not Issued For This Number

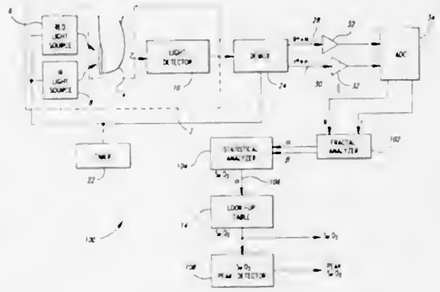
5,588,427

ENHANCEMENT OF PHYSIOLOGICAL SIGNALS USING FRACTAL ANALYSIS

Jonathan Tien, Redmond, Wash., assignor to SpaceLabs Medical, Inc., Redmond, Wash.

Filed Nov. 20, 1995, Ser. No. 559,846
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—633 **30 Claims**

11. A system for the enhancement of physiological signals



representative of a physiological phenomenon in a subject, the system comprising:

a sensor positioned in proximity with the subject to detect physiological signals and to generate signals indicative of said detected physiological signals, said detected signals having a first portion arising from the physiological phenomenon and a second portion arising frown an interference source;

an analyzer to analyze and determine a complexity value for said generated signals, said complexity value being indicative of a complexity of said generated signals; and

a processor, responsive to said complexity value, to generate a processed signal

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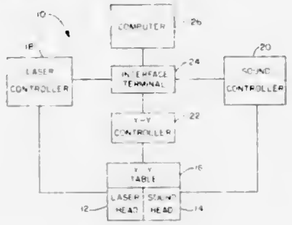
5,588,428

METHOD AND APPARATUS FOR NON-INVASIVE VOLUME AND TEXTURE ANALYSIS

Daniel J. Smith, Stow, and Shailesh Bhat, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Apr. 28, 1993, Ser. No. 54,797
Int. Cl.[6] G06F *159/00*, **A61B** *5/05;6/00*
U.S. Cl. 128—653.1 **19 Claims**



1. An apparatus to image a three dimensional surface for analysis of surface profile, volume or surface texture comprising:

a laser source for emitting a predetermined wavelength beam which is reflected off the surface being imaged,

a laser detecting means positioned relative to said laser source for receiving the reflected beam to generate a first signal corresponding to the amount of laser energy reflected off said surface, wherein said reflected beam is indicative of changes in the depth of said surface relative to said laser source,

a sound source having a frequency less than 1 MHz for generating a coherent beam of sound waves which are reflected off said surface, said sound source not being in physical contact with said surface,

a sound detecting means positioned relative to said sound source for receiving reflected sound waves to generate a second signal corresponding to the amount of sound waves reflected off said surface, wherein the reflected sound waves are indicative of at least the texture of said surface, and

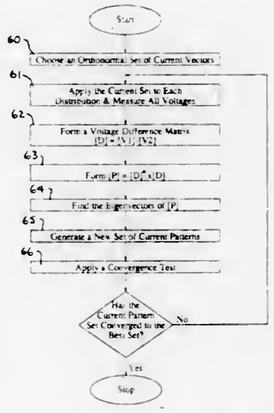
a process means to receive and independently process said first and second signals and to use said first and second signals to generate an image of said surface.

5,588,429

PROCESS FOR PRODUCING OPTIMAL CURRENT PATTERNS FOR ELECTRICAL IMPEDANCE TOMOGRAPHY

David Isaacson, Latham, and Margaret Cheney, Troy, both of N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 734,591, Jul. 23, 1991, Pat. No. 5,381,333, Ser. No. 727,075, Jul. 9, 1991, Pat. No. 5,390,110, and Ser. No. 132,457, Oct. 6, 1993, Pat. No. 5,544,662. This application Oct. 5, 1994, Ser. No. 317,678
Int. Cl.[6] A61B *5/05*
U.S. Cl. 128—734 **2 Claims**



1. In an electrical impedance tomography system that includes a body with an array of electrodes on its surface, means for injecting spatial patterns of current into the electrodes consecutively, subject to a limitation on the maximum current in any electrode, and means for measuring the real and reactive voltage components at all the electrodes, an improved method for finding the values of an unknown distribution of permittivities from which images may be formed, comprising.

(a) selecting an arbitrary guessed permittivity distribution and applying an arbitrary guessed set of current patterns to the electrodes to generate a voltage pattern on the array for each current pattern;

(b) measuring all electrode voltages for each current pattern applied which are in quadrature with the current pattern;

(c) calculating values of all theoretical voltages that should have appeared on the electrodes for the body due to the arbitrary set of guessed current patterns and the arbitrary guessed permittivity distribution;

(d) calculating a new set of current patterns based on differences between the measured and calculated voltage values;

(e) calculating the differences between electrode currents of the arbitrary set of current patterns and the calculated new set of current patterns, to form current differences;

(f) if any of the current differences are greater than a selected tolerance, applying the new set of current patterns to the electrode array and repeating steps (b) to (e);

(g) when the current differences are smaller than the selected tolerance, testing whether any of the voltage differences between the measured and calculated values at the electrodes, using the last set of current patterns, are larger than a predetermined value;

(h) if so, computing a new permittivity distribution as a function of the new set of current patterns and the measured voltage values;

(i) repeating steps (b) through (f) using the new permittivity distribution to replace the previously assumed distribution in order to find a set of current patterns that better distinguishes the actual permittivity distribution from the new one; and

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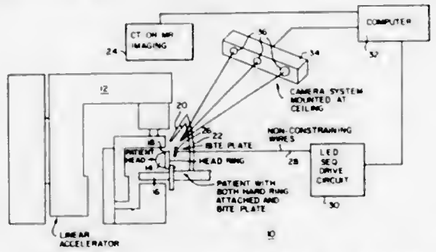
(j) repeating steps (g) through (i) as many times as are necessary to produce a calculated permittivity distribution whose calculated voltages are substantially identical to those measured.

5,588,430

REPEAT FIXATION FOR FRAMELESS STEREOTACTIC PROCEDURE

Frank J. Bova, and William A. Friedman, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Filed Feb. 14, 1995, Ser. No. 388,024
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—653.1 **12 Claims**



1. A medical method comprising the steps, not necessarily in order, of:

positioning a patient for a first medical procedure;

attaching a mechanically free locator to the patient, the locator having at least 3 LEDs thereon and being in registry with a portion of the patient;

using the LEDs a first time to get precise positioning information relative to at least part of the patient;

performing a first medical procedure on the patient;

after the first medical procedure, removing the locator from the patient;

at a later time after the removing of the locator, re-attaching the locator to the patient, the locator again being in registry with the portion of the patient and having an identical orientation relative to the portion of the patient as when the locator was previously attached;

after the re-attaching step, using the LEDs a second time to get precise positioning information relative to the at least part of the patient; and

after the re-attaching step, performing a second medical procedure on the patient and

wherein the attaching and re-attaching of the locator is non-invasive and wherein the locator is a bite plate with an external portion connected thereto, and the LEDs are on the external portion, and wherein the attaching includes using a mold of dental impression material to bring the bite plate in registry with teeth of the patient, and wherein the re-attaching uses the mold to bring the bite plate in registry with teeth of the patient with an identical orientation relative to the teeth as when the bite plate was previously attached.

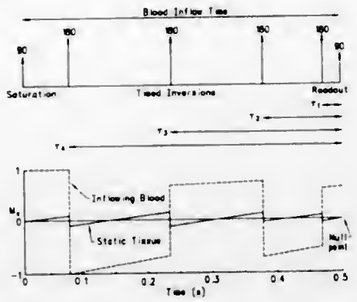
5,588,431

INVERSION RECOVERY MRI

Sanjay Mani; Dwight G. Nishimura, both of Palo Alto; Steven M. Conolly, Menlo Park, and John M. Pauly, San Francisco, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Aug. 17, 1995, Ser. No. 516,243
Int. Cl.[6] A61B *5/055*
U.S. Cl. 128—653.3 **12 Claims**

1. A method of multiple inversion recovery imaging signal detection comprising the steps of



a) placing an object to be imaged in a magnetic field,

b) applying RF excitation to saturate static nuclei spins,

c) applying at least four spin inversion pulses to null nuclei in static material having different spin-lattice relaxation times (T_1); and

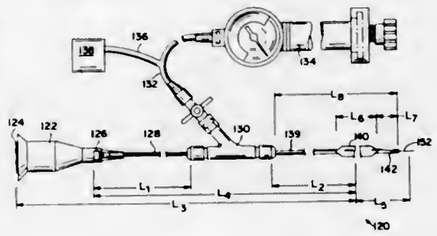
d) applying at least one read-out pulse and detecting emitted magnetic resonance signals.

5,588,432

CATHETERS FOR IMAGING, SENSING ELECTRICAL POTENTIALS, AND ABLATING TISSUE

Robert J. Crowley, Wayland, Mass., assignor to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 86,523, Jul. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 988,322, Dec. 9, 1992, Pat. No. 5,372,138, which is a continuation of Ser. No. 570,319, Aug. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 171,039, Mar. 21, 1988, Pat. No. 4,951,677. This application Jul. 10, 1995, Ser. No. 500,115
Int. Cl.[6] A61B *8/12*
U.S. Cl. 128—660.03 **31 Claims**



1. An acoustic imaging system for use within a body of a living being, comprising:

an elongated, flexible catheter constructed to be inserted into said body of said living being,

an ultrasound device movable within said elongated, flexible catheter,

a chemical ablation device mounted on a distal portion of said elongated, flexible catheter, and

a plurality of electrical conductors extending from a proximal portion of said elongated, flexible catheter to said distal portion, at least two of said plurality of electrical conductors being connected to said ultrasound device,

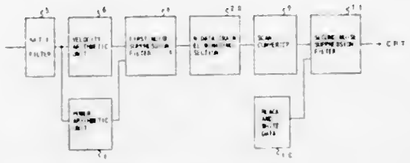
said ultrasound device being arranged to direct ultrasonic signals toward an internal structure within said body of said living being for the purpose of creating an ultrasonic image of said internal structure, and said chemical ablation device being arranged to ablate at least a portion of said internal structure imaged by said ultrasound device by delivery of fluid to said internal structure, said chemical ablation device being arranged to cause ablation solely by fluid delivery only.

5,588,433

ULTRASONIC DIAGNOSTIC APPARATUS

Takeshi Shirai, and Wataru Yagi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 12, 1995, Ser. No. 571,103
Claims priority, application Japan, Apr. 18, 1995, 7-092656
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.05 **16 Claims**



1. An ultrasonic diagnostic apparatus in which ultrasonic waves are transmitted and received in directions each along the associated one of a plurality of scan lines extending in a depth direction within the subject to obtain received signals, and data representative of displacement of respective pixel points along each scan line within the subject are evaluated on the basis of the thus obtained received signals, thereby displaying an image based on the data representative of the displacement, the ultrasonic diagnostic apparatus comprising:

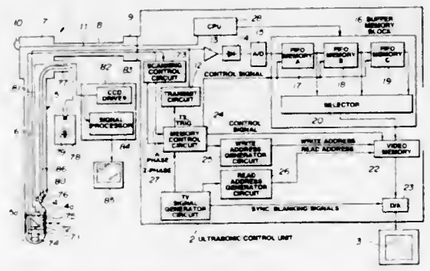
N data train eliminating means for performing such a data replacement arithmetic operation that with respect to a pixel train wherein pixels of which data are representative of the presence of displacement appear continuously within N pixels in a predetermined direction, where N is a positive integer, data involved in the pixels constituting of said pixel train are replaced by data representative of the absence of the displacement.

5,588,434

ULTRASONIC DIAGNOSTIC APPARATUS PRESENTING CLOSELY CORRELATED ULTRASONIC IMAGE

Hiroshi Fujimoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1995, Ser. No. 537,281
Claims priority, application Japan, Oct. 3, 1994, 6-239247; Sep. 20, 1995, 7-241958
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.07 **29 Claims**



1. An ultrasonic diagnosing apparatus comprising:

ultrasonic generator means including an ultrasonic transducer for feeding a driving signal to said ultrasonic transducer to generate ultrasonic wave;

scanning means for causing the ultrasonic wave generated by said ultrasonic transducer to scan a predetermined scanning region for a predetermined scanning duration;

video data memory means for storing returned signals, which are received and electro-acoustically converted by said ultrasonic transducer, in a plurality of video frames of video data obtained over a plurality of predetermined scanning durations, video frame by video frame, each video frame corresponding to said scanning region;

video distortion detector means for detecting the degree of distortion in the video in each of said video frames stored in said video data memory means;

video selector control means for performing selection control so that said video data memory means outputs selectively the video of a video frame that is found to suffer less degree of distortion based on said degree of distortion detected by said video distortion detector means; and

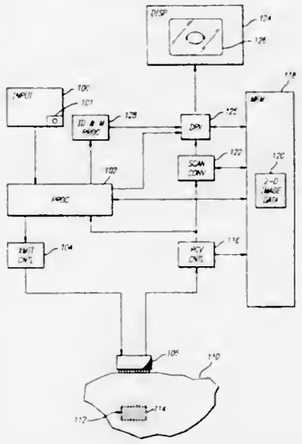
video display means for presenting said video of said video frame selected by said video selector control means.

5,588,435

SYSTEM AND METHOD FOR AUTOMATIC MEASUREMENT OF BODY STRUCTURES

Lee Weng, Issaquah, and Wayne Gueck, Redmond, both of Wash., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Nov. 22, 1995, Ser. No. 561,759
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.07 **8 Claims**



1. A method for measuring human body structures using ultrasound comprising the following steps:

generating and displaying an image frame as a pattern of pixels, each pixel having a brightness value corresponding to an echo signal from a corresponding portion of an interrogation region of the human's body, which includes the body structure, the image frame including a structure frame portion corresponding to the body structure;

designating a general geometry feature of the displayed body structure and at least one measurement parameter associated with the designated geometry feature;

selecting at most two reference points associated with the displayed body structure;

filtering the displayed image to identify the structure frame portion;

generating an approximating function corresponding to the designated measurement parameter; and

calculating each measurement parameter as a predetermined function of the approximating function.

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5,588,436

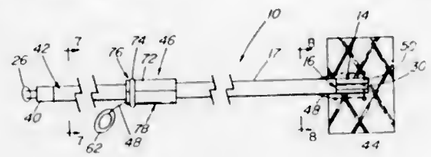
PULSED DOPPLER PROBE

Krishna Narayanan, Pittsburgh; Vasant Padmanabhan, Monroeville; Fredrick J. Shipko, Spring Church; Louis Goode, Evans City, all of Pa., and Neal E. Fearnot, West Lafayette, Ind., assignors to Cook Pacemaker Corporation, Leechburg, Pa., and MED Institute, West Lafayette, Ind.

Filed Oct. 11, 1995, Ser. No. 540,852

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—662.03 **20 Claims**



1. A pulsed Doppler probe (**10**) for monitoring blood flow within a blood vessel (**12**), comprising:

a plurality of longitudinally extending electrically conductive wires (**26**) having distal ends (**28**);

an ultrasonic transducer (**18**) operatively connected to the distal ends (**28**) of the wires (**26**), the transducer (**18**) having an operative surface (**20**);

means (**22**) having a longitudinal axis (**38**) and fixing the orientation of the operative surface (**20**) of the ultrasonic transducer (**18**) with respect to at least one of the longitudinally extending electrically conductive wires and, the longitudinal axis (**38**)

a band (**44**) adapted to encircle the blood vessel (**12**); and

remotely operable means (**46**) for detachably securing the orientation fixing means (**22**) to the band (**44**) so that the ultrasonic transducer (**18**) is positioned adjacent to the blood vessel (**12**);

whereby remote operation of the securing means (**46**) permits withdrawal of the ultrasonic transducer (**18**), wires (**26**) and orientation fixing means (**22**) from the blood vessel (**12**) while leaving the band (**44**) encircled about the blood vessel (**12**).

5,588,437

BLOOD FLOW DETERMINATION

Phillip O. Byrne, and Timothy J. H. Essex, both of Newcastle Upon Tyne, England, assignors to British Technology Group Limited, London, England

Continuation of Ser. No. 768,862, Sep. 27, 1991, abandoned. This application Feb. 16, 1994, Ser. No. 197,442

Claims priority, application United Kingdom, Mar. 29, 1989, 8907101

Int. Cl.[6] A61B *5/02*

U.S. Cl. 128—691 **19 Claims**

1. A method of determination of blood flow to produce a map of said blood flow, said method comprising the steps of:

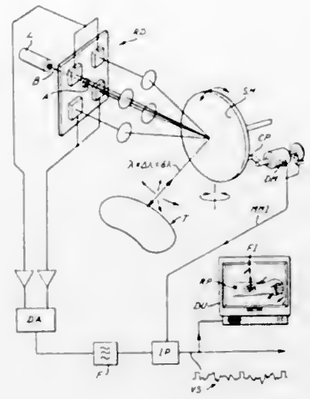
scanning a rod of laser light in two directions over an area of a surface beneath which area of the surface blood flow in a vessel or vascular bed is to be determined,

collecting light returning from the rod of light scattered by the surface and by blood flowing beneath the surface,

measuring a spectrum of frequencies in said collected light,

determining, from differences in said frequencies in said spectrum, blood flow in a vessel or vascular bed beneath said surface, and

producing from said determined blood flow the map of blood flow for a given area of said surface.



5,588,438

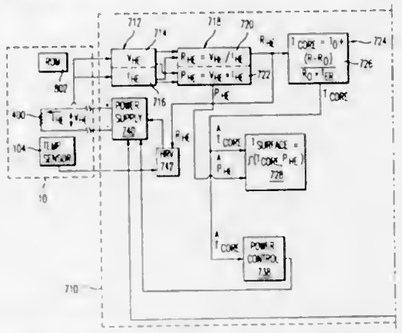
SYSTEM AND METHOD FOR CONTROLLING THE TEMPERATURE OF A CATHETER-MOUNTED HEATER

Russell C. McKown, Dallas; Michael D. Quinn, and Mark L. Yelderman, both of Plano, all of Tex., assignors to Interflo Medical, Inc., Plano, Tex.

Division of Ser. No. 334,443, Nov. 4, 1994, which is a continuation of Ser. No. 833,013, Feb. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,578, Jan. 29, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 473,738

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—692 **16 Claims**



1. A heater resistance verification system, comprising:

(i) means for measuring, in vivo, a temperature of blood when the blood is in contact with a thermodilution catheter;

(ii) a power supply for supplying electric power to an electric resistance-type heater element;

(iii) a power monitor for monitoring an amount of electric power that is supplied to the electric resistance-type heater element by the power supply;

(iv) a resistance monitor for monitoring an electrical resistance of the electric resistance-type heater element; and

(v) control means in communication with the means for measuring, the power supply, the power monitor, and the resistance monitor, for:

(a) empirically determining a relationship between the amount of electric power supplied and the electrical resistance of the electric resistance-type heater element under in vivo conditions;

(b) using the empirically determined relationship to estimate what electrical resistance the electric resistance-type heater element would have at a reference temperature;

(c) comparing the estimated resistance of the electric resistance-type heater element at the reference temperature with a known resistance of the electric resistance-type heater element at the reference temperature; and

(d) determining whether the difference between the estimated resistance and the known resistance of the electric resistance-type heater element exceeds a predetermined maximum.

5,588,439

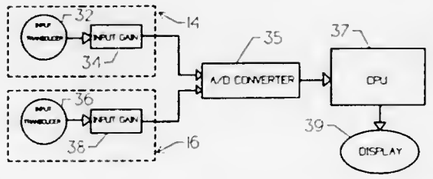
ACOUSTIC IMPULSE RESPIROMETER AND METHOD

Seth D. Holluh, Overland Park, Kans., assignor to Nellcor Incorporated, Pleasanton, Calif.

Filed Jan. 10, 1995, Ser. No. 370,623

Int. Cl.[6] A61B *5/08*

U.S. Cl. 128—721 **15 Claims**



1. A detector for measuring motion of a patient's body during respiration, comprising:

an acoustic impulse generator adapted to be disposed at a first position on the patient's body;

an acoustic impulse receiver adapted to be disposed at a second position on the patient's body, being disposed in spaced relationship to the acoustic impulse generator to detect impulses therefrom upon passage of the impulses through the patient's body; and

means for determining changes in a spaced relationship distance between the acoustic impulse generator and the acoustic impulse receiver induced by the patient's respiration.

5,588,440

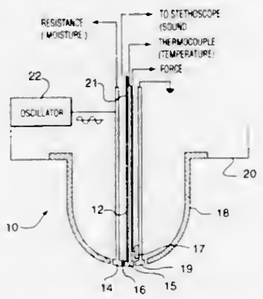
METHOD AND APPARATUS FOR LOCATING AND ASSESSING SOFT TISSUE LESIONS

Jocelyn W. Cowie, P.O. Box 1495, 6700 Danshin Village Road, Grand Forks, B.C., Canada

Filed Aug. 10, 1995, Ser. No. 513,406

Int. Cl.[6] A61B *5/05*

U.S. Cl. 128—734 **8 Claims**



1. Apparatus for diagnosing the skin condition of a human being or animal, comprising a probe for contacting a desired area of skin, said probe having

(a) means for measuring the moisture content of the skin at said area; and

(b) means for measuring the sound generated by the skin tissue in said area;

wherein said means for measuring the moisture content and said means for measuring sound indicate the presence of skin lesion when the moisture content and the sound reading are both abnormally high.

5,588,441

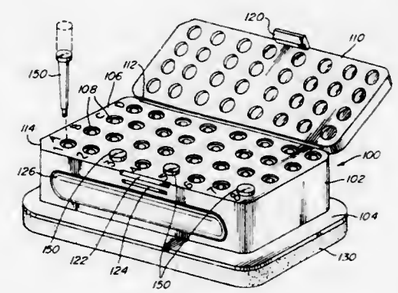
ALLERGY TESTING APPARATUS WITH VARIABLY SPACED TEST USING SITES

Henry Fishman, 5173 Linnean Ter. NW., Washington, D.C. 20008

Continuation of Ser. No. 13,679, Feb. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 931,202, Aug. 17, 1992, Pat. No. 5,335,670, which is a continuation of Ser. No. 685,626, Apr. 15, 1991, Pat. No. 5,154,181, which is a continuation of Ser. No. 501,376, Mar. 29, 1990, Pat. No. 5,027,826, which is a continuation of Ser. No. 339,863, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 204,967, May 31, 1988, abandoned, which is a continuation of Ser. No. 88,139, Aug. 21, 1987, abandoned, which is a continuation of Ser. No. 853,710, Apr. 18, 1986, Pat. No. 4,711,247. This application Jun. 7, 1995, Ser. No. 479,791

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—743 **39 Claims**



1. An allergy testing apparatus for testing a patient for a plurality of substances, comprising:

a first member having a plurality of engaging means arranged at respective positions on said first member for selectively engaging a respective pricking or piercing element;

a plurality of pricking or piercing elements which are selectively engaged with selected engaging means of said first member, at selected positions on said first member, said pricking or piercing elements extending in a given direction from said first member for pricking or piercing the skin of a patient in use;

said first member having a side wall extending in said given direction so as to at least partly surround said pricking or piercing elements, said side wall having a free end portion for placement against the skin of a patient;

said side wall of said first member including a resilient compressible portion for controlling a downward movement distance of said pricking or piercing elements which are engaged with said first member;

a well tray having a plurality of receptacles for receiving substances for which a patient is to be tested at selected receptacles corresponding in position to the pricking or piercing elements which are engaged with said selected engaging means at said selected positions of said first member, said first member with said pricking or piercing elements engaged thereon, being engageable with said well tray for causing the pricking or piercing elements mounted to said first member to contact said substances in respective associated receptacles, said first member being thereafter removable from said well tray for application of said substances to a patient;

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said removed first member then being adapted to be placed with said free ends of said side walls thereof against the skin of a patient and to be pressed downwardly against the skin of the patient to compress said compressible portion and to cause said pricking or piercing elements to contact the skin of the patient and to apply said substances at respective spaced apart positions on the skin of the patient, the respective spaced apart positions on the skin of the patient being spaced apart a distance corresponding to the positions at which the pricking or piercing elements are engaged with said first member.

5,588,442

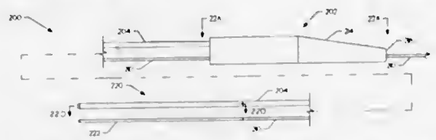
SHAFT MOVEMENT CONTROL APPARATUS AND METHOD

Brian Scovil, New Hope; Todd A. Berg, Lino Lakes; Kevin Klitz, Plymouth; Thomas J. Bachinski, Lakeville; John W. Humphrey, Eden Prairie; Scott Thome, Waite Park, and Roger Hastings, Maple Grove, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation-in-part of Ser. No. 48,492, Apr. 16, 1993, Pat. No. 5,555,893, which is a continuation-in-part of Ser. No. 929,083, Aug. 12, 1992. This application Mar. 2, 1995, Ser. No. 397,578

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—772 **36 Claims**



1. A device for use in exchanging a first guide catheter for a second guide catheter, the device comprising:

a. a support member insertable within the first guide catheter, having a proximal end and a distal end; and

b. means for coupling responsive to a magnetic source, carried by the support member, wherein the means for coupling maintains the support member stationary relative to a guide wire while exchanging the first guide catheter for the second guide catheter.

5,588,443

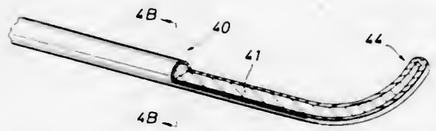
ZIRCONIUM OXIDE AND ZIRCONIUM NITRIDE COATED GUIDE WIRES

James A. Davidson, Germantown, Tenn., assignor to Smith & Nephew Richards, Inc., Memphis, Tenn.

Division of Ser. No. 112,587, Aug. 26, 1993, Pat. No. 5,496,359, which is a continuation-in-part of Ser. No. 919,932, Jul. 27, 1992, Pat. No. 5,282,850, which is a continuation-in-part of Ser. No. 830,720, Feb. 4, 1992, Pat. No. 5,258,022, which is a continuation-in-part of Ser. No. 557,173, Jul. 23, 1990, Pat. No. 5,152,794, which is a continuation-in-part of Ser. No. 385,285, Jul. 25, 1989, Pat. No. 5,037,438. This application Jun. 6, 1995, Ser. No. 467,164

Int. Cl.[6] A61M *25/09*

U.S. Cl. 128—772 **12 Claims**



1. A flexible guide wire for insertion into a living body, the guide wire comprising:

(a) an elongate core having a distal end for insertion into a living body, a proximal end and surfaces, said core comprising a low elastic modulus metallic composition; and

(b) a corrosion-resistant, biocompatible, hemocompatible, durable, stable coating selected from the group consisting of zirconium oxides, ranging in color from blue to black, and zirconium nitrides, ranging in color from yellow to orange, said coating disposed on the surfaces of the distal end of the core.

5,588,444

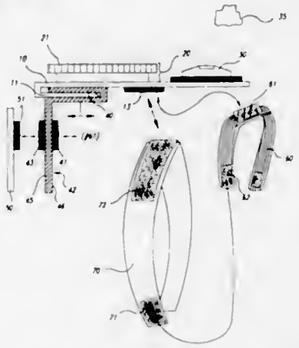
HUMAN RANGE OF MOTION MEASUREMENT SYSTEM

Michael R. Petragallo, 10003 NE. 123rd, Kirkland, Wash. 98034

Continuation-in-part of Ser. No. 978,587, Nov. 19, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,995

Int. Cl.[6] A61B *5/103*

U.S. Cl. 128—782 **8 Claims**



1. A modular ROM measurement system comprising:

a transometer having a horizontal support surface on which are mounted a magnetic north seeking means, a leveling means for measurement in a transverse plane, and, releasably attached to the horizontal support surface, at least one additional modular component selected from the group of components consisting of an inclinometer for determining a degree of inclination of the horizontal support surface from the horizontal, a headband, a stabilizer plate, one or more elastic bands, one or more vertical mode plates selected from a group of plates consisting of a thoras plate and an extremity plate, one or more soft level adjusting means;

whereby each of the modular components from the above said group of components may be releasably and temporarily interengaged with one another and the horizontal support surface of the transometer, so that

a plurality of separate instrument configurations may each be temporarily assembled for performing a specific ROM measurement function, and then be disassembled for compact storage or for reassembly into the same or different instrument configurations.

5,588,445

HEAD AND NECK PROTECTOR FOR CHILDREN

Hemayatullah S. Ohaidi, 905 University Village Dr., Richardson, Tex. 75081

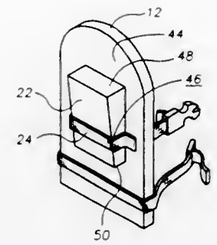
Filed May 22, 1996, Ser. No. 651,776

Int. Cl.[6] A61F *5/37*

U.S. Cl. 128—846 **20 Claims**

1. A head and neck protector comprising:

a flexible resilient back member sized to cover the back shoulders and head of a child having a substantially smooth child



contacting surface and constructed from a flexible mesh member surrounded by resilient foam and covered with a fabric covering;

an adjustable torso strap assembly secured to said resilient back member including first and second adjustable length torso straps securable about said torso of a child;

first and second adjustable shoulder straps secured to said child contacting surface, each of said first and second shoulder straps having a securing mechanism on a distal end thereof for securing said shoulder strap to one of said first and second torso straps;

a removable sloped cushion member; and

a cushion retaining strap attached to said back member and forming a cushion retaining loop into which said sloped cushion member is inserted and held.

5,588,446

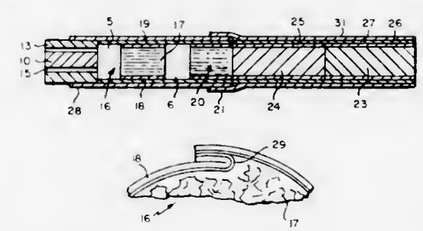
CIGARETTE WITH IMPROVED CELLULOSIC SUBSTRATE

Jack F. Clearman, Blakely, Ga., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 71,132, Jun. 2, 1993. This application Sep. 13, 1994, Ser. No. 305,405

Int. Cl.[6] A24F *1/22;47/00*

U.S. Cl. 131—194 **9 Claims**



1. A smoking article comprising:

(a) a combustible fuel element less than about 30 mm in length prior to smoking, and

(b) a physically separate aerosol generating means disposed longitudinally behind the fuel element comprising a cellulosic substrate material bearing an amount of aerosol forming material sufficient to substantially eliminate the burning of the substrate under smoking conditions of 50 ml volume per puff of 2 seconds duration, followed by 28 seconds of smolder, the substrate material being positioned in a barrier tube formed from a paper/foil laminated web having an isolating joint by which the substrate is isolated from contact with the paper layer of the paper/foil laminated web.

5,588,447

BRUSH FOR APPLYING NAIL VARNISH AND METHOD

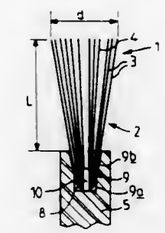
Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Nov. 7, 1994, Ser. No. 337,223

Claims priority, application France, Nov. 5, 1993, 93 13214

Int. Cl.[6] A45D *34/04;* **A46B** *3/16*

U.S. Cl. 132—200 **30 Claims**



1. Brush for the application of varnishes, comprising bristles forming a tuft obtained from a bundle of bristles which are substantially parallel and folded in two approximately halfway along their length, the folded part being fixed in a housing opening at an end of a rod, the bristles having cross-sections which are bounded by a circle of constant diameter, wherein the bristles of the tuft comprise at least two groups, the bristles of one group being arranged to have a different mechanical behavior in flexure from that of the bristles of another group so that these groups give a brush tuft which is open to the air and spread out with relatively large spaces between adjacent bristles, to promote good capillary action for varnishes whose viscosity may vary over a wide range.

5,588,448

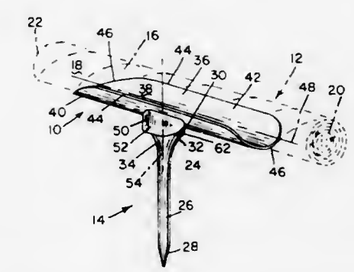
SMOKING ARTICLE HOLDER

John G. Photakis, 53 Winifred Ave., Worcester, Mass. 01602

Filed Jun. 6, 1995, Ser. No. 470,913

Int. Cl.[6] A24F *13/12*

U.S. Cl. 131—259 **8 Claims**



1. A smoking article holder, for use with a golf tee having a head portion, and for use with a smoking article, said holder comprising:

(a) a generally oblong upper member having an elongated, concave upper surface and a lower surface, said upper surface being adapted for receiving at least a part of the smoking article, and

(b) a lower member, depending from said lower surface of said upper member, intermediate the length thereof, said lower member being adapted to receive at least a part of the head portion of the golf tee.

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5,588,449

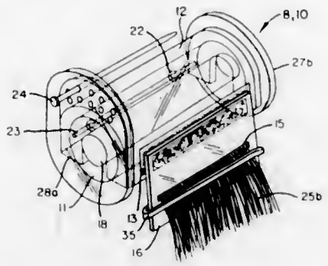
HAIR ROLLER APPARATUS AND METHOD FOR HIGHLIGHTING HAIR

William C. Falcon, 192 E. International Speedway Blvd., Daytona Beach, Fla. 32118

Continuation-in-part of Ser. No. 209,973, Mar. 15, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 475,535

Int. Cl.[6] A61K *7/13*; A45D *6/16*

U.S. Cl. 132—208 20 Claims



1. A hair roller apparatus comprising:

an elongated roller stem having first and second opposing ends;

a first end flange mounted to said first end of said elongated roller stem;

an elongated cap member removably and rotatably mounted to said elongated roller stem in covering relation to said elongated roller stem;

wherein said elongated cap member includes an elongated cap body having first and second ends, and a first end wall mounted to said first end of said elongated cap body;

wherein said first end wall of said elongated cap member includes an engagement portion;

wherein said first end flange includes an engagement portion which is selectively and disengageably securable to said engagement portion of said first end wall;

wherein a second end flange is mounted to said second end of said elongated roller stem;

wherein said second end flange is circular and projects radially outwardly from said elongated roller stem;

wherein said first end flange is oblong and projects radially outwardly from said elongated roller stem; and

wherein said first end wall of said elongated cap member protrudes outwardly beyond said elongated cap body in a direction perpendicular to a longitudinal direction of said elongated cap body.

5,588,450

BRUSH FOR APPLYING A MAKE-UP PRODUCT, PARTICULARLY MASCARA

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

PCT No. PCT/FR94/00729, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO95/00050, PCT Pub. Date Jan. 5, 1995

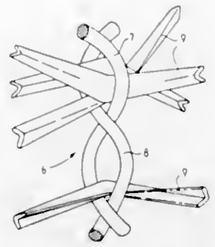
PCT Filed Jun. 17, 1994, Ser. No. 387,802

Claims priority, application France, Jun. 23, 1993, 93 07609

Int. Cl.[6] A45D *40/26*

U.S. Cl. 132—218 2 Claims

1. Brush for applying a make-up product, comprising a wand equipped at one end with a core formed by two branches made from metal wire which are twisted into turns between which bristles extending transversely with respect to the core are trapped, wherein at least a fraction of the bristles of the brush has a transverse section in the shape of an L so that a zone of a bristle wedged between the turns of the core undergoes a flattening by the effect of one of unfolding when an angle between the branches of the L opens, and folding when the angle between the branches of the L closes, said flattening reducing the rigidity of the bristle and



increasing the spacing between the bristle and a helical ply formed after twisting, thereby creating a disorganized arrangement of the section of the bristles, said bristles having a transverse section in the shape of an L being mixed with harder bristles so as to form an assembly, and said assembly being ground in order to obtain bristles having a transverse section in the shape of an L and whose ends are located beyond those of the harder bristles made shorter by grinding.

5,588,451

HAIR RETAINER

Helen A. Peters, 2992 Paradise Dr., West Bend, Wis. 53095

Filed May 2, 1995, Ser. No. 434,206

Int. Cl.[6] A45D *8/04;8/34;8/36*

U.S. Cl. 132—273 15 Claims

1. A retainer for retaining a flock of hair, the retainer comprising:

at least one elongate rigid member having a pointed leading end and a following end; and

at least one protuberance extending radially outwardly from the member, the protuberance is defined by at least a leading surface and a following surface, the leading surface located relatively closer to the leading end than the following surface, the leading surface having first proximal and first distal ends, the first proximal end located relatively closer to the leading end than the first distal end, the leading surface sloping radially outwardly from the first proximal end to the first distal end so as to form a first angle between the leading surface and a first line tangent to a portion of the member adjacent the leading surface, the following surface having second proximal and second distal ends, the following surface sloping radially inwardly from the second distal end to the second proximal end so as to form a second angle between the following surface and a second line tangent to a portion of the member adjacent the following surface, the first angle is of an obtuse degree and the second angle is of a lesser degree than the first.

5,588,452

TOOTH CLEANSING AND FLOSSING IMPLEMENT AND METHOD

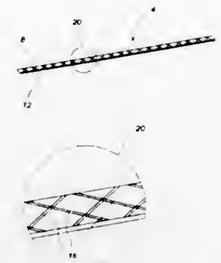
Granger Peck, 6 Legend La., Sandy, Utah 84115

Filed May 10, 1995, Ser. No. 438,258

Int. Cl.[6] A61C *15/00*

U.S. Cl. 132—321 13 Claims

1. A unitary tooth cleansing implement comprising an elongate, slender shaft having generally planar upper and lower surfaces, with a thickness of from about 0.4 millimeters to 0.8 millimeters



and a width of from about 0.5 millimeters to 2.5 millimeters, the upper and lower surfaces being roughened, said shaft being constructed of polymer material and being longitudinally stiff and laterally flexible.

5,588,453

MANICURE DEVICE

Mary A. Fraysher, 660 Springhill Dr., Hurst, Tex. 76054

Filed Jul. 13, 1995, Ser. No. 502,123

Int. Cl.[6] A45D *29/18*

U.S. Cl. 132—76.4 6 Claims

1. A manicuring device for use in honing a nail of a user having an inner surface, the device comprising:

an elongated cylindrical body having an outer surface and a first tapered end and a second end distal from the first tapered end;

an abrasive surface affixed to the outer surface of the body proximate the second end; and

the abrasive surface and the body comprising a perforation line comprising perforations passing through the abrasive surface and partially into the body, the perforation line surrounding the cylindrical body at a constant distance from the second end of the body such that the user of the device may use the abrasive surface to hone the inner surface of the user's nail and may fracture the abrasive surface and the body at the perforation line to allow for the use of a portion of the abrasive surface proximate the perforation line.

5,588,454

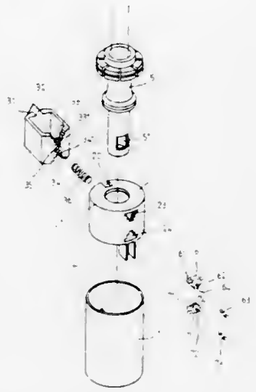
DUAL LOCKING MECHANISM FOR USE IN UMBRELLA HANDLES

Chin S. Kou, No. 27-1, Lane 188, Chin Mar Road, Sec. 3, Chang Hua, Taiwan

Filed Feb. 5, 1996, Ser. No. 596,625

Int. Cl.[6] A45B *25/14*

U.S. Cl. 135—24 1 Claim



1. A dual locking mechanism of an umbrella handle, said handle being attached to the lower end of an umbrella rod, with a runner slidably embracing the outer surface of the rod, comprising:

a base and a transversely movable button disposed inside said umbrella handle, the base being provided with an opening;

said handle having a hole on its side surface and said base having an opening disposed at a corresponding position thereof and a slot formed on a top portion of said base above the opening, thereby allowing the button to be placed into the base;

said button having a raised portion on side thereof piercing through said opening of the handle with a top portion of the raised portion engaging with the slot of the base;

said button being further provided symmetrically with an upper stepped groove and a lower stepped groove on a side of said button opposite to the side thereof containing the raised portion, both grooves having a recessed portion respectively formed on bottom portions thereof, said button having a cavity formed between said grooves for accommodating a spring,

the base being provided an upper guide groove and a lower guide groove formed in positions respectively corresponding to the upper and the lower stepped grooves of the button;

an upper and a lower locking element being respectively situated in the guide grooves, and each locking element comprising one wedged end and an opposing end provided with a stub on which a spring is mounted to furnish the locking element a resilient force toward the center of the base;

said upper locking element and said lower locking element having, respectively on a bottom surface of the upper locking element and a top surface of the lower locking element, a raised block that engages with said stepped grooves of the button;

said dual locking mechanism holding the umbrella's runner in an upper position in a normal operation of closing the umbrella and fixing it in a lower position if further shortening is needed and releasing the runner by pressing said button.

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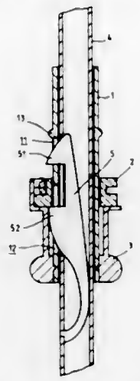
5,588,455

SECURING RUNNER OF AN UMBRELLA

Cheng M. L. Kuo, No. 18, Alley 15, Lane 582, Sea Ta Road, Hsinchu, Taiwan

Filed May 14, 1996, Ser. No. 645,815
Int. Cl.[6] A45B *25/06*
U.S. Cl. 135—28 **1 Claim**



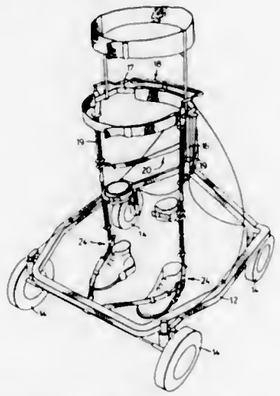
1. A securing runner of an umbrella including a sleeve, a nest portion, and a base; wherein the sleeve has an upper groove and a lower groove on one side related to a curved end and a holding end of a detent positioned in a main tube of the umbrella; the nest portion connecting with stretchers of the umbrella and the base being provided around the sleeve that the base has an inner circular rim to fit into a circular groove provided on lower part of the sleeve to obtain a good engagement between both; and while the runner being pull downward, the sleeve urges the detent spring moving inwardly directly and the runner can be slid down to close the umbrella.

5,588,456

ORTHOTIC WALKER

David Hart, Keighley, England, assignor to Ontario Crippled Children's Centre, Toronto, Canada

Division of Ser. No. 330,832, Oct. 27, 1994. This application Jul. 12, 1995, Ser. No. 501,683
Claims priority, application Canada, Nov. 2, 1994, 2115528
Int. Cl.[6] A61H *3/00*
U.S. Cl. 135—67 **5 Claims**



1. A walking support orthosis comprising:

a wheeled frame;

a support member for a body brace, the support member being located to extend at least partially behind the body of a user;

a body brace including leg braces, and having support engagement means to engage said support member, the engagement means being located on a rear part of the body brace, and the leg braces having generally hip level connections to the support member to allow for articulation of a hip joint of a user;

each leg brace including:

a stirrup for supporting the foot of a user, the stirrup means comprising a generally horizontal support bar located to lie under the instep of the foot of a user and a stirrup leg fixed to the support bar at one leg end extending rearwardly upwardly from the support bar to a pivotal connection with a lower end of a shank member of the leg brace;

a stop being provided to limit pivotal travel of the stirrup leg to inhibit swivelling of the support bar; and

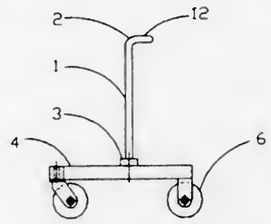
a clamp being provided to clamp a shoe of the user to be fixed against swivelling on the support bar.

5,588,457

ROLLER CANE TO AID THE HANDICAPPED PERSON IN WALKING AND IN MANEUVERING

John A. Tartaglia, 108 Stoddard Rd., Waterbury, Conn. 06708

Filed Nov. 17, 1994, Ser. No. 341,639
Int. Cl.[6] A61H *3/02*
U.S. Cl. 135—85 **3 Claims**



1. A cane assembly comprising a cylindrical tube, a curved handle, and a base bracket, wherein the tube has an upper and lower end, said handle extending from said upper end, said base bracket being attached to said lower end at approximately a mid-point of said bracket, said bracket having a front and rear end, wherein two front swivel wheels are attached to the front end and two fixed rear wheels are attached to said rear end.

5,588,458

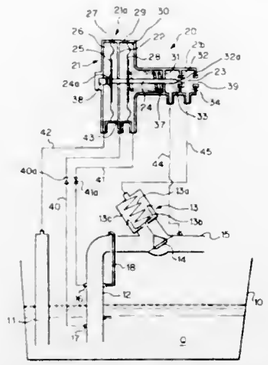
VACUUM VALVE CONTROLLER FOR VACUUM SEWER SYSTEM

Akihiro Ushitora, and Osamu Shimizu, both of Kanagawa-ken, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Apr. 6, 1995, Ser. No. 417,764
Claims priority, application Japan, Apr. 19, 1994, 6-104587; Feb. 2, 1995, 7-039362
Int. Cl.[6] E03C *1/12*
U.S. Cl. 137—205 **11 Claims**

1. A vacuum valve controller for a vacuum sewer system having a suction pipe which is communicated with a vacuum system by opening a vacuum valve, and which is cut off from the vacuum system by closing said vacuum valve so that soil water in a soil water basin is sucked through said suction pipe and sent to a predetermined place by opening said vacuum valve, said vacuum valve controller comprising:

means for detecting that said suction pipe begins to suck air from a lower end thereof when the soil water level has fallen as a result of suction of soil water through said suction pipe; and



control means for closing said vacuum valve when said detecting means detects that said suction pipe has begun to suck air,

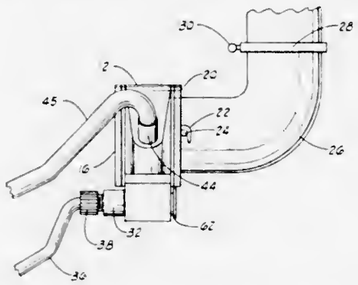
wherein said detecting means detects that said suction pipe begins to suck air from a change of pressure difference between two points in said suction pipe which are different in height from each other.

5,588,459

DEVICE FOR FACILITATING REMOVAL OF WASTEWATER AND SEWAGE FROM A RECREATIONAL VEHICLE

Mark E. Ellis, P.O. Box 214, Kaw City, Okla. 74641

Filed Nov. 16, 1995, Ser. No. 558,715
Int. Cl.[6] B08B *3/04;9/06;* **F16L** *45/00*
U.S. Cl. 137—239 **8 Claims**



1. A sewage removal device for use with an RV and the like comprising:

(a) a housing having an interior cavity and connecting means for attaching said device to a sewage drain conduit on said RV;

(b) a first opening in said device providing fluid communication between said sewage drain conduit and said interior cavity when said device is attached to said sewage drain conduit;

(c) a fluid outlet conduit extending from the lower portion of said cavity to the exterior of said housing: and

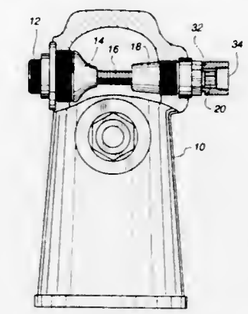
(d) a fluid inlet conduit extending from the exterior of said housing and into an interior portion of said housing, said inlet conduit including a nozzle extending from a discharge end thereof and into said cavity in coaxial alignment with said outlet conduit, said nozzle being adapted to discharge a liquid jet stream into the interior of said housing toward said fluid outlet conduit and in alignment with the longitudinal axis of said fluid outlet conduit, whereby fluid discharged from said nozzle and into said outlet conduit creates a pumping action for removing sewage from said cavity and into said outlet conduit which expedites waste removal therefrom.

5,588,460

FIRE HYDRANT VALVE GUIDE WITH LOCKING SLEEVE AND WRENCH THEREFOR

Aaron B. Meneses, 32527 Jacklynn Dr., Union City, Calif. 94587

Filed Jul. 24, 1995, Ser. No. 506,425
Int. Cl.[6] F16K *35/10;* **E03B** *9/06*
U.S. Cl. 137—296 **5 Claims**



1. A fire hydrant protector against unauthorized use comprising:

a fire hydrant having a valve means with a valve carrier portion and a valve stem, a valve stem guide, said valve stem guide having a pair of open ends with an intermediate threaded portion disposed therebetween, said valve stem guide threaded portion is threadably secured within a threaded fire hydrant opening, with one of said open ends being disposed within said fire hydrant and said other open end extending exteriorly of said fire hydrant, said valve stem guide is removably guided along said valve carrier portion through said open ends, said valve stem having an exposed portion extending coaxally and into one of said ends when said valve means is threadably secured within said fire hydrant opening valve stem guide including screw means for screwing said stem guide into the hydrant, the valve stem coaxially extending from said screw means;

a tubular shield concentrically attached at said exterior open end adjacent said screw means said shield being coaxial with said valve stem and having a length longer than the extension of said valve stem from said valve stem guide, said shield having an interior threaded portion located at said exterior open end;

a threaded plug removably adapted to fit completely within wherein said plug reinforces said shield and prevents said shield from becoming deformed and badly bent, if attempts are made to break said shield of said shield wherein said plug reinforces said shield and prevents said shield from becoming deformed and badly bent, if attempts are made to break said shield, said plug having a deeply grooved pentagonal keyway in its flat outer surface, said plug and said valve stem being rotatable by a single special wrench having an elongated male socket for removably securing said plug within said interior threaded portion and a female pentagonal socket for rotating said valve stem to open and close said valve means, while preventing unauthorized use.

5,588,461

HAZARDOUS MATERIAL CONTAINMENT SYSTEM

Joseph M. Plecnik, Long Beach, Calif., assignor to Philipp Brothers Chemicals, Inc., N.J.

Filed Apr. 8, 1994, Ser. No. 225,376
Int. Cl.[6] B67D *5/32;* **G01M** *3/18*
U.S. Cl. 137—312 **22 Claims**

1. An apparatus for containing hazardous material leaks from a shipping container having a first valve allowing the hazardous material to flow into and out of said shipping container, said apparatus comprising:

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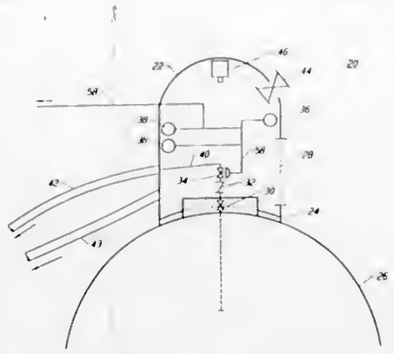


a removable dome having an open bottom shaped to fit over a portion of said container that includes the first valve, said dome being adapted to be placed over said portion of said container during at least one of filling and discharging of hazardous material through said first valve;

sealing means for creating an air-tight seal between said dome and said container such that any leakage of hazardous material at said potion of said container will flow into said dome so as to prevent leakage of the hazardous material into a surrounding environment;

means, in vacuum communication with the interior of said dome, for maintaining at least a partial vacuum within said dome and for neutralizing said hazardous material;

first detector means, mounted within said dome, for detecting the presence of said hazardous material and for generating a first control signal in response thereto; and

a remotely controlled shutoff valve connected to said first valve, said shut of valve being coupled to said first detector means and responsive to shutoff the flow of the hazardous material when said first control signal is generated due to a leakage of hazardous material into said dome.

5,588,462

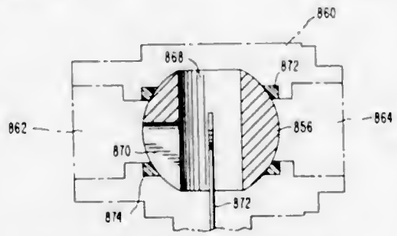
VALVE AND SENSOR ARRANGEMENT

George J. McHugh, Broomall, Pa., assignor to AGF Manufacturing, Inc., Warren, N.J.

Continuation-in-part of Ser. No. 926,285, Aug. 10, 1992, Pat. No. 5,406,979, which is a continuation-in-part of Ser. No. 752,479, Mar. 8, 1990, Pat. No. 5,269,344, which is a continuation-in-part of Ser. No. 320,716, Mar. 8, 1989, Pat. No. 4,993,453, Ser. No. 413,292, Sep. 27, 1989, Pat. No. 4,971,109, Ser. No. 416,111, Oct. 3, 1989, Pat. No. 5,036,883, and Ser. No. 320,713, Mar. 8, 1989, Pat. No. 4,995,423, which is a continuation-in-part of Ser. No. 138,436, Dec. 28, 1987, Pat. No. 4,852,610, which is a continuation-in-part of Ser. No. 881,270, Jul. 2, 1986, Pat. No. 4,741,361, which is a continuation-in-part of Ser. No. 874,653, Jun. 16, 1986, abandoned. This application Apr. 17, 1995, Ser. No. 422,789

Int. Cl.[6] F16K *37/00*

U.S. Cl. 137—557 **30 Claims**



1. A valve and sensor arrangement, comprising:

a valve including a housing and a valve member, said housing comprising an interior chamber and an inlet and an outlet, said valve member being provided within said interior chamber and comprising a passageway, said valve member being movable about a turning axis between a first position which provides communication between the inlet and the outlet of the housing and a second position which restricts communication between the inlet and the outlet of the housing; and

sensor means for sensing a condition of the passageway of the valve member, said sensor means including a sensor element which is provided within said passageway of said valve member, said sensor means being mounted on said housing of the valve with said sensor element being provided within said passageway of said valve member, said sensor element extending within the valve member through an opening in the valve member at an angle with respect to the turning axis of said valve member.

5,588,463

MODULE FOR CONTROLLING PRESSURE IN A HYDRAULIC CIRCUIT

Gilbert Kervagoret, Argenteuil, France, assignor to AlliedSignal Europe Services Technique, Drancy, France

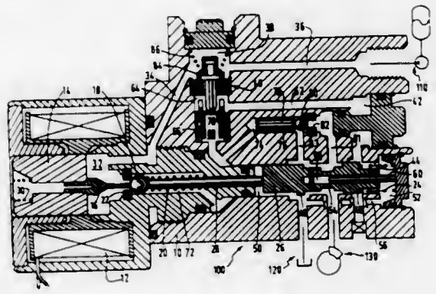
PCT No. PCT/FR94/01151, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO95/12155, PCT Pub. Date May 4, 1995

PCT Filed Oct. 4, 1994, Ser. No. 325,199

Claims priority, application France, Oct. 29, 1993, 93 12912

Int. Cl.[6] F15B *13/044*

U.S. Cl. 137—596.15 **9 Claims**



1. A module for controlling pressure in a hydraulic circuit, comprising at least one generator of pressurized fluid, at least one reservoir of low pressure fluid, and at least one pressure receiver, said module including a solenoid valve having an electric coil and a movable magnetic core plunger, said plunger on moving controlling a position of a distributor slide valve which slides in a bore formed in a body, said bore communicating with a feed passage connected to said generator of pressurized fluid, a distribution passage connected to said pressure receiver, and a pressure relief passage connected to said reservoir of low pressure fluid, said module being characterized by a pressure controlled valve located between said generator and said feed passage, said pressure controlled valve being switched into an opened position when said core plunger actuates the distributor slide valve such that pressurized fluid is directly communicated to said feed passage for communication to distribution passage for transmission to said pressure receiver.

5,588,464

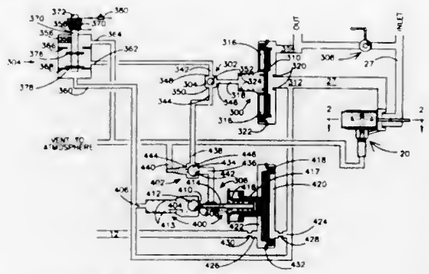
GAS SHUT-OFF VALVE

Gordon Tylosky, 3461 53rd Ave. West, Mukilteo, Wash. 98275

Filed Mar. 13, 1995, Ser. No. 402,843

Int. Cl.[6] E03B *1/00;* **F16K** *31/143*

U.S. Cl. 137—613 **18 Claims**



1. A fluid shut-off system comprising:

a first valve including:

a first valve chamber having a first inlet and a first outlet, said inlet being engagable with a fluid supply line supplying fluid at a supply pressure;

a first valve seat provided at one of said inlet and said outlet;

a first sealing piston housing positioned in registry with said first valve seat and communicating with said first valve chamber;

a first sealing piston positioned within said first sealing piston housing, said first sealing piston being movable between a first open position allowing fluid flow through said first valve chamber and a first closed position sealingly abutting said first valve seat, said sealing piston being biased to move to said first closed position; and

a pressure responsive locking mechanism retaining said first sealing piston in said first open position and allowing said first sealing piston to move to said first closed position in response to above normal fluid pressure in said first valve chamber; and

a second valve acting to interrupt fluid flow through said fluid shut-off system in response to lower than normal pressure downstream of said shut-off system.

5,588,465

VALVE BLOCK

Edgar Witowski, Rutesheim, and Guenter Mayer, Murr, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/00102, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO94/19611, PCT Pub. Date Sep. 1, 1994

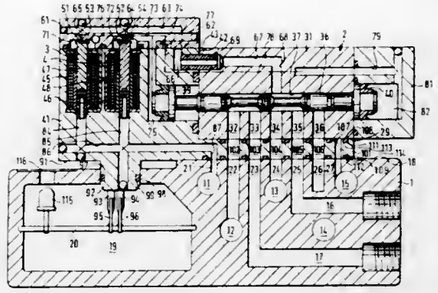
PCT Filed Feb. 3, 1994, Ser. No. 416,720

Claims priority, application Germany, Feb. 24, 1993, 43 05 608.3

Int. Cl.[6] F15B *13/043;13/08*

U.S. Cl. 137—625.64 **8 Claims**

1. A valve block, comprising a baseplate provided with connection orifices in a connection side, ducts for incoming and outgoing air, and a well; a plurality of directional valves arranged next to one another on said connection side of said baseplate with an adapted connection hole pattern; at least one pilot valve assigned to each of said directional valves; an electromagnet actuating said pilot valve; an electrical installation device arranged in said well for extending in said well and having a plug connection; an electrical connecting plug by which said electromagnet engages into said plug connection of said electrical installation device; a common housing in which said pilot valve and said electromagnet are arranged and which has a lateral attachment face bearing against an end face of an associated one of said directional valves;



and a plate-shaped extension projecting laterally from said attachment face of said housing near an underside of said housing and assigned to said connecting plug, said plate-shaped extension being arranged so that said directional valve bears with its connection side against said plate-shaped extension and said baseplate bears with its connection side against said plate-shaped extension, said plate-shaped extension having a plurality of passage bores congruent with said connection orifices of said baseplate and of said directional valve.

5,588,466

MAGNETOSTRICTIVE TRANSDUCER

Gerhard Benz, Boeblingen; Gottfried Flik, Leonberg; Christoph Treutler, Wannweil, and Heinz Friedrich, Friolzheim, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

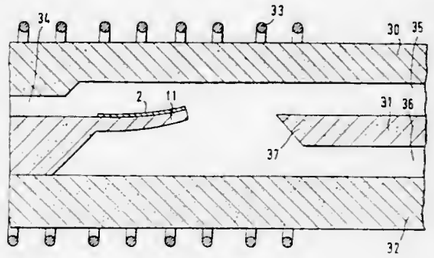
PCT No. PCT/DE93/00489, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/00695, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 8, 1993, Ser. No. 356,281

Claims priority, application Germany, Jun. 20, 1992, 42 20 226.4

Int. Cl.[6] F16K *31/02;* **F15C** *5/00*

U.S. Cl. 137—831 **17 Claims**



1. A magnetostrictive transducer comprising:

means for producing a magnetic field; and

a drive including a first thin layer of magnetostrictive material arranged on a flexible element in the magnetic field, the first thin layer being composed of $Tb_{(1-x)}Dy_{(x)}Fe_2$ ($0<x<1$) and being deposited from a metal vapor.

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5,588,467

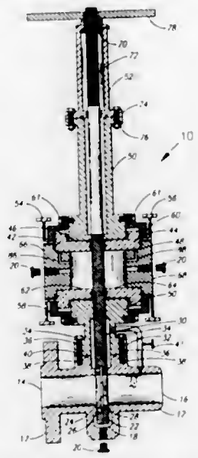
ORIFICE FITTING

Drew E. Crane, Broken Arrow, Okla., assignor to Crane Manufacturing, Inc., Tulsa, Okla.

Filed Mar. 15, 1995, Ser. No. 404,516

Int. Cl.[6] F15D *1/02*

U.S. Cl. 138—44 **18 Claims**



1. An orifice fitting for measurement of fluid flow therethrough, which fitting comprises:

a plate carrier having an orifice plate and carrier plate seals, said plate carrier movable between an orifice body lower chamber and an orifice body upper chamber wherein said plate carrier has two opposed sides;

two entry plugs to allow access to both sides of said plate carrier, said entry plugs have external threads which mate with threads on seal rings;

means to seal said upper body chamber to said plate carrier to produce a fluid-tight seal between said upper body chamber and carrier and between said upper and lower chambers; and

means to allow access to said plate carrier, to said orifice plate and to said carrier plate seals while in said upper chamber without interrupting or disabling fluid flow through said lower chamber.

5,588,468

BLOW-MOLDED COOLANT CONDUIT

Wolfgang Pfleger, Tamins, Switzerland, assignor to EMS-Inventa AG, Zürich, Switzerland

Continuation of Ser. No. 360,321, Dec. 21, 1994, abandoned.

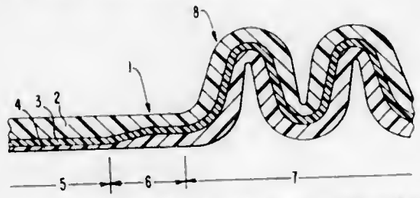
This application Mar. 18, 1996, Ser. No. 617,309

Claims priority, application Germany, Dec. 23, 1993, 9319880 U

Int. Cl.[6] F16L *11/11*

U.S. Cl. 138—121 **13 Claims**

1. A coolant conduit which is an elongate tubular article for an



apparatus requiring cooling by a cooling agent and which is blow molded, consisting essentially of

a plurality of layers which are provided by, in combination, discharging a co-axial melt hose, 3D tubing manipulation, and blow molding thereof, each layer of the plurality being comprised of a thermoplastic polymeric material which is thermoplastically processable,

wherein the plurality of layers comprises:

at least one inner layer which is comprised of a polymeric material which is substantially inert to the cooling agent, which is substantially non-swelling, and which is at least one polymer selected from the group consisting of homopolyolefins and copolyolefins, which at least one polymer may be halogenated or nonhalogenated, and which at least one polymer is provided with functional groups that cause it to be compatible with the outer layer; and

an outer layer which is comprised of at least one polyamide and which is pressure resistant.

5,588,469

HOSE FOR AUTOMOTIVE FUEL PIPING

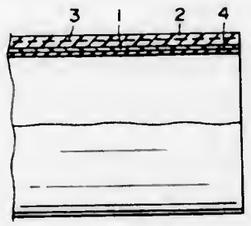
Daisuke Kakiuchi, Okayama; Yasumichi Ogawa, Kurashiki; Hifumi Yasumatsu, Okayama-ken, and Kazutaka Shiraga, Kurashiki, all of Japan, assignors to Marugo Rubber Industries, Ltd., Okayama-ken, Japan

Filed Oct. 12, 1995, Ser. No. 542,111

Claims priority, application Japan, Oct. 17, 1994, 6-250784

Int. Cl.[6] F16L *11/04*

U.S. Cl. 138—137 **3 Claims**



1. A hose for automotive fuel piping comprising:

an inner layer of a terpolymeric fluororesin prepared from tetrafluoroethylene, hexafluoropropylene and vinylidene fluoride,

an outer layer which is a molding obtained by vulcanizing a vulcanization composition comprising a member selected from the group consisting of an epichlorohydrin rubber and a NBR/PVC blend wherein each of the epichlorohydrin rubber and NBR/PVC blend is compounded with a 1,8-diazabicyleo(5.4.0)undecene-7 salt and with an organophosphonium salt, and

an innermost layer of a vulcanization composition comprising a member selected from the group consisting of an NBR rubber, NBR/PVC, hydrogenated NBR rubber and a fluororubber wherein each of the NBR rubber and fluororubber is compounded with a 1,8-diazabicyleo(5.4.0)undecene-7 salt and with an organophosphonium salt,

the above layers being firmly bonded to each other.

5,588,470

WEFT INSERTING DEVICE FOR AN AIR JET LOOM HAVING REED PIECES WITH RECESSED WEFT GUIDE OPENINGS

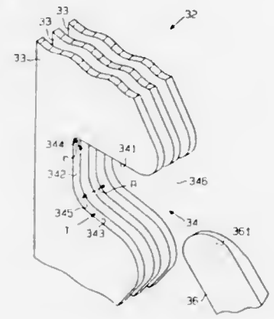
Masao Shiraki, Kariya; Fujio Suzuki, Toyota, and Kazunori Yoshida, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, and Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagakute-cho, both of Japan

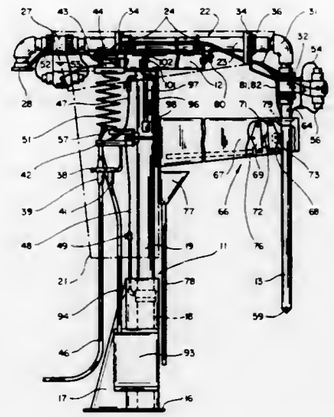
Filed Jul. 5, 1995, Ser. No. 498,786

Claims priority, application Japan, Jul. 5, 1994, 6-153939; May 16, 1995, 7-117411

Int. Cl.[6] D03D *47/30*

U.S. Cl. 139—435.5 **15 Claims**





1. A weft inserting device of an air jet type loom comprising:

a sley;

a reed mounted on said sley, said reed including a plurality of adjacent reed pieces arranged along an inserting direction of a weft, each of said plurality of reed pieces having a recess into which the weft is inserted, a plurality of said recesses being aligned to form a weft passage;

a main nozzle for generating an air jet to insert the wet into the recesses; and

a plurality of supplemental nozzles for generating respective air jets to assist the insertion of the weft into said recesses, said recesses being open towards said air jets generated by said supplemental nozzles;

said recess of each of said reed pieces being substantially defined by three walls, an upper wall, a lower wall and a deep wall, said lower wall being connected to said deep wall by a lower connecting portion having a first radius of curvature and said upper wall being connected to said deep wall by an upper connecting portion having a second radius of curvature, said deep wall being substantially flat and connecting said upper connecting portion to said lower connecting portion, said second radius of curvature being smaller than said first radius of curvature, to converge the air jet generated by said supplemental nozzles toward said upper connecting portion.

5,588,471

CONTAINER FILLING APPARATUS

Terry B. Lowe, 133 Pagosa Way, Fremont, Calif. 94539

Continuation of Ser. No. 584,202, Sep. 18, 1990, abandoned, which is a division of Ser. No. 103,519, Oct. 1, 1987, Pat. No. 4,957,147. This application Mar. 9, 1995, Ser. No. 401,462

Int. Cl.[6] B65B *3/28*

U.S. Cl. 141—83 **3 Claims**

1. In apparatus for filling a container with a liquid: a base, an arm mounted on the base for movement between raised and lowered positions, a filling lance carried by the arm for introducing the liquid into the container, valve means for controlling the flow of liquid through the lance, a drip catcher movable between advanced and retracted positions relative to the lance, a flexible cable which is relaxed when the arm is in its lowered position and is drawn taut by movement of the arm toward its raised position, and means connecting the cable to the drip catcher in such manner that the drip catcher is moved to its advanced position upon further movement of the arm toward its raised position.

5,588,472

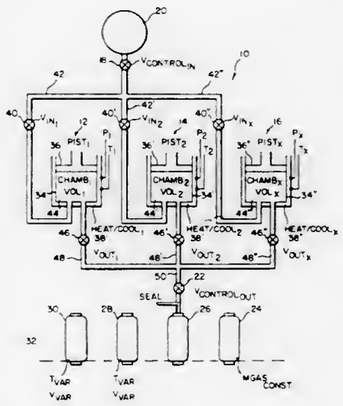
METHOD FOR COMBINED GAS FILL AND PROOF TEST OF PRESSURE VESSELS

Kelly B. Johnson, Layton, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Jun. 14, 1995, Ser. No. 490,185

Int. Cl.[6] B65B *1/30;3/26*

U.S. Cl. 141—83 **12 Claims**



1. A method of gas filling and pressure proof testing a pressure vessel comprising the steps of:

(a) controlling the volume and temperature of the gas going into the pressure vessel to ensure a consistent gas fill mass,

(b) setting the controlled temperature of the gas high enough to cause the fill pressure of the vessel to exceed the required proof pressure of the vessel, and

(c) rapidly discharging the gas fill mass into the pressure vessel and immediately sealing the vessel after filling and allowing the pressure to decrease as the gas fill mass cools.

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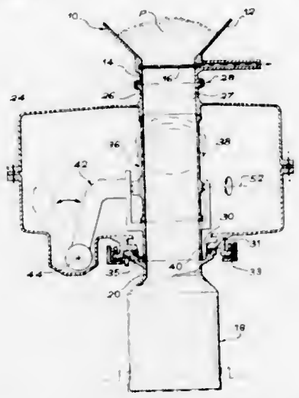
5,588,473

INTERFACE DEVICE FOR THE TRANSFER OF FLUID PRODUCTS BETWEEN TWO CONTAINERS

Charles Glachet, Vendôme, France, assignor to Sne La Calhene, Velizy Cedex, France

Filed May 25, 1995, Ser. No. 451,130
Claims priority, application France, May 31, 1994, 94 06608
Int. Cl.[6] B65B 1/04
U.S. Cl. 141—387 24 Claims



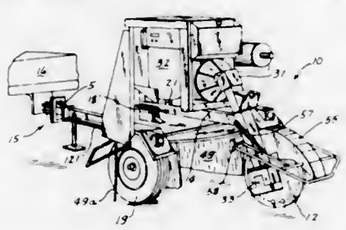
1. Interface device of the transfer of fluid products between two containers, comprising a tight chamber having two aligned openings, a door and a transfer tube formed from at least two sections and placed in said chamber, as well as manipulating means able to displace the door and the transfer tube between an inoperative position, in which the door seals a first of the openings and the transfer tube is retracted in the tight chamber, laterally with respect to the aligned openings, and a transfer position, in which the door is retracted into the chamber, laterally with respect to the aligned openings, and the transfer tube connects the containers in tight manner coaxially to the openings, wherein the two sections of the transfer tube have a substantially uniform and identical internal cross-section and are placed end to end in the transfer position.

5,588,474

FEED RATE CONTROL SYSTEM FOR STUMP CUTTERS

Philip J. Egging, Pella, Iowa, assignor to Vermeer Manufacturing Company, Pella, Iowa

Filed Jun. 7, 1995, Ser. No. 473,102
Int. Cl.[6] A01G 23/06
U.S. Cl. 144—24.12 25 Claims



1. In a stump cutter having an engine operable at a speed of rotation including an optimum speed of rotation, a cutter disposed to cut a tree stump, and means for advancing the cutter toward the stump to engage an uncut area of the stump over a range of movement at a rate of advancement, a method comprising the steps of:

sensing the speed of rotation of the engine; and

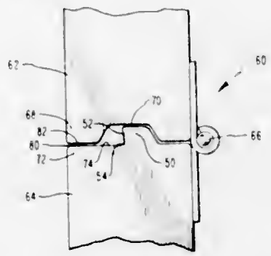
controlling the movement of said advancing means based on the speed of rotation of said engine.

5,588,475

WATER DIVERSION CHANNEL FOR THE JOINT BETWEEN DOOR SECTIONS OF A SECTIONAL DOOR

David O. Martin, Salt Lake City, Utah, assignor to Martin Door Manufacturing, Inc., Salt Lake City, Utah

Filed Apr. 5, 1995, Ser. No. 417,387
Int. Cl.[6] E06B 7/14
U.S. Cl. 160—44 7 Claims



1. A tongue of a tongue and groove joint between adjacent door, said sectional door being disposable in a vertical closed position and a horizontal open position, sections of a sectional door, said tongue including a water diversion channel comprising:

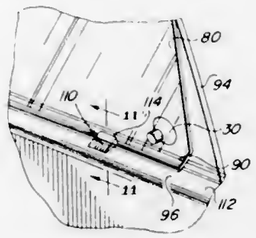
a leading face on said tongue, said leading face having an undercut, said undercut formed by two walls defining an acute angle therebetween forming a basal element of said water diversion channel when the sectional door is oriented toward the horizontal position

5,588,476

REMOVABLE WINDOW SHADE

Brig E. A. Trethewey, 4238 N. 68th Pl., Scottsdale, Ariz. 85251-2312

Filed Aug. 19, 1994, Ser. No. 293,136
Int. Cl.[6] B60J 3/00
U.S. Cl. 160—370.21 2 Claims



1. A window shade for use with a roll down window of a vehicle, said shade comprising in combination:

a) a flexible, resilient, self-supporting sheet of solar radiation filtering material generally conforming in planform with the window;

b) at least one upper suction cup for securing the upper edge of said sheet adjacent the upper part of the window;

c) a lower suction cup for securing the lower edge of said sheet adjacent the lower part of the window;

d) an automatic release mechanism for detaching said lower suction cup from the window to permit displacement of the lower part of said sheet from the window to accommodate lowering of the window;

e) a folded lower edge of said sheet for stiffening the lower part of said sheet; and

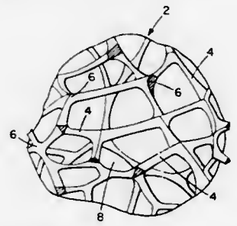
f) means for deflecting said folded lower edge of said sheet away from the window upon lowering of the window.

5,588,477

METHOD OF MAKING METAL MATRIX COMPOSITE

Gerald E. Sokol, Shelby Township; Howard H. Lee, Bloomfield Hills, and Bradley W. Kibbel, Ferndale, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1994, Ser. No. 314,738
The portion of the term of this patent subsequent to Sep. 29, 2014, has been disclaimed.
Int. Cl.[6] B22D 19/14;19/16
U.S. Cl. 164—34 17 Claims



1. A method of making a heterogeneous metal matrix composite comprising the steps of:

providing a fugitive, open-cell, foam substrate comprising a plurality of ligaments interconnected by a plurality of nodes together forming a three-dimensional reticulum defining a multitude of interstitial cells;

impregnating said substrate with a mass of filler particles sufficient to fill said cells with about 5% to 70% by volume of said particles, and to leave at least 30% to about 95% percent by volume interstitial void space between said filler particles in said cells;

heating said particle-filled substrate sufficiently to burn-off said substrate and leave a three-dimensional reticulated network of particle-free capillaries pervading said mass and conforming substantially to the configuration of said substrate;

filling said 30% to about 95% by volume interstitial void space and said capillaries with molten metal; and

allowing said molten metal to cool and solidify to form a metal matrix composite having a network of said metal conforming to said network of particle-free capillaries pervading a mixture of said metal and said particles wherein said mixture comprises at least 30% by volume of said metal distributed substantially uniformly throughout said particles.

8. A method of making a heterogeneous metal matrix composite comprising the steps of:

providing an open-cell, foam metal substrate comprising a plurality of ligaments interconnected by a plurality of nodes which together form a three-dimensional reticulum defining a multitude of interstitial cells;

impregnating said substrate with a slurry of filler particles suspended in a fugitive vehicle, said particles being sufficient to fill said cells with about 5% to 70% by volume of said particles, and to leave 30% to about 95% percent by volume interstitial void space between said filler particles in said cells upon removal of said vehicle;

removing said vehicle;

filling said 30% to about 95% by volume interstitial void space with molten metal; and

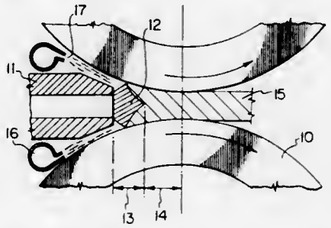
allowing said molten metal to cool and solidify within the interstices between said filler particles to form a metal matrix composite having a network of metal conforming to said substrate pervading a mixture of said metal and said particles wherein said mixture comprises at least 30% by volume of said metal distributed substantially uniformly throughout said particles.

5,588,478

CONTROL OF STICKING IN TWIN ROLL CASTING

Iljoon Jin; David J. Lloyd; Roland S. Timsit, all of Kingston, and Eric R. Lees, Harrowsmith, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 986,244, Dec. 7, 1992, abandoned.
This application Jan. 18, 1994, Ser. No. 182,683
Claims priority, application Canada, Apr. 28, 1992, 2067438
Int. Cl.[6] B22D 11/06
U.S. Cl. 164—480 5 Claims



5. In a high speed twin roll casting process for forming a metal strip in which molten Al—Mg alloy containing less than 2 wt % Mg is fed through a feed nose into a convergent cavity formed between the walls of two rotating rolls with a meniscus of hot metal extending from the feeding nose tip in a casting zone and the metal strip formed in the casting zone is reduced in a rolling zone,

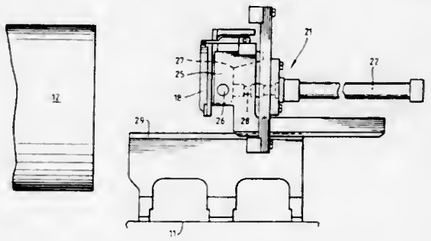
the improvement which comprises shrouding the hot metal meniscus with an oxygen enriched atmosphere by feeding into the region of said meniscus a gas containing at least 25% oxygen to prevent sticking of the alloy strip to the rolls, and adding a small amount of at least one further alloying element to the Al—Mg alloy for inhibiting sticking, said further element being selected from the group consisting of nickel, lead, bismuth and indium.

5,588,479

STRIP CASTING

Darren J. Leadbeatter, Dapto, Australia; Heiji Kato, Yokosuka, and Hisahiko Fukase, Tokyo, both of Japan, assignors to Ishikawajima-Harima Heavy Industries Company Limited, Tokyo, Japan, and BHP Steel (JLA) Pty Ltd., Melbourne, Australia

Filed Oct. 24, 1995, Ser. No. 547,657
Claims priority, application Australia, Jan. 12, 1995, PN0512
Int. Cl.[6] B22D 11/06
U.S. Cl. 164—480 4 Claims



1. A method of casting metal strip comprising:

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supporting a casting pool of molten metal on a pair of chilled casting rolls forming a nip between them;

confining the casting pool by applying a pair of side closure structures to end surfaces of the rolls at the ends of the nip; and

rotating the chilled rolls in mutually opposite directions to produce a solidified strip product passing downwardly from the nip;

wherein the side closure structures are applied to said end surfaces of the rolls by a pair of generally horizontally acting thrusters connected one to each of the closure structures by pivot connections allowing tilting movements of the closure structures, the thrusters apply opposing inward forces to the side closure structures at said pivot connections, and each of the pivot connections is disposed at or below the centre of effort of the outward forces applied to the respective side closure structure by the molten metal of the pool.

5,588,480

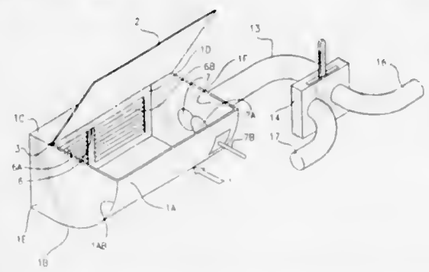
AUTOMOBILE HEAT TRANSFER APPARATUS

Frank Armanno, Sr., 14399 Picea Ct., Fort Pierce, Fla. 34951

Filed Apr. 10, 1995, Ser. No. 419,351

Int. Cl.[6] F25B *29/00;* **B60H** *1/08;1/32;* **F28F** *7/00*

U.S. Cl. 165—300 **4 Claims**



1. Apparatus for controlling the temperature of objects over a wide temperature range, typically between 40 and 80 degrees F., using as the source of heating and cooling a heating and air conditioning system designed to maintain a relatively narrow range of room temperatures, typically between 50 and 70 degrees F., said apparatus maintaining said wide temperature of said objects while said heating and air-conditioning system maintains said narrow range of room ambients, said heating and air-conditioning system having a vent through which issues a first air stream, said air stream being generally above room ambient when the heating portion of said heating and air-conditioning system is activated and is generally below room ambient when said air-conditioning portion of said heating and air-conditioning system is activated, said apparatus comprising:

(a) An enclosure to hold said objects, said enclosure having a plurality of sides,

(b) a first side of said enclosure having a first aperture, said first side being positioned opposite said vent of said heating and air-conditioning system with said first side oriented to place said first aperture in a location to capture at least a portion of said first air stream for entry of said first air stream into said enclosure,

(c) means for securing said first side in said position opposite said vent,

(d) a second side of said enclosure, said second side having a second aperture, said second aperture releasing air from said enclosure which entered said enclosure through said first aperture, said air released from said said second aperture forming a second air stream,

(e) a third side of said enclosure to hold said objects in said enclosure and subject said objects to said first air stream to control the temperature of said objects by means of heat transfer between said objects and said first air stream,

(f) a plate rotatably connected to said enclosure, said plate having a rotational path with respect to said enclosure and said plate being positioned on said enclosure in a first position in its rotational path to cover said second aperture and a second position in its rotational path to uncover said second aperture to block and release said second air stream, respectively, and wherein positions of said plate intermediate of said first and second positions provide varying degrees of blockage to said second air stream to control the flow of air through said enclosure and to control the temperature of said objects within said enclosure, said plate being generally positioned in the horizontal plane and located on top of said enclosure, said plate being rotated to a position that only partially blocks said second air stream by said air stream impinging on said plate, the degree of blockage of said second air stream being controlled by the weight of said plate, the amount of flow within said second air stream and the pressure of said second air stream, the adjustment of the weight of said plate providing one means of varying the blockage of said second air stream and consequently the temperature of the objects within said enclosure

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5,588,481

SYSTEM FOR PROVIDING HEATING, AIR CONDITIONING AND VENTILATION FOR A VEHICLE

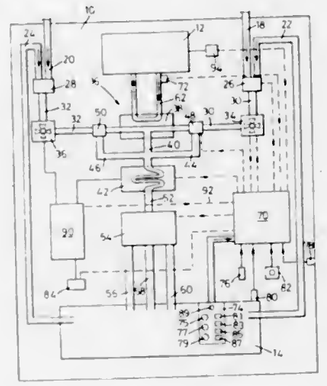
Krzysztof E. Dziama, Solihull, and John Tipping, Warwick, both of England, assignors to Rover Group Limited, Birmingham, England

Filed Jul. 17, 1995, Ser. No. 503,011

Claims priority, application United Kingdom, Jul. 30, 1994, 9415417.6

Int. Cl.[6] B60H *1/00*

U.S. Cl. 165—42 **6 Claims**



1. A system for providing a supply of air to the passenger compartment of a vehicle, the system comprising ducting for supplying air to a vehicle passenger compartment, a blower for propelling air through the ducting, a heat supply for supplying heat to the air, an air cooler for cooling the air, a vehicle speed detector, and a control unit for controlling the speed of the blower, wherein the control unit is arranged to limit the blower to a predetermined blower speed if the blower has been operating for a predetermined period while the vehicle speed is below a predetermined vehicle speed.

5,588,482

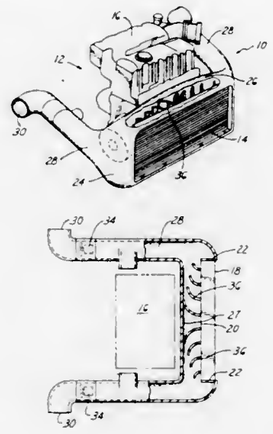
DUCTED COOLING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Thomas C. Holka, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1994, Ser. No. 311,975

Int. Cl.[6] F28D *7/16;* **F01P** *7/02;11/10;* **B60K** *11/08*

U.S. Cl. 165—44 **3 Claims**



1. A cooling apparatus for cooling an engine of an automotive vehicle, comprising:

a radiator in fluid communication with the engine and having a coolant flowing therethrough for cooling the engine, said radiator having a front face for receiving ambient air therethrough and a rear face disposed proximate the engine;

a duct assembly for drawing a flow of air into said radiator and directing the flow of air exiting the radiator away from said vehicle engine, said assembly comprising:

a generally rectangular body partially enclosing said radiator and sealably secured thereto, said body including a selectably openable bleed port disposed proximate said vehicle engine for allowing RAM air to pass therethrough;

a pair of generally curvilinear plenums formed integrally with said body, each of said pair in fluid communication with said body and extending longitudinally from said body, each of said plenums including an engine inlet opening disposed proximate said vehicle engine for drawing engine compartment air therein and an exit end for directing air exiting therefrom to ambient air;

a plurality of generally arcuate, comb-shaped vanes disposed in said body immediately adjacent said rear face of radiator, each of said vanes having a predetermined length and a predetermined radius of curvature depending upon its location relative to a centerline of said radiator, wherein the length of each vane decreases from a larger of two predetermined values for a vane adjacent the centerline of said radiator to a smaller of two predetermined values for a vane adjacent the side edge thereof, wherein approximately half of said plurality of vanes is generally curved toward the plenum disposed on a respective side of said radiator, said plurality of vanes being operative to direct the flow of air exiting said radiator;

a fan assembly disposed in each of said engine inlet openings in said plenums for drawing air through said radiator, said body and said pair of plenums and away from said engine compartment.

5,588,483

HEAT RADIATING APPARATUS

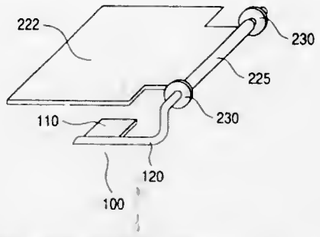
Yoshio Ishida, Osaka, Japan, assignor to Diamond Electric Mfg. Co., Ltd., Osaka, Japan

Filed Jan. 26, 1996, Ser. No. 590,083

Claims priority, application Japan, Jan. 27, 1995, 7-031579

Int. Cl.[6] F28D *11/00*

U.S. Cl. 165—86 **7 Claims**



1. A heat radiating apparatus comprising:

a metal pipe attached to at least one side of a metal plate;

a heat pipe inserted into an internal hollow of said metal pipe, the hollow being filled with grease having high thermal conductivity;

a sleeve seal provided at least one longitudinal end of said metal pipe for sealing the grease in such a way as to permit said heat pipe to freely rotate; and

a heat receiving section through which a part of said heat pipe is in contact with a heating body.

5,588,484

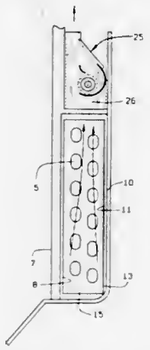
REFRIGERATION FAN SYSTEM

Gerald N. Baker, Florissant, and Gregory R. Maes, Winchester, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 19, 1994, Ser. No. 292,848

Int. Cl.[6] B60H *1/32*

U.S. Cl. 165—122 **4 Claims**



1. In a fan assembly in a refrigerator, by which air is drawn over coils through a coil passage that is thin relative to its width, said coil passage containing said coils, said coil passage being defined by generally parallel front and back walls and side walls extending between said front and back walls, the improvement comprising a fan housing with front, back and side walls, said fan housing having an inlet passage defined by inlet front, back and side walls and having an inlet mouth communicating with said coil passage, an outlet passage having an outlet mouth oriented generally one hundred eighty degrees from said inlet mouth, said outlet passage being defined by outlet front, back and side walls, an intermediate

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back wall, joining the inlet back wall and a back wall surface defining an edge of the outlet mouth; an elongated, cylindrical transverse flow fan supported by and mounted for rotation, about an axis of rotation, between said inlet side walls, said fan having blades outer edges of which lie in a cylindrical surface of revolution, an electric motor connected to rotate said fan; an outlet baffle having a scoop part with a first edge oriented parallel to the axis of rotation of said fan, spaced closely from said surface of revolution of said fan, said scoop part being concave from said first edge toward said outlet mouth on a side facing an inner surface of said intermediate back wall to receive air leaving said fan and exiting said outlet mouth and walls within said housing spaced from one another in a direction along the axis of rotation of said fan, said walls extending perpendicular to the axis of rotation of said fan from the inlet mouth to the outlet mouth of said fan housing, said walls having openings in them through which said fan extends.

5,588,485

PLATE-TYPE HEAT EXCHANGER, FOR USE ESPECIALLY AS AN OIL COOLER

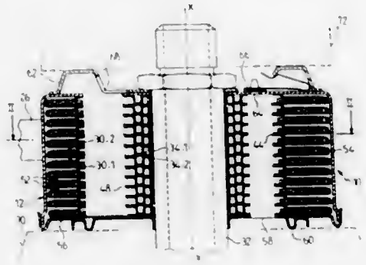
Hélène Gire, Asnieres, France, assignor to VALEO Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Oct. 4, 1994, Ser. No. 317,468

Claims priority, application France, Oct. 12, 1993, 93 12133

Int. Cl.[6] F28F *3/08*

U.S. Cl. 165—157 **6 Claims**



1. A plate-type heat exchanger, for effecting heat transfer between a first fluid and a second fluid and comprising: a casing; inlet means and outlet means for the second fluid disposed on the casing; a central tube extending through the casing and defining a stacking direction; and a stack of heat exchange plates disposed in the casing around the central tube, said plates being disposed in alternating pairs each having a first plate and a second plate, with the plates of each pair defining between them a first flow channel for the first fluid, the pairs of plates defining between one pair and another second flow channels for the second fluid within the casing, the second flow channels being in communication with each other, the heat exchanger further having an inlet for the first fluid, an outlet for the first fluid, and communication means through the successive pairs of plates defining a flow path for the first fluid from said first fluid inlet to said first fluid outlet, wherein each said first plate has a first cylindrical internal collar portion, and each said second plate has a second cylindrical internal collar portion, with said collar portions surrounding the central tube and extending parallel to said stacking direction, and with each said first collar portion of said first plate overlapping a corresponding said second collar portion of said second plate in each of said defining pair of plates, wherein each first plate has a generally flat annular face joined directly to its said first collar portion, and each said second plate has a generally flat annular face and a raised annular portion joining its said annular face to the second collar portion of the second plate, said raised portion being in contact with the flat annular face of the first plate of an adjacent said pair of plates, so as to define a sealing junction between the pairs.

5,588,486

DOWN-HOLE GAS SEPARATOR FOR PUMP

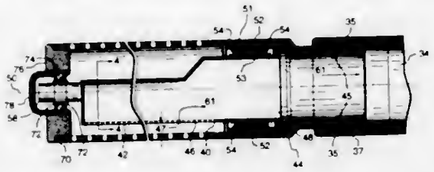
Bernard Heinrichs, Calgary, Canada, assignor to Elan Energy Inc., Calgary, Canada

Filed Mar. 29, 1995, Ser. No. 412,557

Claims priority, application Canada, Mar. 30, 1994, 2120283

Int. Cl.[6] E21B *43/38*

U.S. Cl. 166—50 **16 Claims**



1. A gas separation unit for use with a liquid pump inlet within a horizontal or inclined passageway comprising:

a. a nozzle having a proximal portion and a distal portion,

i. said distal portion defining an inlet opening in the nozzle on only one side of said nozzle for liquid ingress and

ii. said proximal portion adapted to be coupled to the liquid pump inlet so that liquid entering the nozzle through the inlet opening is drawn into the liquid pump inlet;

b. said distal portion including counterweight means for causing the nozzle inlet opening to seek a lowermost position; and

c. means for spacing apart said nozzle and said passageway.

5,588,487

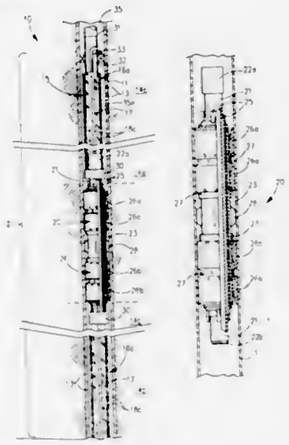
TOOL FOR BLOCKING AXIAL FLOW IN GRAVEL-PACKED WELL ANNULUS

David W. Bryant, Abita Springs, La., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 12, 1995, Ser. No. 527,116

Int. Cl.[6] E21B *43/04;43/08*

U.S. Cl. 166—51 **13 Claims**



1. A well screen for gravel-packing an interval within a wellbore, said well screen comprising:

at least two joints, each of said joints comprising:

a length of screen section; and

at least one axially-extending shunt conduit carried by screen section, and

a well tool for connecting said at least two joints together, said well tool comprising.

at least one by-pass tube axially aligned and forming a fluid path between said at least one axially-extending shunt conduit on each of said joints; and

means on said well tool for preventing any substantial annular, axial flow of fluids past said tool when said well screen is in an operable position within the wellbore.

9. A well tool for connecting at least two joints of well screen together, said well tool comprising:

a central conduit;

at least one by-pass tube axially aligned on said central conduit and adapted to form a fluid path between at least one axially-extending shunt conduit on each of said joints when connected together; and

means on well tool for preventing any substantial annular, axial flow of fluids by said tool when said well screen is in an operable position within the wellbore.

5,588,488

CEMENTING MULTI-LATERAL WELLS

Jan P. Vijn, Leiderdorp; Zacharias Xenakis, Alkmaar, both of Netherlands; Daniel L. Bour, and Jerry D. Childs, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 22, 1995, Ser. No. 518,082

Int. Cl.[6] E21B *33/14;* **C04B** *7/00*

U.S. Cl. 166—293 **20 Claims**

1. A method of cementing conduits in a multi-lateral subterranean well whereby the set cement can withstand impacts and shocks subsequently generated by drilling and other well operations without shattering, comprising the steps of:

(a) introducing a cement slurry composition which sets into a high strength impact resistant solid mass between said conduits and the walls of said well, said cement slurry composition comprising

a styrene/butadiene aqueous latex,

an effective amount of a latex stabilizer selected from the group consisting of surfactants having the formula

$$R-Ph-O+OCH_2CH_2\rightarrow_m H$$

wherein R is an alkyl group having from 5 to 30 carbon atoms, Ph is phenylene and m is an integer in the range of from about 5 to about 50, and surfactants of the general formula

$$R_1+OR_2\rightarrow_n SO_3X$$

wherein R_1 is selected from table group consisting of C_1–C_{30} alkyl groups, C_5–C_6 cycloalkyl groups, C_1–C_4 alkyl substituted C_5–C_6 cycloalkyl groups, phenyl, alkyl substituted phenyl of the general formula $(R_3)_a$ Ph—where Ph is phenylene, R_3 is a C_1–C_{18} alkyl group and a is an integer of from 1 to 3, and phenyl (C_1–C_{18}) alkyl groups having a total of from about 8 to about 28 carbon atoms, R_2 is a substituted ethylene group of the formula —CH_2CH R_4 wherein R_4 is selected from hydrogen, methyl, ethyl or mixtures thereof, and n is a number from 0 to about 40 provided that when R_1 is phenyl or alkyl substituted phenyl, n is at least 1 and X is any compatible cation, and

hydraulic cement; and

(b) allowing said cement slurry composition to set in said well.

5,588,489

LIGHTWEIGHT WELL CEMENT COMPOSITIONS AND METHODS

Jiten Chatterji, Duncan; James E. Griffith, Loco; Patty L. Totten, and Bobby J. King, both of Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 31, 1995, Ser. No. 551,101

Int. Cl.[6] E21B *33/138*

U.S. Cl. 166—293 **36 Claims**

1. A method of cementing a zone in a well comprising the steps of:

providing a cement composition consisting essentially of slag cement, water present in an amount sufficient to form a pumpable slurry, a gas present in an amount sufficient to foam said slurry and a foaming agent; and

placing said cement composition in the zone.

5,588,490

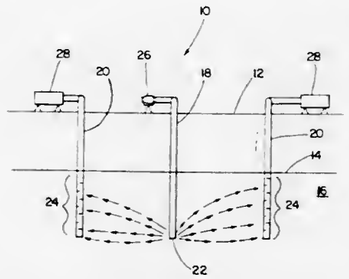
METHOD AND SYSTEM TO ACHIEVE TWO DIMENSIONAL AIR SPARGING

Suthan S. Suthersan, Yardley, Pa.; Boris Dynkin, Newton, and Richard Cushing, Reading, both of Mass., assignors to Geraghty & Miller, Inc., Denver, Colo.

Filed May 31, 1995, Ser. No. 456,231

Int. Cl.[6] E21B *43/18;* **B01D** *19/00*

U.S. Cl. 166—370 **11 Claims**



1. A process for removing volatile contaminants in a two-dimensional configuration from a contaminated area of the earth, wherein the contaminated area of the earth has a phreatic zone, the contaminant being present in the phreatic zone, the process comprising the steps off:

establishing a first borehole in said earth, said first borehole terminating in said phreatic zone;

establishing a second borehole spaced from said first borehole in said earth and which terminates in said phreatic zone;

positioning a first conduit in said first borehole;

positioning a second conduit in said second borehole;

applying air under pressure to said first conduit effective to induce a flow of air from said first conduit into said phreatic zone; and

applying a vacuum to said second conduit effective to induce a flow of air and a gas containing vapor of said contaminant present in said phreatic water out of said second conduit, wherein said air flow through said phreatic zone is substantially perpendicular to the natural flow of said phreatic water.

7. A system for removing volatile contaminants from the phreatic zone of a contaminated ground area, which comprises:

a first borehole terminating in said phreatic zone;

a first conduit disposed within said first borehole;

a second borehole spaced apart from said first borehole and terminating in said phreatic zone;

a second conduit disposed within said second borehole;

a blower operatively connected to said first conduit wherein said first conduit is in fluid flow communication with said blower; and

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a vacuum operatively connected to said second conduit wherein said second conduit is in fluid flow communication with said vacuum.

5,588,491

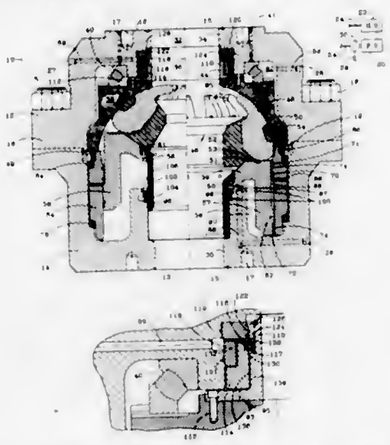
ROTATING BLOWOUT PREVENTER AND METHOD

James D. Brugman, Spring, and Paul L. Tasson, Missouri City, both of Tex., assignors to Varco Shaffer, Inc., Houston, Tex.

Filed Aug. 10, 1995, Ser. No. 513,436

Int. Cl.[6] E21B *33/06;33/08*

U.S. Cl. 166—383 **20 Claims**



1. A rotatable blowout preventer for use in a hydrocarbon recovery operation including a tubular member passing through the blowout preventer, the rotatable blowout preventer assembly comprising:

a stationary outer housing defining a bore therein for receiving the tubular member, the outer housing have a central axis generally concentric with an axis of the tubular member, and the outer housing including a fluid closing port and a fluid output port therein;

an inner housing rotatable within the outer housing and having an inner curved surface thereon substantially defined by a portion of a sphere having a center substantially adjacent the central axis of the bore;

an annular sealing assembly supported within the inner housing for sealed engagement with the tubular member, a sealing assembly including a plurality of rigid elements circumferentially arranged about the bore of the outer housing, each rigid element having an outer surface for sliding engagement with the inner curved surface of the inner housing, and the sealing assembly including a resilient member for sealed engagement with the tubular member;

a rotatable piston axially movable within the outer housing in response to pressurized fluid in the fluid closing port for causing both axial and radial movement of the annular sealing assembly;

a lower rotary seal between the piston and a lower portion of the stationary outer housing for sealing pressurized fluid within the stationary outer housing from a lower end of the bore in the outer housing;

a flow restriction member between the rotatable inner housing and an upper portion of the stationary outer housing for reducing fluid pressure downstream of the flow restriction member to less than 40% of the pressure upstream from the flow restriction member; and

an upper rotary seal between the rotatable inner housing and the upper portion of the stationary outer housing and downstream from the flow restriction member for sealing the reduced pressure fluid within the outer housing from an upper end of the bore in the outer housing.

16. A method of controlling actuation of a rotatable blowout preventer for use in a hydrocarbon recovery operation including a tubular member passing through the blowout preventer, the rotatable blowout preventer including a stationary outer housing defining a bore therein for receiving the tubular member, an inner housing rotatable within the outer housing, an annular sealing assembly supported within the inner housing for sealed engagement with the tubular member, a piston movable within the outer housing for causing radial movement of the annular sealing assembly, and a fluid closing port and a fluid output port in the outer housing for passing pressurized fluid to the piston, the method comprising:

providing a lower rotary seal between the piston and a lower portion of the outer housing for sealing pressurized fluid within the stationary outer housing from a lower end of the bore in the outer housing;

providing a flow restriction between the rotatable inner housing and an upper portion of the stationary outer housing for reducing fluid pressure downstream of the flow restriction member to less than 40% of the pressure upstream from the flow restriction; and

providing an upper rotary seal between the rotatable inner housing and an upper portion of the stationary outer housing and downstream from the flow restriction for sealing the reduced pressure fluid within the stationary outer housing from an upper end of the bore in the outer housing.

5,588,492

HAND INJECTOR GAS FIRE EXTINGUISHER

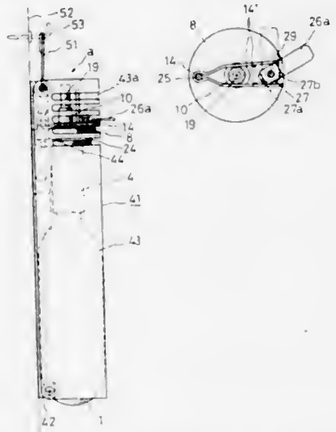
Masaru Fujiki, Tokyo, Japan, assignor to Glory Kiki Co., Ltd., Himeji, Japan

Filed Oct. 5, 1994, Ser. No. 318,296

Claims priority, application Japan, Apr. 7, 1994, 6-095883

Int. Cl.[6] A62C *35/02*

U.S. Cl. 169—11 **8 Claims**



1. A hand injector gas fire extinguisher comprising a hand injector and a cylinder which is filled only with a fire extinguishing gas in a liquid state having a cooling fire extinguishing function based on gasification latent heat of a liquified gas when gasified and an oxygen deficiency fire extinguishing function based on expansion thereof and which is sealed at a head portion of said cylinder with a seal member, said hand injector having a firing pin unit for breaking said seal member of said cylinder, a cylinder receiving unit for retaining said cylinder and supporting said firing pin unit, a retainer unit for maintaining said firing pin unit in an inoperative state, and a retainer operating device for releasing said retainer unit by a manual operation and thereby operating said firing pin unit,

wherein said cylinder has a thread on an outer circumferential surface of said head portion thereof, said thread corresponding and engaging a thread on an inner surface on a first end of said cylinder receiving unit, said cylinder receiving unit consisting of a cylinder receiver having a hollow portion into which said head portion is inserted from a first end of said hollow portion by engaging said thread on said cylinder with the thread on the inner surface of a first end of said cylinder receiver, said cylinder receiver also having a through bore, a diameter of said through bore being slightly smaller than that of said hallow portion on a second end of said cylinder receiver and adjacent to said hollow portion; said hollow portion and said through bore communicating with each other so that a joint portion thereof forms a stepped portion,

wherein said firing pin unit consists of:

a shaft which has a flange at a first end thereof, and a recess in which an O-ring is fitted on a second end thereof, the shaft further having a retainer recess in which the retainer unit is fitted in between the second end of said shaft and said O-ring-fitted recess, the shaft being inserted into said cylinder receiver so that the first end of the shaft and the second end of the shaft are respectively fitted in said hollow portion and said through bore of said cylinder receiver;

a firing pin projecting from and fixed to the first end of said shaft; and

a spring provided in a normally compressed state between said flange of said shaft fitted in said cylinder receiver and said hollow portion and said stepped portion constituting said joint portion,

wherein said retainer unit consists of a bent retainer having a pair of leg portions engaged in said retainer recess, and a bolt inserted through a head portion of said retainer unit fixing said head portion to the second end of the cylinder receiver,

wherein said retainer operating device consists of a manual cam engaged between said leg portions of said bent retainer, in such a manner that said leg portions can be opened by turning said cam pivotably around on a surface of a second end of said cylinder receiving unit, and a safety pin provided vertically on the second end of said cylinder receiving unit so as to maintain said leg portions in a normally unopenable condition,

wherein said cam consists of a cam portion having a pair of vertical projections having a width substantially equal to a distance between said leg portions, said projections being opposite each other so that they are spaced from each other by a distance equal to that between said leg portions when moved to an open state, and a manual lever portion joined to said cam portion.

5,588,493

FIRE EXTINGUISHING METHODS AND SYSTEMS

Yechiel Spector; Esther Jacobson, both of Tel Aviv; Vida Naishtut, Kiriat Gat; Michael Vittenberg, and Zohar Beinert, both of Beersheva, all of Israel, assignors to Spectronix Ltd., Sderot, Israel

Division of Ser. No. 120,497, Sep. 14, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,993

Claims priority, application Israel, Feb. 16, 1993, 104758; Jul. 18, 1993, 106382

Int. Cl.[6] A62C *2/00;3/00;* **A62D** *1/06*

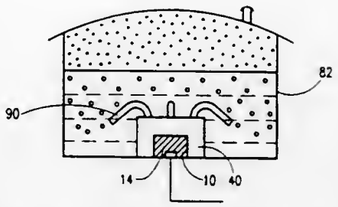
U.S. Cl. 169—46 **2 Claims**

1. A method of extinguishing a fire in a volume comprising:

(a) submerging a nontoxic fire extinguishing device in a liquid coolant, said device includes means for preventing entry of said coolant into said device; said device includes a composition which comprises:

(1) a first oxidant reactant; and

(2) a second reductant reactant;



(b) activating said fire extinguishing device by reacting said composition comprising said first reactant and said second reactant, to create solid particulate products having a diameter of about one micron or less, such that when said products come in contact with the fire, said products chemically inhibit the chain reactions of the fire flame and bring about the extinguishing of the fire; and

(c) passing the said solid particulate products into said liquid coolant without any accompanied destruction of said nontoxic fire extinguishing device.

5,588,494

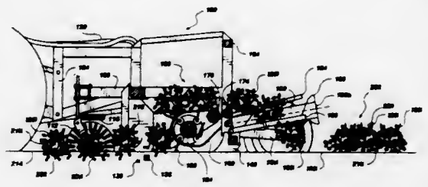
CROP INVERTER AND METHOD OF USING SAME

J. Paul Pickett; Dee L. Jones, and Jay D. Christensen, all of Burley, Id., assignors to Pickett Equipment, Burley, Id.

Filed Aug. 25, 1995, Ser. No. 519,316

Int. Cl.[6] A01D *29/00*

U.S. Cl. 171—124 **45 Claims**



1. An inverter for digging and inverting crops having pods which are disposed in soil, the inverter comprising:

digging means for loosening soil and for lifting the crops from the soil, the digging means comprising a first rotating bar disposable below the pods of the crop so as to sever roots extending below the pods and a second rotating bar disposed at a level adjacent said pods and disposed such that rotation of the second rod lifts the pods in the soil;

pick-up means for lifting the crops above the soil and for allowing soil to fall from the crops;

inverting means for inverting the crops from an upright growing orientation and placing the crops in a windrow such that the pods are disposed on top of the windrow; and

slinger means disposed between the pick-up means and the inverter means for conveying the crops between the pick-up means and the inverter means and for removing soil from the crops, the slinger means comprising at least one rotatable tube.

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5,588,495

ADAPTOR FOR HAND-HELD POWER TOOL

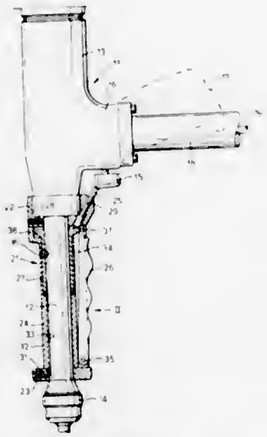
Aiden R. Dear, Stotfold Nr. Hitchin, and John E. Higgs, Potters Bar, both of England, assignors to Avdel Systems Limited, Hertfordshire, England

Filed May 26, 1995, Ser. No. 450,146

Claims priority, application United Kingdom, May 27, 1994, 9410697

Int. Cl.[6] B23B *51/12*

U.S. Cl. 173—170 **24 Claims**



1. An adaptor for a hand-held power tool which comprises a tool body and a tool trigger located at a position fixed in relation to the body, which adaptor comprises

securing means for being releasably secured to the tool body in fixed relationship thereto;

a grip for being gripped by an operator, said grip having a longitudinal axis and being rotatable about the longitudinal axis of the grip when the securing means is secured to the tool body;

an auxiliary trigger mounted on the grip; and

intermediate means for operatively connecting the auxiliary trigger on the rotatable grip to the tool trigger on the tool body;

actuation of the auxiliary trigger causes the intermediate means to actuate the tool trigger over a range of relative rotational positions of the grip means and the tool body.

5,588,496

SLIP CLUTCH ARRANGEMENT FOR POWER TOOL

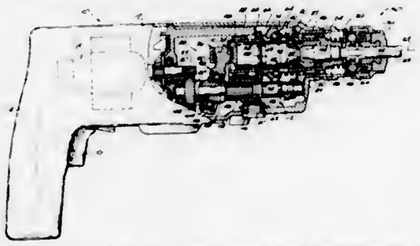
William A. Elger, Waukesha, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Mich.

Filed Jul. 14, 1994, Ser. No. 275,151

Int. Cl.[6] B60K *41/02*; **F16D** *3/56*

U.S. Cl. 173—178 **21 Claims**

1. A power tool comprising a tool housing, an output shaft



rotatably mounted in the tool housing and including an outer surface including a plurality of circumferentially spaced detent depressions, a driving member mounted in the tool housing, and a clutch assembly operable to transmit torque from the driving member to the output shaft and including an annular clutch member supported on the output shaft and including a like plurality of circumferentially spaced pockets respectively corresponding to the detent depressions on the output shaft and respectively including ramps extending in acute relation to said output shaft, a like plurality of torque transmitting elements respectively retained in the pockets against circumferential movement relative to the clutch member and being movable between seated positions in the detent depressions to engage torque transmission between the clutch member and the output shaft and unseated positions with respect to the detent depressions to disengage torque transmission between the clutch member and the output shaft, and biasing means engaging the torque transmitting elements to bias the torque transmitting elements against said ramps and toward the seated positions in the detent depressions.

5,588,497

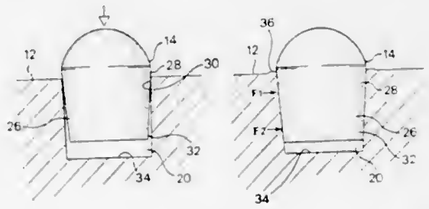
MOUNTING DRILL BUTTONS

Peter R. Thorburn, Welkom, South Africa, assignor to Galison Drilling (Proprietary) Limited, Welkom, South Africa

Filed Feb. 14, 1995, Ser. No. 388,457

Int. Cl.[6] E21B *10/52*; *10/56*, *10/62*

U.S. Cl. 175—420.1 **16 Claims**



1. A method of mounting a hard insert in a cutting tool comprising the steps of:

providing a hard insert having a head and a tapered shank,

providing a cutting tool having a body defining at least one seat shaped and tapered complementally to the shank of the insert, the seat having an inner end, an outer end and an upstanding sidewall extending between the inner and outer ends; and

urging the insert into the seat so that the shank of the insert engages the sidewall of the seat in a friction fit, with the end of the shank clear of the inner end of the seat,

wherein both the shank of the hard insert and the sidewall of the seat are tapered conically, with the cone angle of the shank being greater than that of the sidewall, so that when the insert is urged into the seat sufficiently far that the lower end of the shank contacts the sidewall of the seat adjacent the inner end of the seat, the material of the cutting tool body is deformed outwardly at the upper edge of the seat by the upper end of the shank.

5. A cutting tool comprising,

a body defining at least one seat, the seat having an inner end, an outer end and an upstanding sidewall extending between the inner and outer ends; and

a hard insert having a head and a tapered shank retained in the at least one seat;

the seat being shaped and tapered complementally to the shank of the hard insert so that the shank of the insert engages the sidewall of the seat in a friction fit, with the end of the shank clear of the inner end of the seat, wherein both the shank of the hard insert and the sidewall of the seat are tapered conically, with the cone angle of the shank being greater than that of the sidewall.

5,588,498

ELECTRIC HYBRID VEHICLE

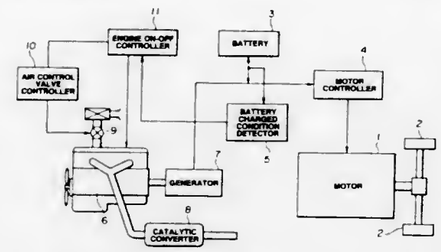
Shinichiro Kitada, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 13, 1993, Ser. No. 135,515

Claims priority, application Japan, Oct. 21, 1992, 4-282562

Int. Cl.[6] B60K *6/02*

U.S. Cl. 180—65.4 **15 Claims**



8. An engine system for driving a generator applied to an electric vehicle, said engine system comprising:

an internal combustion engine intermittently operating for generating electric power by operation of the generator and connected to an intake system and an exhaust system;

an intake air control valve connected to the intake system; and

an intake air control valve controller controlling said intake air control valve so as to suppress the intake air amount at a predetermined small flow rate for a predetermined time after starting of said engine.

5,588,499

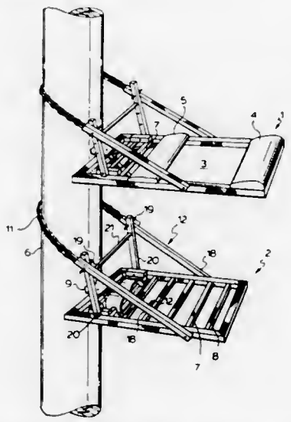
TREE STAND

Steven N. Carriere, P.O. Box 792, Lindsay, Ontario, Canada

Filed Mar. 10, 1995, Ser. No. 401,501

Int. Cl.[6] E04G *3/00*

U.S. Cl. 182—135 **16 Claims**



1. A removable stand for temporary attachment to a tree trunk or the like comprising:

a platform adapted for extending laterally outwardly from the tree trunk, the platform having a load supporting portion between opposing sides;

engaging means on an inward portion of the platform adapted for releasably engaging an adjacent segment of the tree trunk;

a chain having two ends each secured to an opposing side of the platform, the chain adapted for releasably encompassing the tree trunk upward of said engaging means and defining a plane transverse an axis of the tree trunk, the chain being flexible in aid plane and resistant to flexure perpendicular to said plane; and

resilient biasing means engaging the chain for resiliently urging the flexible chain, during lifting or lowering of the stand, in a direction of said plane outwardly from the tree trunk to disengage the chain from the tree trunk;

wherein the chain is comprised of two parallel spaced apart rows of overlapping links transversely interconnected by pins disposed substantially normal to said plane, the links and pins defining a longitudinal series of apertures therebetween;

wherein the biasing means comprise an elongate flexible member having an inherent tendency to assume a selected configuration when unstressed;

the elongate flexible member extending along the length of the chain engaging each link of the chain;

the strand further including a support bracket on each opposed side of the platform, the brackets each comprising:

securing means for adjustably connecting an associated end of the chain to an upper portion of the bracket;

an upwardly extending post having a lower end pivotally connected to an inward portion of an associated side;

an upwardly inwardly inclined strut having a lower end pivotally connected to an outward portion of the associated side; and

connecting means for releasably connecting the upper ends of associated posts and struts members for rotation between an erect operative position and a folded storage position; and

wherein each strut is an inwardly open hollow tube, an associated end of the chain being telescopically housed within each strut, and including a removable connecting rod projecting through mating bores in the upper ends of an associated post and hollow strut, the rod projecting through an aperture of the chain housed within the associated strut.

5,588,500

ELEVATABLE WORK FACILITY

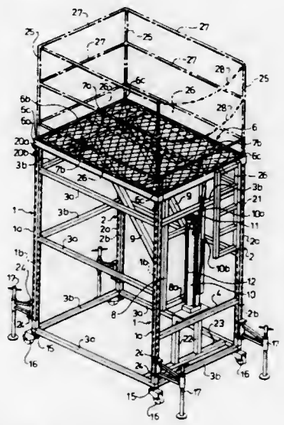
Yoshihiro Yonahara, Ohmiya, Japan, assignor to Japan Steels International Inc., Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 346,230

Claims priority, application Japan, Sep. 14, 1994, 6-247017

Int. Cl.[6] E04G *1/18*

U.S. Cl. 182—141 **15 Claims**



1. An elevatable work facility comprising:

a substantially horizontal scaffolding floor having four corners;

four substantially vertical struts respectively comprising four substantially vertical first casings having upper ends respectively connected to said four corners of said scaffolding floor,

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and four substantially vertical second casings respectively telescopically coupled with said first casing, one of said first casing and said second casing constituting outer casing and the other of said first casing and said second casing constituting inner casing;

a plurality of transverse rods connected between said outer casings of said struts;

a jack supporting frame fixed between lower parts of said struts;

a fluid-actuated jack attached to said jack supporting frame and extending substantially vertically in parallel to said struts, said jack including a cylinder and a piston slidably mounted in said cylinder, one of said cylinder and said piston being fixed to said jack supporting frame and constituting a fixed jack member, and the other of said cylinder and said piston constituting a movable jack member;

a rotary member rotatably mounted to an upper end of said movable jack member;

a support frame protruding downwardly from said scaffolding floor; and

an elongated flexible member having a first end fixed to said fixed jack member, a second end fixed to said support frame, and an intermediate portion engaged about said rotary member;

whereby movement of said movable jack member a first distance relative to said fixed jack member causes said scaffolding floor to be moved substantially twice said first distance.

5,588,501

Patent Not Issued For This Number

5,588,502

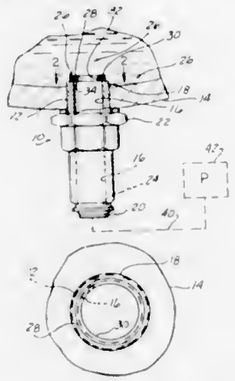
QUICK CONNECT NIPPLE HAVING A CYLINDRICAL MAGNET

Ram D. Bedi, and Adrianus J. van der Griendt, both of Bloomfield Hills, Mich., assignors to K. J. Manufacturing Co., Wixom, Mich.

Filed Aug. 30, 1995, Ser. No. 521,596

Int. Cl.[6] F16C *3/14*

U.S. Cl. 184—1.5 **3 Claims**



1. A one-piece device for a vehicle for changing oil in an internal combustion engine having an oil pan reservoir, the oil pan reservoir having a floor bottom and an access aperture in the floor bottom; the device comprising:

a quick connect nipple having a first end threadably mating into the access aperture and a second end releasably engageable with a mating quick connect fitting positioned on an externally located fluid delivery device, and having a throughbore therebetween;

means for establishing fluid tight closure of said quick connect nipple when said nipple is disengaged from said fluid delivery device; and

a magnet secured to the first end of the quick connect nipple for capturing metallic material in the oil pan reservoir, said magnet having a through center passage and an upper end exposed to fluid in the oil pan reservoir, said magnet positioned adjacent the throughbore so that oil passes through the center passage of the cylindrical magnet prior to entering the throughbore during the oil changing process.

5,588,503

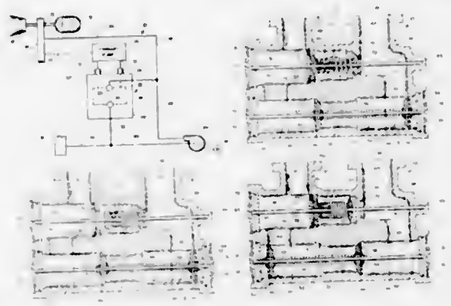
FLOW CONTROLLER

John M. Rinaldo, E. Greenbush, N.Y., assignor to Atlas Copco Aktiebolag, Sweden

Filed Aug. 21, 1995, Ser. No. 517,505

Int. Cl.[6] F01M *1/18*

U.S. Cl. 184—6.4 **18 Claims**



1. A flow control apparatus for protecting a rotating machine that is coupled to a primary pump from experiencing lubrication starvation in the event the machine and pump go into reverse rotation, the apparatus including:

a housing having an inlet channel connected to the discharge side of the primary pump and an outlet channel being spaced apart from said inlet channel, said outlet channel being connected to the suction side of the primary pump,

said housing further including a first shuttle passage connecting said spaced apart channels and a second discharge passage spaced apart from said shuttle passage also connecting said spaced apart channels,

a first flow means for connecting said shuttle passage with an oil reservoir,

a second flow means for connecting said discharge passage to the rotating machine for providing lubricating oil to said machine,

a shuttle having axially spaced sealing elements, said shuttle being slidably mounted upon a first slide rod that is centrally positioned in said shuttle passage, said shuttle being arranged to slide along said first slide rod in response to pressure being exerted thereon by oil flowing through said housing to selectively place said first flow means in fluid flow communication with one of said channels, and

a pair of free floating sealing disks that are slidably mounted upon a second slide rod that is centrally mounted in said discharge passage, said disks being arranged to slide along said second slide rod in response to pressure being exerted thereon by oil flowing through said housing to selectively place said second flow means in fluid flow communication with one of said channels.

5,588,504

PROCESS AND ARRANGEMENT FOR SUPPLYING LUBRICANT TO A RECIPROCATING PISTON ENGINE

Leo Spiegel, and Franz Pischinger, both of Aachen, Germany, assignors to FEV Motorentechnik GmbH & Co., Aachen, Germany

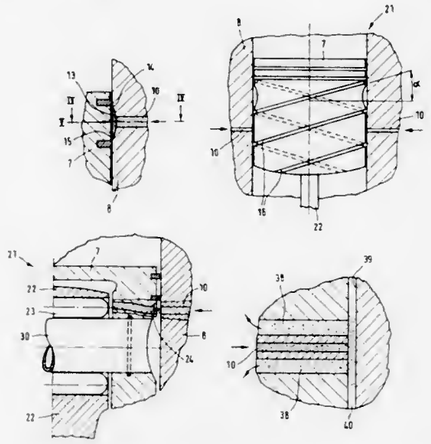
PCT No. PCT/EP94/02262, § 371 Date Jun. 1, 1995, § 102(e) Date Jun. 1, 1995, PCT Pub. No. WO95/02753, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 11, 1994, Ser. No. 403,746

Claims priority, application Germany, Jul. 12, 1993, 43 23 262.0

Int. Cl.[6] F01M *1/00*

U.S. Cl. 184—6.8 **23 Claims**



1. A process for supplying a liquid lubricant to points of a reciprocating piston engine which are to be lubricated and which include at least running surfaces of a piston-cylinder tube unit of the reciprocating piston engine, the reciprocating piston engine having a piston and a cylinder, the process comprising the steps of:

uniting the lubricant in at least one conditioning device with a gaseous transport medium;

forming, in the conditioning device, a lubricating mixture including small liquid particles of lubricant carried by the gaseous transport medium;

passing at least one of the lubricating mixture and the lubricant with the gaseous transport medium through a plurality of supply ducts corresponding to the points to be lubricated; and

drawing away, through at least one drain disposed in a region of the points to be lubricated, the gaseous transport medium and excess lubricant from the points to be lubricated.

13. An assembly comprising:

a reciprocating piston engine including a piston cylinder tube unit having:

a cylinder including a cylinder wall, the cylinder wall having therein at least one supply bore for supplying lubricant as small liquid particles carried in a gaseous transport medium to points of the piston cylinder tube unit to be lubricated;

a piston having an outermost surface, an interior region, a piston bearing disposed in the interior region, an uppermost piston ring and a lowermost piston ring, the piston rings being disposed in a circumferential direction about the outermost surface of the piston, the piston being disposed in the cylinder such that it defines an interstice between its outermost surface and the cylinder wall and further being adapted to move axially between a bottom dead center position and a top dead center position, the supply bore in the cylinder wall being disposed such that it discharges lubricant into the interstice and below the uppermost piston ring when the piston is in its bottom dead center position, the outermost surface of the piston further including:

at least one groove having:

at least one axial groove portion extending, at a region beginning at a lower end of the piston, essentially in an axial direction of the piston, the axial groove further including:

a bottom end disposed at the lower end of the piston such that the supply bore discharges lubricant into the bottom end when the piston is at its bottom dead center position;

a lower end portion extending axially upward from the bottom end; and

an upper end portion adjoining and circumferentially offset with respect to the lower end portion such that, during a downward axial movement of the piston before bottom dead center is reached, the supply bore does not communicate with the upper end portion and is covered by the outermost surface of the piston over a predetermined range of the axial movement of the piston;

a circumferential groove portion adjoining the axial groove portion and extending in the circumferential direction of the piston below the lowermost piston ring; and

a transition groove portion disposed between and adjoining both the upper end portion and the circumferential groove portion; and

a draining means for draining the lubricant away from the points of the piston cylinder tube unit to be lubricated, the draining means including a venting bore communicating with the circumferential groove portion and discharging lubricant into the piston bearing disposed in the interior region of the piston; and

a means for supplying liquid lubricant to the reciprocating piston engine, the means being operatively connected to the reciprocating piston engine and including means for transporting the liquid lubricant to the supply bore of the piston cylinder tube unit.

5,588,505

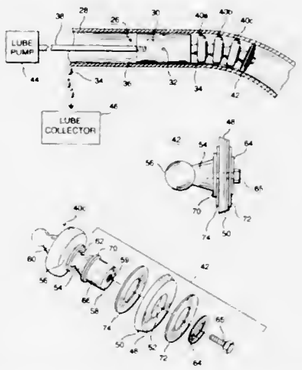
CLEANING ATTACHMENT FOR INTERNAL TUBE MANDREL

Phillip T. Heath, Shelbyville, Tenn., assignor to Calsonic North America, Inc., Irvine, Calif.

Filed Jun. 12, 1995, Ser. No. 489,215

Int. Cl.[6] F16N *1/00*

U.S. Cl. 184—18 **21 Claims**



1. A cleaning attachment for cleaning the interior surface of a tube during a bending operation that employs an internal mandrel assembly, said cleaning attachment comprising:

a linking member having a free end, a connecting end configured to pivotally couple to said internal mandrel assembly,

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and a mounting surface originating proximate said free end and terminating between said connecting end and said free end,

a wiper sized to fit within said tube and having a central mounting hole formed therein, said central mounting hole being configured to slidably engage said mounting surface; and

means for securing said wiper to said linking member.

18. A method for cleaning and supporting the interior surface of a tube during a bending operation, said method comprising the steps of:

providing an internal mandrel assembly having a mandrel shank, a mandrel ball assembly pivotally coupled to said mandrel shank, a socket formed within said mandrel ball assembly, a linking member having a free end and a substantially ball-shaped connecting end configured to reside within said socket such that said connecting end pivotally couples to said mandrel ball assembly, a wiper attached to said linking member proximate said free end, said wiper having a central mounting hole configured to slidably engage said linking member, and a locating rod attached to said mandrel shank;

inserting said internal mandrel assembly into said tube;

applying a lubricant to said interior surface of said tube;

performing a bending operation upon said tube while said interior surface is supported by said internal mandrel assembly;

advancing said tube relative to said internal mandrel assembly during said performing step; and

cleaning said interior of said tube with said wiper during said advancing step.

5,588,506

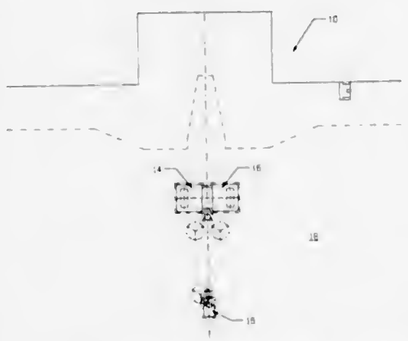
AIRCRAFT MAINTENANCE ELEVATOR SYSTEM

Ray W. Born, 4211 W. 1st St., Space 21, Santa Ana, Calif. 92704

Filed Jul. 14, 1994, Ser. No. 276,044

Int. Cl.[6] B66F *7/26*

U.S. Cl. 187—209 **10 Claims**



1. An aircraft maintenance elevator system comprising

a plurality of elevator platforms;

a plurality of electro-mechanical drive assemblies, each of said drive assemblies being coupled to and operable to selectively raise and lower a respective one of said elevator platforms and comprising:

a plurality of machine screw actuators attached to a respective one of said elevator platforms and mechanically synchronized to maintain the elevator platform level throughout the operational sequence thereof, and

at least two reversible electric drive motors having drive shafts which are mechanically coupled to said machine screw actuators;

wherein the rotation of the drive shafts in a first direction causes the machine screw actuators to raise the elevator platform and the rotation of the drive shafts in a second direction causes the machine screw actuators to lower the elevator platform;

a control device electrically connected to said drive assemblies, said control device being operational in a first mode wherein said elevator platforms may be raised and lowered independently of each other and a second mode wherein said elevator platforms may be simultaneously raised and lowered.

5,588,507

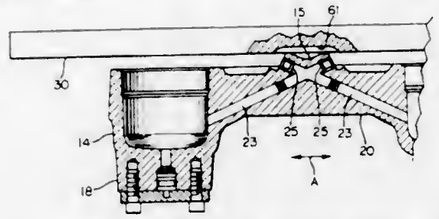
AIRCRAFT BRAKE ASSEMBLY PROVIDING ADDITIONAL WEARABLE FRICTION MATERIAL

George C. Beardsley, South Bend, Ind.; Brian K. Berk, St. Joseph, Mich.; Albert E. Kartman, South Bend, Ind.; Stanley W. May, Mishawaka, Ind.; Douglas J. Wise, South Bend, Ind., and Michael J. Zarembka, Granger, Ind., assignors to AlliedSignal, Inc., Morristown, N.J.

Filed Sep. 15, 1995, Ser. No. 529,260

Int. Cl.[6] F16D *55/24*

U.S. Cl. 188—71.5 **7 Claims**



1. An aircraft brake assembly with increased wearable friction material, comprising a torque tube connected with a piston housing, a heat stack comprising friction material stator discs connected with the torque tube and friction material rotor discs for connection with a wheel, and the piston housing including a plurality of pistons for direct engagement with an adjacent friction material stator disc and a piston housing axial extension extending from the piston housing toward the adjacent friction material stator disc, the adjacent friction material stator disc including a recess for receiving the axial extension of the piston housing, the recess comprising a radially extending surface bounded in section view by radially spaced-apart axially extending edges of the recess, whereby an overall axial length of the heat stack, as compared to an aircraft brake assembly having said axial extension and a heat stack including an adjacent friction material stator disc without said recess, is increased to provide additional wearable friction material.

5,588,508

DISK BRAKE USING A PULLED PAD WITH PERMANENT BEARING

Gerard Le Deit, Courtry, France, assignor to AlliedSignal Europe Services Technique, Drancy, France

PCT No. PCT/FR94/00175, § 371 Date Mar. 7, 1994, § 102(e) Date Mar. 7, 1994, PCT Pub. No. WO94/24454, PCT Pub. Date Oct. 27, 1994

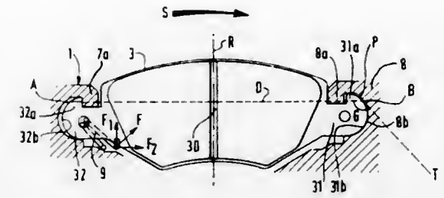
PCT Filed Feb. 17, 1994, Ser. No. 204,246

Claims priority, application France, Apr. 15, 1993, 93 04393

Int. Cl.[6] F16D *55/00*

U.S. Cl. 188—73.31 **8 Claims**

1. A disk brake for a motor vehicle, comprising: a first support which is fixed with respect to the vehicle, a second support shaped into a caliper and slidable with respect to said first support, one of said first and second supports constituting a pad support, first and second pads being held by said pad support so as to resist drive forces developed during a brake application, and a brake motor associated with said second support and capable of being actuated



so as to give rise to the application of said first and second pads onto a rotor by moving in a direction substantially perpendicular to the rotor, said first and second pads each having a central friction zone where a resultant of the drive forces is applied and first and second lateral ends, said first lateral end of at least one of said first and second pads end being offset with respect to said central friction zone in a direction of rotation of said rotor and at least said second lateral end of at least one of said first and second pads having a drive profile, each pad being supported by first and second housings, said second housing having a retaining profile interacting with said drive profile on said second lateral end of at least one of said first and second pads to define a fastening zone to retain each of said pads when each of said pads is stressed in the direction of rotation of the rotor by drive forces, and at least said first lateral end of each pad having an external contact surface suitable for abutting a beating zone in a corresponding internal contact surface of a first bearing surface located on said first housing, characterised in that each pad is stressed with respect to said first and second housings towards said beating zone by an elastic force having at least a first component pointing along the radius of the rotor which passes through said central friction zone, said first and second pads each having a relative freedom of rotation in a plane about said fastening zone and said internal and external contact surfaces together define in said bearing zone a tangent in a plane containing each pad and in that a straight line connecting said fastening zone to said beating zone defines, together with said tangent, an angle inside which said central friction zone is located, said angle being obtuse and less than a flat angle.

5,588,509

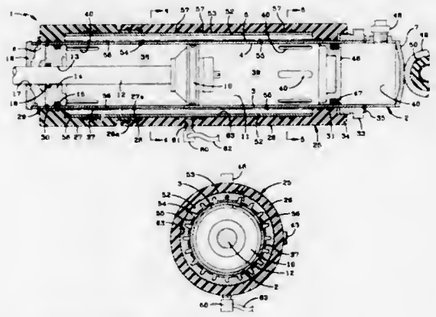
SPLINED VIBRATION DAMPING DEVICE USING ER FLUIDS

David A. Weitzenhof, Bath, Ohio; Isao Watanabe, Iruma, Japan; Carmen S. Santa Maria, Uniontown; William S. Niaura, Akron, both of Ohio, and Gareth H. McKinley, Ayer, Mass., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Oct. 17, 1995, Ser. No. 544,079

Int. Cl.[6] F16F *15/03*

U.S. Cl. 188—267 **17 Claims**



1. A vibrating damping device including:

a metal inner housing forming a piston chamber;

a piston axially movable within the piston chamber and dividing said chamber into two separate fluid chambers, said piston having a piston rod extending out of said inner housing;

an outer housing formed of a dielectric material surrounding at least a portion of the inner housing;

first means for connecting the piston rod to a first support structure;

second means for connecting one of the housings to a second structure spaced from the first structure, whereby a load on said damping device is supported by said one housing and the piston rod;

fluid transfer duct means formed between said inner and outer housings providing fluid communication between said fluid chambers on opposite sides of said piston, said fluid chambers adapted to be filled with an electrorheological (ER) fluid;

metal electrode means mounted in the outer housing and located adjacent the transfer duct means, said electrode means being formed with a plurality of circumferentially spaced splines and intervening grooves extending longitudinally along and adjacent an inner surface of the outer housing throughout at least a portion of the duct means; and

electrical connector means extending through the outer housing and electrically connected to the electrode means for applying the electric field across a portion of the duct means to increase the flow resistance of the ER fluid passing therethrough.

5,588,510

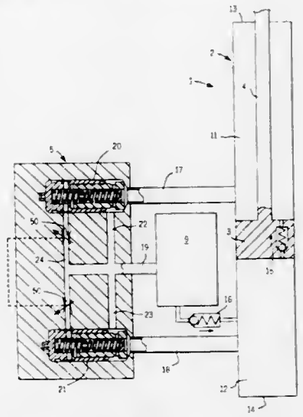
VARIABLE DAMPING FORCE SHOCK ABSORBER

Raud A. Wilke, Dousman, Wis., assignor to HUSCO International, Inc., Waukesha, Wis.

Filed Sep. 25, 1995, Ser. No. 533,234

Int. Cl.[6] F16F *9/46*

U.S. Cl. 188—299 **22 Claims**



1. A shock absorber for variably damping the transmission of forces between a body of a vehicle and a suspension member supporting a road wheel, the vehicle being of the type which has an apparatus for sensing one or more operating conditions and transmitting one or more control signals which are indicative of the operating conditions, the shock absorber comprising:

(a) a housing adapted for connection to one of the vehicle body and the suspension member and defining an internal space, and a piston adapted for connection to the other of the vehicle body and the suspension member and disposed within the internal space for dividing the internal space into a first working chamber and a second working chamber and for moving relative to the housing, the working chambers containing a working fluid;

(b) an assembly of a threshold valve and a main valve adapted to supplementarily control the flow of fluid from the first work-

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ing chamber to a receiving chamber, the threshold valve and the main valve having front sides subject to the pressure in the first working chamber and opposite back sides;

(c) a pilot fluid path from the front sides of the threshold and main valves to the back sides;

(d) a pilot circuit providing fluid communication from the pilot fluid path through a variable orifice to the receiving chamber;

(e) an orifice modifier adapted to vary the size of the variable orifice in the pilot circuit;

(f) a remotely controlled actuator adapted to operate the orifice modifier, the actuator being controlled by the one or more control signals;

(g) means for providing for a complete circuit of the fluid among the working chambers and the receiving chamber;

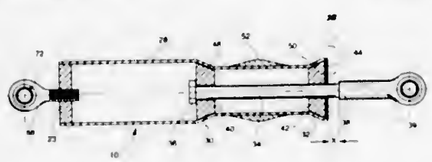
(h) whereby varying the cross sectional area of the variable orifice varies the pressure on the back sides of the threshold valve and the main valve and thereby varies the amount of pressure in the first working chamber needed to open the threshold valve and the main valve.

5,588,511

SEISMIC PIPE RESTRAINT AND METHOD FOR USING THE SAME

Ralph M. Kallenbach, Elgin, Ill., assignor to Sargent & Lundy, Chicago, Ill.

Filed May 15, 1995, Ser. No. 441,138
Int. Cl.[6] F16F *7/12*
U.S. Cl. 188—374 **15 Claims**



1. A load limiting device comprising:

a housing defining a generally cylindrical hollow portion and including a wall defining an inner surface, an outer surface and multiple diameters;

said wall including a first shoulder at a first location where the diameter of said wall changes and a second shoulder at a second location where the diameter of said wall changes;

a shaft at least partially received by said housing;

said shaft including a first wedge defining a first angled surface and a second wedge defining a second angled surface;

said first and second wedges received by said housing and movable within said housing;

one of said housing and said shaft being fixedly connected to an object subject to displacement relative to a support structure and the other of said housing and said shaft being connected to said support structure;

means, located between said first shoulder and said second shoulder, for resisting the movement of said first and second wedges in the region of said housing defined between said first shoulder and said second shoulder;

said resisting means having a first resistance in a first region adjacent said first shoulder, a second resistance in a second region adjacent said second shoulder and a third resistance in a third region between said first region and said second region, said third resistance being substantially greater than said first resistance and said second resistance; and

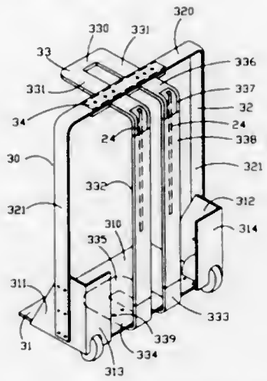
said first angled surface of said first wedge engaging said first shoulder and plastically deforming said wall once a predetermined amount of relative force has been imparted between said first wedge and said first shoulder and said second angled surface of said second wedge engaging said second shoulder and plastically deforming said wall once a predetermined amount of relative force has been imparted between said second wedge and said second shoulder.

5,588,512

INTERNAL FRAME FOR A WHEELED SUITCASE

Jerhong Lin, Suite 3, 9th Fl, #294, Tun Hwa S. Rd Section 1, Taipei, Taiwan

Filed Jan. 11, 1995, Ser. No. 371,401
Int. Cl.[6] A45C *5/14;13/04;13/26*
U.S. Cl. 190—115 **18 Claims**



1. A substantially rectangular internal frame for supporting a wheeled suitcase comprising:

(1) a base having a bottom panel, a left panel and a right panel, the lower ends of the left and right panels vertically connected to the left and right ends of the bottom panel separately;

(2) a U-shaped frame mounted on top of the base comprising a top panel and two side panels, the upper ends of the two side panels vertically connected to the left and right ends of the top panel, the lower ends of the two side panels mounted to the left and right panels of the base separately;

(3) a central frame comprising:

(a) a horizontal U-shaped member having two legs, and

(b) two vertical elongated supporting members, the top ends of the two supporting members connected to the two legs of the U-shaped member; and

(4) a rigid supporting plate; wherein the U-shaped member of the central frame is mounted to the approximately central part of the top panel of the U-shaped frame with the rigid supporting plate mounted in between for strengthening the structure of the central frame and also the connection between the U-shaped member and the top panel and each of the lower ends of the two vertical elongated supporting members of the central frame is mounted to the bottom panel of the base whereby the structure of the internal frame is greatly strengthened by the central frame.

5,588,513

TILT-LOCKING PULL HANDLE FOR A WHEELED SUITCASE

Jerhong Lin, 7548 Donegal Dr., Cupertino, Calif. 95014

Filed Mar. 7, 1995, Ser. No. 400,042
Int. Cl.[6] A45C *5/14;13/26*
U.S. Cl. 190—115 **2 Claims**

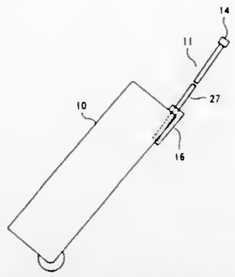
1. A wheeled suitcase comprising:

(1) a substantially rectangular body portion having a rear end and a rear bottom end;

(2) a plurality of wheels mounted on the rear bottom end of the body portion;

(3) a pull handle having a gripping means for gripping the pull handle and at least one elongated rod member connected to said gripping means;

(4) rod receiving means mounted on the rear end of the body portion for slidably receiving the rod member of said pull handle; said rod receiving means comprising an elongated



guiding track on its lower end for guiding said rod member and a head piece on its upper end fixedly connected to said guiding track for restricting said rod member at an utmost position within said guiding track wherein the lower part of said rod member is slidably engaged and restricted within said guiding track by said head piece; said guiding track comprising a U-shaped channel along its centerline and two protruding edges along two opposite ends of said U-shaped channel, each of said two protruding edges further comprising a plurality of fastening holes for fastening said head piece wherein said head piece is fastened to said fastening holes of said guiding track by a plurality of fasteners; and

(5) locking means installed in said rod receiving means for locking said rod member to prevent said rod member from moving downward when said rod member is extended to said utmost position within said rod receiving means and said wheeled suitcase is tilted toward its rear end by using said gripping means of the pull handle, and unlocking said rod member when said wheeled suitcase is repositioned to an upright position;

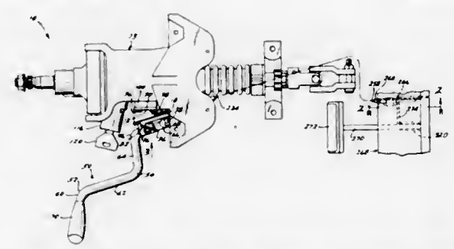
wherein said head piece further comprises a hooking means for hooking the top end of said guiding track wherein said head piece is fixedly connected to said guiding tracking by using said fasteners on its lower end and said hooking means on its upper end.

5,588,514

STEERING COLUMN MECHANICAL BRAKE INTERLOCK SYSTEM

William M. Snell, Grand Blanc, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed May 15, 1995, Ser. No. 442,246
Int. Cl.[6] B60K *41/26*
U.S. Cl. 192—4 A **4 Claims**



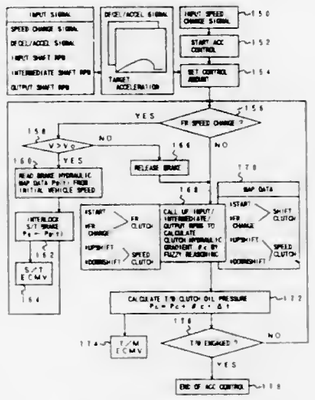
4. In a transmission shift control assembly including a detent plate having a plurality of detents formed thereon including a Park detent, a shift lever having an end thereof pivotable into and out of the Park detent and rotatable to selected detents, a pivotally mounted spring-loaded flip cam, a blocker member pivotally mounted on said detent plate, a linkage member operatively connected between said flip cam and said blocker member adapted to selectively pivot said blocker member into and out of engagement with the end of the shift lever while the shift lever is in the Park detent position, a brake lever and associated brake pedal, and a spring for urging the brake lever from a depressed state to an undepressed state, a mechanical brake interlock system comprising spring-loaded cable means operatively connected between an actuator assembly and said blocker member, said brake lever abutting against said actuator assembly to prevent said blocker member from being pivoted away from said end of said shift lever until said brake pedal is depressed and released from said actuator assembly, said actuator assembly including a bracket, an actuator member having first and second ends and pivotally mounted between said ends on said bracket, said cable means including a cable having one end secured to the first end of said actuator member, a second spring having one end secured to said actuator member and the other end secured to said bracket, and a link connected to the second end of said pivotally mounted actuator member, said bracket lever serving when said brake pedal is not depressed to abut against said link to thereby pivot said actuator member against the force of said second spring to pull on said cable and in turn, pivot said blocker member.

5,588,515

METHOD OF AND APPARATUS FOR SPEED CHANGE CONTROL

Makoto Toyama, and Yoshikazu Asai, both of Ishikawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP93/01289, § 371 Date Mar. 10, 1995, § 102(e) Date Mar. 10, 1995, PCT Pub. No. WO94/05523, PCT Pub. Date Mar. 17, 1994
PCT Filed Sep. 10, 1993, Ser. No. 397,206
Claims priority, application Japan, Sep. 10, 1992, 4-268082
Int. Cl.[6] B60K *41/26*
U.S. Cl. 192—4 C **16 Claims**



1. A speed change control method for engaging and disengaging a plurality of clutches of a transmission of a vehicle to change a gear ratio of the transmission so as to change a rotational speed of an output shaft of the transmission and for effecting a shift between forward travel and reverse travel of said vehicle, said method comprising the steps of:

storing braking data representing braking forces which are predetermined for particular rotational speeds of said output shaft;

storing deceleration/acceleration data representing a target deceleration/acceleration curve wherein a torque of said output shaft changes smoothly with time;

providing a signal directing a shify between forward travel and reverse travel of said vehicle;

detecting the rotational speed of said output shaft when said signal is provided:

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selecting from the thus stored braking data a braking force in accordance with the thus detected rotational speed of said output shaft;

applying, in response to a providing of said signal directing a shift between forward travel and reverse travel, the thus selected braking force to said output shaft to effect a braking torque on said output shaft;

engaging a predetermined clutch among said plurality of clutches in response to a providing of said signal directing a shift between forward travel and reverse travel;

increasing the thus applied braking force until a speed of said vehicle is reduced to a predetermined value, and

then gradually decreasing the thus applied braking force to zero while gradually increasing an engagement of said predetermined clutch so as to cause a deceleration/acceleration of the vehicle given through said output shaft to smoothly change along said target deceleration/acceleration curve to thereby decrease shock to the vehicle upon a completion of the engagement of said predetermined clutch.

5,588,516

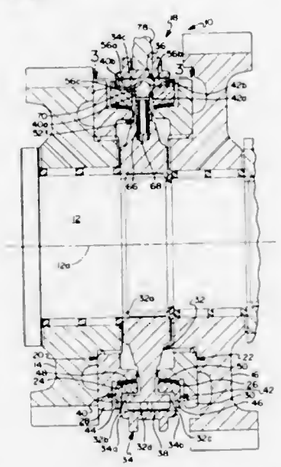
SYNCHRONIZER WITH SELF-ENERGIZING

Eugene R. Braun, Royal Oak, and Otis J. Olson, Farmington Hills, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 408,453, Mar. 22, 1995, abandoned, which is a continuation of Ser. No. 172,789, Dec. 27, 1993, abandoned. This application May 23, 1995, Ser. No. 448,158

Int. Cl.[6] F16D *23/08;* **F16H** *3/38*

U.S. Cl. 192—48.91 **19 Claims**



1. A clutch mechanism for frictionally synchronizing and positive connecting first and second drive members disposed for relative rotation about a common axis; the clutch mechanism including:

first drive means including a plurality of circumferentially spaced apart first drive teeth and a first drive friction surface affixed to the first drive member;

a hub affixed to the second drive member and including an outer circumference and first and second axially oppositely facing ends, the outer circumference including a plurality of first grooves defined by flank surfaces of circumferentially spaced apart external splines;

a first baulkring axially interposed between the hub and the first drive means and axially movable therebetween, the baulkring including circumferentially spaced apart angled blocker surfaces axially facing in the direction of the hub, the baulkring including a friction surface engageable with the first drive friction surface for producing a synchronizing torque, and the baulkring including abutment means for limiting rotation of the baulkring relative to the hub;

a shift sleeve having an inner circumference and an axial length defined between first and second axially facing ends thereof, the inner circumference including a plurality of circumferentially spaced apart first teeth axially movable from a neutral position disposed in the first grooves to engaged positions with the first drive teeth in response to an axially directed shift force ($+F_o$) acting on the sleeve, the sleeve first teeth in the direction of the baulkring including ends at the sleeve first end having angled blocker surfaces;

pre-energizer means operative in response to initial axial movement of the sleeve from the neutral position to move the baulkring friction surface into engagement with the first drive friction surface for rotating the baulkring angled blocker surfaces to positions engaged by the sleeve first teeth angled blocker surfaces for blocking asynchronous engagement of the first drive teeth and sleeve first teeth, for transmitting the shift force ($+F_o$) across the engaged blocker surfaces to effect an increased engagement force of the baulkring friction surface with the first drive friction surface, and for producing via the angled blocker surfaces a torque counter to the synchronizing torque for moving the baulkring and sleeve first teeth angled blocker surfaces out of engagement as synchronization is reached;

self-energizing means including first angled self-energizing surfaces affixed to the sleeve and hub and movable into engagement in response to engagement of the blocker surfaces and relative rotation between the sleeve and hub, the angled self-energizing surfaces positioned oblique to a plane normal to the axis and operative when engaged to react to the synchronizing torque for producing an additive axial force ($+F_a$) transmitted across the blocker surfaces in the direction of the shift force ($+F_o$) for further increasing the engagement force of the friction surfaces; the improvement comprising:

the sleeve first teeth having a length less than the sleeve length and extending axially from the sleeve first end toward the sleeve second end, the sleeve inner circumference including a plurality of circumferentially spaced apart second teeth extending axially from the sleeve second end toward the sleeve first end, adjacent pairs of the first and second teeth having a combined length less than or equal to the axial length of the sleeve;

the hub including a plurality of second grooves defined by flank surfaces of the splines and alternately spaced between the first grooves and slidably receiving the sleeve second teeth, the flank surfaces of axially extending portions of the first and second grooves respectively having at least a portion of the sleeve first and second teeth disposed therein during the neutral position and the engaged position of the blocker surfaces, the flank surfaces of the axially extending portions having a circumferential spacing relative to the teeth therein for allowing the relative rotation between the sleeve and hub to effect engagement of the self-energizing means, and the flank surfaces of another axially extending portion of the second grooves closely receiving the sleeve second teeth when the first drive and sleeve first teeth are engaged for preventing relative rotation therebetween.

5,588,517

CLUTCH OPERATING APPARATUS

Ad Kooy, Lauf; Helmar Bier, Ettlingen, and Norbert Mebus, Bühlertal, all of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Bühl, Germany

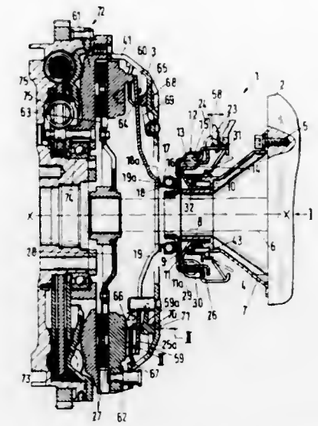
Filed Sep. 13, 1994, Ser. No. 305,519

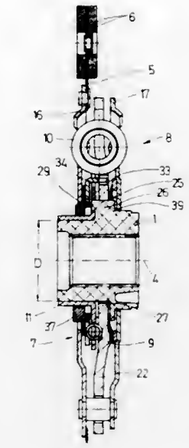
Claims priority, application Germany, Sep. 13, 1993, 43 30 886.4; May 25, 1994, 44 18 023.3

Int. Cl.[6] F16D *13/54*

U.S. Cl. 192—70.25 **45 Claims**

1. Apparatus for operating a clutch, particularly a friction clutch located between a prime mover and a transmission, said clutch having operating means rotatable about a predetermined axis and movable in the direction of said axis between first and second





positions in which the clutch is respectively engaged and disengaged and said operating means being moved in the direction of said axis as a result of progressing wear upon at least one component of the clutch, comprising:

a bearing including a rotary portion movable in the direction of said axis to move said operating means from one to the other of said positions;

a carrier;

at least one support mounted on said carrier;

an actuator mounted on said at least one support for rotation about said axis relative to said at least one support and for movement relative to said carrier in the direction of said axis to thus move said operating means from one to the other of said positions by way of said bearing;

means for moving said actuator relative to said at least one support in the direction of said axis in response to rotation of said actuator relative to said at least one support; and

means for at least partially compensating for said wear, including means for moving said bearing in the direction of said axis relative to said carrier.

5,588,518

CLUTCH DISC WITH A REINFORCED HUB

Reinhard Feldhaus, Ebenhausen, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Mar. 8, 1995, Ser. No. 400,365

Claims priority, application Germany, Mar. 9, 1994, 44 07 766.1

Int. Cl.[6] F16D *13/68;3/12*

U.S. Cl. 192—204 **19 Claims**

1. Clutch disc for a motor vehicle clutch, said clutch disc comprising:

a first cover plate;

a second cover plate;

means for substantially fixedly connecting said first and second cover plates with respect to one another;

a hub;

said hub having means for connecting with a transmission of a motor vehicle;

said hub being being oriented concentrically about a rotational axis;

said hub having a length;

the length of said hub being defined generally parallel with the rotational axis;

said hub comprising an inner surface;

said hub comprising an outer peripheral surface;

said outer peripheral surface being disposed substantially further away from the rotational axis than said inner surface;

said outer peripheral having a length;

the length of said outer peripheral surface being defined generally parallel to the rotational axis;

the length of said outer peripheral surface being substantially similar to the length of said hub;

torsional damper means for damping torsional vibrations;

said torsional damper means comprising:

an input portion;

an output portion; and

means for transmitting a torsional force from said input portion to said output portion;

means for stiffening said hub so as to inhibit plastic deformation of said hub;

said stiffening means comprising at least one stiffening portion, said at least one stiffening portion comprising at least a portion of at least one of said input portion and said output portion of said torsional damper means; and

said at least one stiffening portion being oriented generally parallel with respect to the rotational axis of said hub;

said at least one stiffening portion comprising at least one essentially tubular member; and

said at least one essentially tubular member being in contact with said outer peripheral surface over a substantial portion of the length of said outer peripheral surface.

5,588,519

Patent Not Issued For This Number

5,588,520

CROSSBELT SORTATION SYSTEM

Artemio Affaticati, Cadeo; Claudio Cerutti, Borgomanero, and Teodoro Ceglia, Turin, all of Italy, assignors to Rapistan Demag Corp., Grand Rapids, Mich.

Continuation of Ser. No. 300,968, Sep. 6, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 606,547

Int. Cl.[6] B65G *47/46*

U.S. Cl. 198—370.06 **63 Claims**

1. A method of conveying parcels on a plurality of transport units moving in a conveying path between an induction station and a discharge station, each transport unit having a driven carrier belt thereon which is moveable orthogonally to the conveying path, said induction station having at least one induction belt extending at an angle to the conveying path, said discharge station having a plurality of receiving ports positioned along said conveying path, including:

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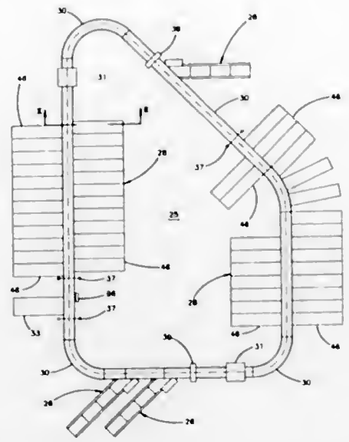


determining the length of parcels at said induction station;

for parcels having a length less than a given length operating said at least one induction belt and said carrier belt of one of said transport units to position a parcel on said one of said transport units; and

for parcels having a length greater than said given length operating said at least one induction belt and said carrier belts of at least two contiguous transport units in order to position a parcel on said at least two transport units.

5,588,521

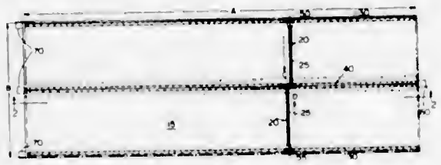
METHOD AND APPARATUS FOR MATERIAL HANDLING

Jon Laidig; Dale Updike, and Alan Amick, all of St. Joseph County, Ind., assignors to Laidig, Inc., Mishawaha, Ind.

Filed Jun. 5, 1995, Ser. No. 463,766

Int. Cl.[6] B65G *47/19*

U.S. Cl. 198—532 **10 Claims**



1. An apparatus for controlling the flow of particulate, granular or fluidized matter between a storage receptacle and a conveyor, that apparatus being disposed between said receptacle and said conveyor and comprising:

a plurality of individually movable flow gates, each of which defines an opening between said receptacle and said conveyor, and

a cam member sequentially engagable with said flow gates to selectively open and close said flow gates to permit said matter to move between said receptacle and said conveyor.

5,588,522

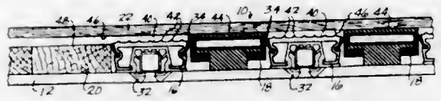
RECIPROCATING FLOOR CONVEYOR FOR CONVEYING PALLETIZED LOADS OR THE LIKE

Raymond K. Foster, and Randall M. Foster, both of Madras, Oreg., assignors to Raymond Keith Foster, Madras, Oreg.

Filed Oct. 24, 1994, Ser. No. 327,630

Int. Cl.[6] B65B *25/00*

U.S. Cl. 198—775 **20 Claims**



1. A reciprocating floor conveyor for conveying articles having fixed-form wide bases, comprising:

a support frame;

a plurality of laterally spaced-apart conveyor slats mounted on the support frame for longitudinal reciprocation between a start position and an advanced position, the conveyor slats having upper surface portions with a constant vertical height that defines a horizontal conveying plane;

a plurality of laterally spaced-apart holding slats mounted on the frame for vertical movement between an up position in which the upper surfaces of the holding slats are above the conveying plane defined by the conveyor slats and the articles are supported by the holding slats, and a down position in which the upper surfaces of the holding slats are below the conveying plane and the articles are supported by the conveyor slats; each holding slat including a top, two laterally spaced sides extending downwardly from the top, and two bottom flanges, one extending laterally from a bottom portion of each side;

the conveyor slats and the holding slats being distributed across the conveyor in a pattern resulting in both conveyor slats and holding slats being below each article on the conveyor;

a holding slat base for each holding slat, each holding slat base having opposite laterally extending flanges positioned between the bottom flanges and the top of the corresponding holding slat to limit vertical movement of the holding slat; wherein a collapsible pocket is formed vertically between the holding slat and its base; and

an expandable member located in each collapsible pocket, wherein expansion of the expandable members raises the holding slats from their down position to their up position to lift any articles on the conveyor up off the conveyor slats to permit the conveyor slats to be retracted from their advanced position to their start position while the conveyor slats are out of contact with the articles.

5,588,523

ROLLER DRIVING DEVICE

Shoji Hara; Takenori Yanai, both of Kounan, and Kazuhiro Ishikawa, Inuyama, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 7, 1994, Ser. No. 350,531

Claims priority, application Japan, Dec. 10, 1993, 5-341480

Int. Cl.[6] B65G *13/06*

U.S. Cl. 198—781.08 **4 Claims**

1. A roller driving device comprising:

a base frame;

a carrier roller mounted in said base frame for rotation about a central axis;

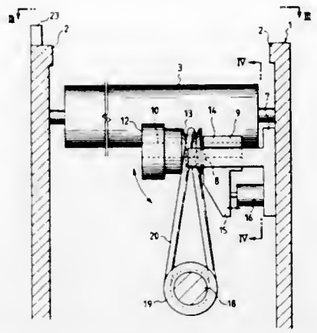
a driving rotation shaft disposed below said carrier roller;

a bearing member disposed beneath said carrier roller;

a pivot shaft disposed perpendicularly with respect to said central axis of said carrier roller and mounting said bearing member for pivotal movement;

a transmission roller and a wheel concentric thereto rotatably carried by said bearing member on one side of said pivot shaft;

a brake shoe carried by said bearing member on the other side of said pivot



a an endless belt extending around said wheel and the driving rotation shaft for rotating said transmission roller; and

means for pivoting said bearing member about said pivot shaft to place either said transmission roller or said brake shoe alternatively in contact with said carrier roll.

5,588,524

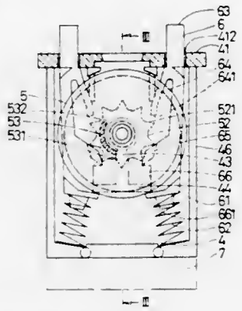
PUSH WHEEL SWITCH

Ching-Lung Wu, P.O. Box No. 2103, Taichung City, Taiwan

Filed Oct. 6, 1995, Ser. No. 540,553

Int. Cl.[6] H01H *13/00*

U.S. Cl. 200—552 **4 Claims**



1. A push wheel switch comprising:

a housing having a cavity open on one end formed by a bottom wall extending between a pair of longitudinally directed side walls and first and second end walls;

said first end wall having a pair of push button holes formed therethrough and a display window disposed between said pair of push button holes;

a circuit board positioned over said housing open end and forming a closure therefor;

an inner shaft seat extending from said housing bottom wall into said cavity, said inner shaft seat having attached thereto a longitudinally directed first stopper block, said first stopper block having a distal end to which is attached a pair of oppositely directed second stopper blocks, each of said pair of second stopper blocks being directed in a direction transverse said first stopper block;

a toothed wheel disposed within said cavity and having a shaft hole formed therethrough for rotatable coupling about said shaft seat, said toothed wheel having an outer peripheral surface defining a numeral face for displaying a predetermined number of display numerals through said display window, said toothed wheel having a predetermined number of peripheral tooth spaces, each of said peripheral tooth spaces being formed by a pair of opposing tooth faces;

an arch-shaped block integrally formed on said toothed wheel for establishing a rotational interval between a predetermined pair of said display numerals, said arch-shaped block being disposed concentrically between said shaft hole and said tooth spaces, said arch-shaped block including a start end and a finish end, each of said start and finish ends being adapted for rotational restriction by said first stopper block, so that said toothed wheel can rotate only between said predetermined pair of said display numerals; and,

a pair of longitudinally directed push buttons disposed within said cavity and respectively positioned proximate to said housing side walls, each of said push buttons having an upper end and an opposing base seat end, said base seat end being biased by a respective spring for urging said respective upper end to protrude by a predetermined distance through a respective one of said push button holes and to press against a respective one of said pair of second stopper blocks, each of said push buttons having a wheel driving arm inclined toward the tooth spaces of the toothed wheel, said wheel driving arm being provided with a bottom end for pushing a respective tooth face of said toothed wheel, each of said push buttons having a lower locating block, each said lower locating block extending into respective lower tooth spaces on opposing sides of said toothed wheel, each driving arm being displaced to contact a respective tooth face of said toothed wheel responsive to a corresponding displacement of a respective push button, said displaced driving arm being adapted to transmit a force to said contacted tooth face at a predetermined angle with respect to said contacted tooth face for (1) rotatively displacing said toothed wheel when said rotative displacement is unrestricted by said first stopper block, and (2) slipping off an outer edge of said contacted tooth face when said rotative displacement of said toothed wheel is restricted by said first stopper block.

5,588,525

CONTAINER FOR ANNULAR WORKPIECE

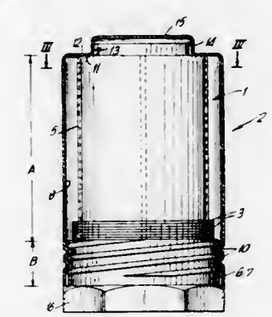
Peter Rösler, Wangen, Germany, assignor to Rose-Plastic GmbH, Hergensweiler, Germany

Filed Feb. 8, 1996, Ser. No. 598,458

Claims priority, application Germany, Feb. 13, 1995, 295 02 288.4

Int. Cl.[6] B65D *85/02*

U.S. Cl. 206—303 **12 Claims**



1. A container for storing annular workpieces having a slot across a circumference thereof, said container comprising:

an inner core part having a first length section formed as a smooth cylindrical body having a rib extending parallel to a container axis substantially along an entire longitudinal extent of the first section for engagement in slots of the stored annular workpieces, and a second length section adjoining the first length section and formed as a substantially cylindrical body having a diameter larger than a diameter of the smooth cylindrical body forming the first section; and

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an outer jacket part having an inner circumferential surface spaced from an outer circumferential surface of the smooth cylindrical body forming the first section and adjoining an outer circumferential surface of the cylindrical body forming the second section.

5,588,526

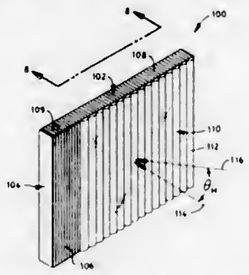
FLAT BOX SYSTEM WITH MULTIPLE VIEW OPTICS

Stephen D. Fantone, Lynnfield, Mass.; Anthony L. Gelardi, Cape Porpoise, and John A. Gelardi, Kennebunkport, both of Me., assignors to Insight, Inc., Lynnfield, Mass.

Continuation-in-part of Ser. No. 222,632, Apr. 1, 1994. This application Nov. 14, 1994, Ser. No. 338,246

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—308.1 **38 Claims**



1. A box system for containing at least one flat object and providing visual information about the flat object, said box system comprising:

a multisided flat box comprising a pair of opposed flat walls interconnected by a plurality of shallow side walls to provide an interior chamber for the flat object, said pair of opposed flat walls and said plurality of shallow side walls being joined to releasably receive the flat object, at least one of said pair of opposed flat walls having a transparent lenticulated section composed of a plurality of parallel lenticules having a focal plane optically associated therewith;

a compliant insert bearing at least two interlaced preprinted images, said compliant insert being removably insertable into said interior chamber and located in a plane substantially parallel and proximate to said transparent lenticulated section so that said interlaced preprinted images are in optical registration therewith, said compliant insert being further located substantially in said focal plane of said transparent lenticulated section to provide different information to an observer looking at said transparent lenticulated section from different angular perspectives.

5,588,527

STORAGE CONTAINER WITH INTEGRAL FLAP

Ross O. Youngs, Dublin, Ohio, assignor to Univenture, Inc., Dublin, Ohio

Continuation of Ser. No. 276,055, Jul. 15, 1994, Pat. No. 5,462,160, which is a continuation of Ser. No. 998,957, Dec. 31, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,724

Int. Cl.[6] B65D *85/30;85/57*

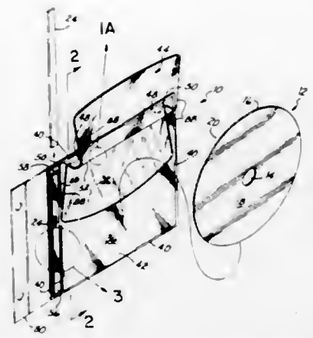
U.S. Cl. 206—308.1 **4 Claims**

1. A storage container for storing a compact disc having an aperture and an edge, said storage container comprising:

a first flexible sheet;

a nonwoven fabric sheet overlaying said first flexible sheet;

a second flexible sheet overlaying said nonwoven fabric sheet opposite said first flexible sheet and joined to said first flexible sheet through said nonwoven fabric sheet to define a compact



disc storage area for holding said compact disc, said second flexible sheet having a cut to define a flap portion which hinges along a hinge line and opens along an opening line to allow access to said compact disc storage area, wherein said flap portion extends from said hinge line at least to an approximate center point of said compact disc storage area to overlie at least a portion of the aperture of said compact disc when said compact disc is fully received in said compact disc storage area thereby permitting simultaneous access to both the edge and aperture of said compact disc upon opening of said flap portion;

a binding strip along one edge of said container including binding structure for enabling a plurality of said storage containers to be bound together;

an elongate graphics storage pocket disposed between said compact disc storage area and said binding strip.

5,588,528

OPTICAL RECORDING DISC STORING DEVICE

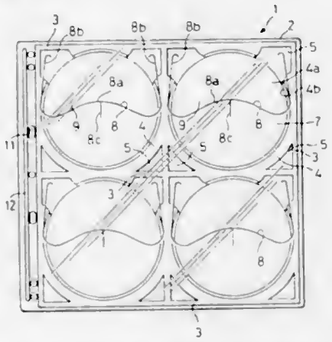
Jiro Ozeki, Toshima-ku, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Apr. 16, 1996, Ser. No. 632,833

Claims priority, application Japan, Sep. 29, 1995, 7-252125

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—308.1 **11 Claims**



1. An optical recording disc storing device which comprises:

a sheet-like storing element having at least one rectangular frame formed on at least one side thereof and a circular frame formed in said rectangular frame which surrounds a circular bottom area, at least a portion of said circular area being cutout to form a cutout opening, said circular frame being cut-off at a position adjacent to at least-one of four corners of said rectangular frame;

a film of a flexible material attached to said storing element at said one side to cover said area surrounded by said circular frame;

said circular frame of said storing element having an inner diameter which is larger than outer diameter of a recording disc which is to be stored in said circular frame, said circular frame having an inner periphery slanted radially inwardly to provide a slanted surface for receiving peripheral edge portion of the recording disc to support the disc with a clearance against said bottom area surrounded by said circular frame;

said film of the flexible material being formed with a slit along a split line extending in a direction crossing said circular frame so that said film can be turned over at one side of said split line to have an access by fingers to the edge portion of the recording disc stored in said circular frame to take out the recording disc.

5,588,529

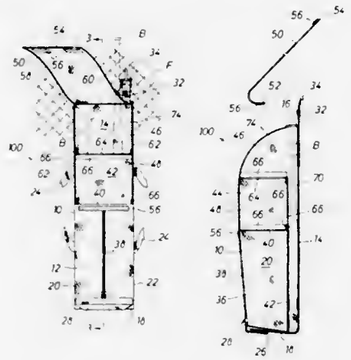
BASEBALL/SOFTBALL EQUIPMENT BAG

Michael W. Speck, 6624 Wanita, Houston, Tex. 77007

Continuation of Ser. No. 247,327, May 23, 1994, abandoned. This application Sep. 1, 1995, Ser. No. 522,542

Int. Cl.[6] B65D *85/20*

U.S. Cl. 206—315.1 **5 Claims**



1. A hanging baseball equipment bag comprising:

a flexible, elongated bag having a length, a top end and a bottom end, a front, a back, a left side and a right side, said elongated bag being non-rigid in a direction between said top and bottom ends;

fence clips for vertically hanging said elongated bag from a chain link fence;

a substantially planar and rigid interior shelf substantially medially positioned between said top and bottom ends within said flexible, elongated bag, said interior shelf is substantially horizontal when said flexible, elongated bag vertically hangs from said fence clips in a substantially vertical position;

a flexible interior rear panel attached to the interior of said flexible, elongated bag and oriented substantially parallel to said back, said interior rear panel dividing said flexible, elongated bag into a front compartment extending substantially the length of said elongated bag and a rear compartment extending substantially the length of said elongated bag, said front compartment divided into an upper front compartment and a lower front compartment by said interior shelf,

wherein said front compartment is located between said front and said interior rear panel and said rear compartment is located between said back and said interior rear panel; and

means for accessing said front compartment and said rear compartment in said front and said top end.

5,588,530

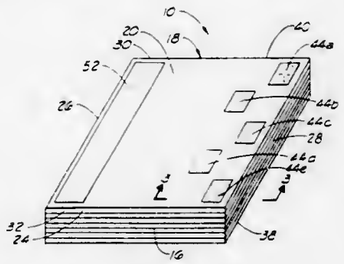
WRAPPING MATERIAL FOR WRAPPING A FLORAL GROUPING HAVING STAGGERED STRIPS OF ADHESIVE MATERIAL APPLIED THERETO AND METHOD

Donald E. Weder, Highland, Ill., and Franklin J. Craig, Valley Park, Mo., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned. This application May 16, 1994, Ser. No. 243,339

Int. Cl.[6] B41L *1/32;* **B65D** *5/02;* **B65B** *25/14*

U.S. Cl. 206—451 **7 Claims**



1. A pad of wrapping material, comprising:

a plurality of sheets of material stacked one on top of the other to form the pad, each sheet of material having an upper surface, a lower surface and a strip of adhesive disposed on one of the upper and lower surfaces such that each sheet of material is releasably connected to an adjacent sheet of material via the strip of adhesive, the strips of adhesive arranged on the sheets of material in alternating vertical alignment such that each sheet of material is disposed substantially parallel to the adjacently disposed sheet of material.

5,588,531

GLASS SUBSTRATE TRANSPORT BOX

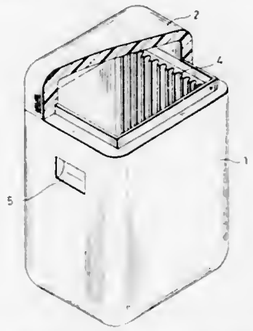
Toshio Yoshida, Osaka, and Toshio Akai, Kyoto, both of Japan, assignors to Yodogawa Kasei Kabushiki Kaisha, and Sharp Kabushiki Kaisha, both of Osaka, Japan

Filed Nov. 8, 1994, Ser. No. 337,424

Claims priority, application Japan, Nov. 9, 1993, 5-304668

Int. Cl.[6] B65D *85/48*

U.S. Cl. 206—454 **2 Claims**



1. In a glass substrate transport box comprising either (A) a generally rectangular, bottomed body and a lid or (B) a generally

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rectangular, unbottomed body, a lid and a bottom member, said bottomed or unbottomed body having grooves on at least one pair of its opposed inner walls for supporting glass substrates, the improvement wherein

each of said body, lid and bottom member is a molded piece of polyolefin foam with a foaming ratio of 4–25 as a whole,

inner and outer sides of the wall of said body, lid and bottom member have a dense skin layer relative to the interior portion of the wall, where a relative density of the skin layer down to a depth of 1 mm from the surface is at least 2 times as great as the interior portion density of the wall, and

said polyolefin foams are those obtained by filling metal mold with polyolefin beads containing a blowing agent or a primary foam obtained from such beads and heating the mold.

5,588,532

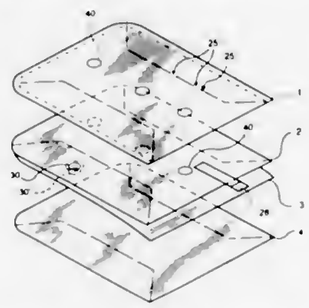
SELF-SEALING INFLATABLE BAG AND METHOD FOR PACKAGING AN ARTICLE THEREIN

Daniel A. Pharo, Valencia, Calif., assignor to Air Packaging Technologies, Inc., Del.

Filed Sep. 15, 1994, Ser. No. 306,883

Int. Cl.[6] B65D *81/02*

U.S. Cl. 206—522 **12 Claims**



1. A inflatable package adapted to be formed into a packaging system for retaining an item therein comprising:

a pair of overlying inner panels defining an item-receiving zone therebetween to have an item retained therein;

a pair of outer panels each overlying a respective one of said inner panels, each said outer panel being associated with a different one of said inner panels to form an inflatable chamber therebetween;

securing means for securing overlying edge portions of each respective pair of said inner and outer panels together along all overlying edge portions of each respective pair of said inner and outer panels and for securing overlying edge portions of said inner panels together along at least two substantially parallel edge portions of said inner panels so that said inner panels remain unattached to each other along at least one section of the overlying edge portions of said inner panels to allow insertion of said item into said item-receiving zone;

inflating means for at least partially inflating said inflatable chambers with a filler medium;

wherein said inflatable chambers are divided into a plurality of sections by bonding each respective pair of said inner and outer panels along an interior portion of each respective pair of said inner and outer panels, so that the bonding between each respective pair of said inner and outer panels is not uniform and complete, the filling medium can pass between adjacent sections, the bonding is not co-extensive with said two substantially parallel edge portions of said inner panels, and there is a portion of each of said inflatable chambers which is shaped to substantially enclose said item-receiving zone upon inflation;

said filling medium communicates between said inflatable chambers through said inner panels via respective holes in said inner panels, said inner panels being bonded together around said holes;

said inflatable chambers are sealed upon inflation by inflation pressure acting upon said inflating means; and

said item-receiving zone is automatically sealed upon inflation of said inflatable chambers to retain said item therein.

5,588,533

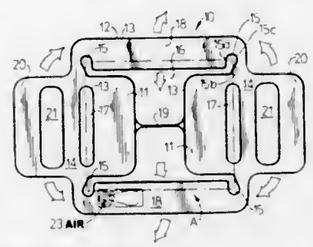
INFLATABLE PACKAGING CUSHION

Brian K. Farison, New Milford, and William R. Armstrong, Newtown, both of Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Dec. 1, 1995, Ser. No. 565,664

Int. Cl.[6] B65D *81/02*

U.S. Cl. 206—522 **11 Claims**



1. An inflatable packaging cushion of flexible material adapted to be at least partially charged with filler medium and having an external peripheral edge adapted to the shape and dimensions of a packaging receptacle comprising:

said cushion having at least one internal opening capable of receiving an article to be packaged such that the sides of said article are completely encircled a pair of inflatable end chambers interconnected with a pair of inflatable side chambers via passageways;

a pair of inflatable bottom panels interconnected to each of said end panels and at least one tie strap located in said internal opening connecting said bottom panels so as to maintain them in position when said cushion is inflated;

a plurality of recesses extending from said internal opening toward the peripheral edges of said recesses delimiting wedging parts as portion of said side chambers, said wedging parts capable of coming into contact with the sides of said article, zones for pivoting of the wedging parts being defined between the recesses and the peripheral edge,

said wedging parts being adapted so as to automatically pivot during inflation of the inflatable packaging cushion about a line extending generally between two successive recesses in order to vary the size and shape of each internal opening, said internal opening being completely encircled by said wedging parts;

at least one internal opening between each of said bottom panels and said end chambers to facilitate said cushion extending around the bottom ends of said article; and

filling means for at least partially charging said cushion with filler medium.

9. An inflatable packaging cushion of flexible thermoplastic material adapted to be at least partially charged with air and having an external peripheral edge adapted to the shape and dimensions of a packaging receptacle comprising:

said cushion having a pair of juxtaposed thermoplastic sheets having the outer peripheral edges thereof sealed together to form said cushion and having at least one internal opening capable of receiving an article to be packaged such that the sides of said article are completely encircled a pair of inflatable end chambers interconnected with a pair of inflatable side chambers via passageways;

a pair of inflatable bottom panels interconnected to each of said end panels and at least one tie strap located in said internal opening connecting said bottom panels so as to maintain them in position when said cushion is inflated;

a plurality of recesses extending from said internal opening toward the peripheral edges of said recesses delimiting wedging parts as portion of said side chambers, said wedging parts capable of coming into contact with the sides of said article, zones for pivoting of the wedging parts being defined between the recesses and the peripheral edge,

said wedging parts being adapted so as to automatically pivot during inflation of the inflatable packaging cushion about a line extending generally between two successive recesses in order to vary the size and shape of each internal opening, said internal opening being completely encircled by said wedging parts;

at least one internal opening between each of said bottom panels and said end chambers to facilitate said cushion extending around the bottom ends of said article;

at least on internal opening between each of said bottom panels and said end panels;

at least one inflatable top chamber interconnected to said end chamber and having at least one internal opening between said at least one top chamber and said end chamber; and

a single self-sealing inflation valve for at least partially charging said cushion with air.

5,588,534

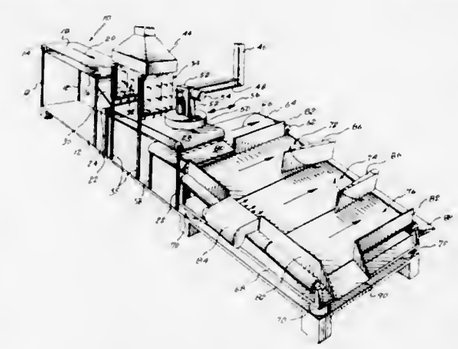
GARBAGE SEPARATOR SYSTEM

Denis Harel, 2160 Blvd. Lafleche, Baie Comeau, Quebec, Canada

Filed Sep. 30, 1994, Ser. No. 315,441

Int. Cl.[6] B07C *5/02*

U.S. Cl. 209—3.1 **11 Claims**



1. A garbage separating apparatus comprising at least first and second conveyors, each of said conveyors having an input end and a discharge end, said conveyors being arranged such that material discharged from a side of said first conveyor will be deposited on said second conveyor, each conveyor being tilted with respect to the horizontal in a direction substantially normal to the direction of conveyor operation, vibrating means operatively associated with each of said conveyors to impart a vibratory movement thereto, and means for feeding material to the input end of said first conveyor.

5,588,535

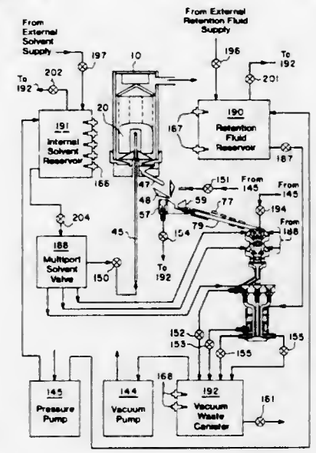
SAMPLE PREPARATION SYSTEM FOR SEPARATING WEAR PARTICLES BY SIZE AND MAGNETIC CHARACTERISTICS

Michael G. Thornton, and Janine M. Thornton, both of Littleton, Colo., assignors to Synectic Technology, Inc., Littleton, Colo.

Filed Oct. 12, 1994, Ser. No. 322,185

Int. Cl.[6] B03C *1/30*

U.S. Cl. 209—38 **20 Claims**



1. A system for preparing samples of wear particles comprising:

a filter;

a housing having a passage with an inlet for receiving a flow of wear particles suspended in a fluid and an outlet;

at least one particle trap having openings for retaining wear particles larger than a predetermined size and for passing fluid and wear particles smaller than said size, with mounting means for selectively moving said particle trap between a first position in which said particle trap substantially blocks said housing passage while said flow of wear particles and fluid is introduced into said inlet, and a second position in which said passage is substantially unblocked by said particle trap;

means for rinsing wear particles from said particle trap in said second position; and

means for selectively directing said flow from said outlet of said housing onto at least a first sample portion of said filter when said particle trap is in said first position, and onto at least a second sample portion of said filter when said particle trap is in said second position.

5,588,536

DREDGE WITH BI-DIRECTIONAL GRIZZLY

Jochen Rohr, 1 Field La., Cincinnati, Ohio 45208

Filed Mar. 13, 1995, Ser. No. 404,176

Int. Cl.[6] B07B *1/52;* **B65G** *45/00*

U.S. Cl. 209—385 **19 Claims**

1. A system for separating recoverable material from waste material, said system comprising:

a stationary sieve for straining a portion of material deposited thereon;

a first and a second rake, said first and second rakes being movable and initially positioned at first and second spaced ends of said sieve, respectively; and

a driver assembly connected to said first and second rakes to selectively move said first and second rakes across said sieve in first and second directions, said driver assembly selectively moving said first rake in said first direction to slide waste deposited on said sieve off of said sieve for disposal, said

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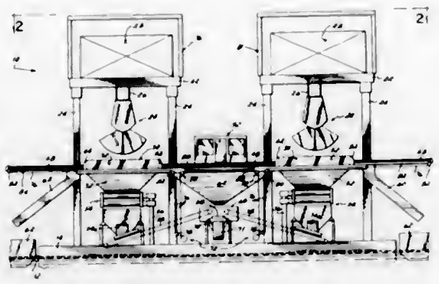
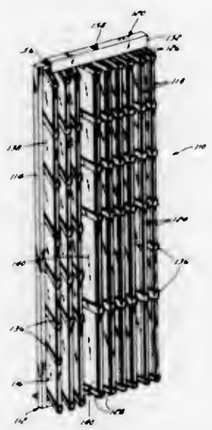


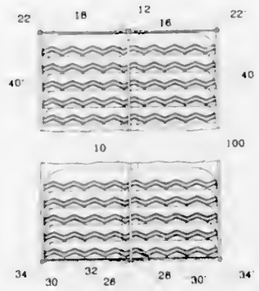
driver assembly also selectively moving said second rake in said second direction to slide recoverable material deposited on said sieve off of said sieve for processing.

5,588,537
MERCHANDISE DISPLAY SYSTEM
Gerald M. Hagopian, Oak Creek, Wis., assignor to KCS Industries, Inc., Milwaukee, Wis.
Filed Sep. 13, 1994, Ser. No. 305,039
Int. Cl.[6] E05B *73/00*
U.S. Cl. 211—4 **24 Claims**



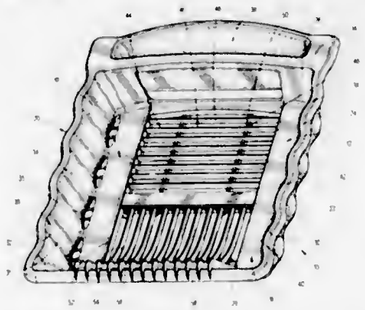
1. A merchandise display system comprising a framework including a support member and a locking member, the support member being adapted to receive at least one locking tab of an attachment member associated with an article of merchandise for supporting the article of merchandise for display on the support member, the support member including a pivot axis and being movable about the pivot axis, the locking member being adapted to contact the locking tab to prevent removal of the merchandise from the support member when the locking member is in a first position with respect to the locking tab, the locking tab being movable with respect to the locking member to avoid contact between the tab and the locking member to permit removal of the merchandise when the locking member is in a second position with respect to the locking tab.

5,588,538
TIRE STACKING METHOD AND APPARATUS
Christopher Rundle, 12598 SW. 60th Ct., Miami, Fla. 33156, and Michael Borell, 7787 SW. 86th St., Apt. 310, Miami, Fla. 33143
Filed Sep. 13, 1995, Ser. No. 527,629
Int. Cl.[6] B65D *85/06*
U.S. Cl. 211—23 **14 Claims**



11. A banding post comprising:
an elongated cylindrical rigid rod having a first end and a second end;
a first member means coupled to said rod and formed from a slidable sleeve having at least two legs hingedly attached to said sleeve with a distal end of said legs foldable outwardly into a perpendicular stance when said sleeve is placed adjacent to said first end of said rod;
a second member means coupled to said rod and formed from a slidable sleeve having at least two legs hingedly attached to said sleeve with a distal end of said legs foldable outwardly into a perpendicular stance when said sleeve is placed adjacent to said second end of said rod;
means for binding said distal ends of said first member means to said second member means for securing a plurality of split tires therebetween.

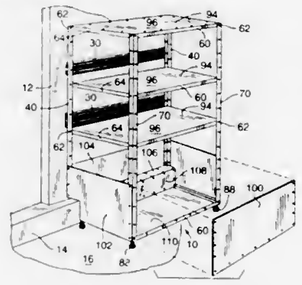
5,588,539
PLASTIC DISH DRAINER HAVING INTEGRAL CUP AREA
Dennis D. Belden, Jr., Akron; Keith E. Brighthill, Wooster; Stephen P. Casteel, Wadsworth; Charles W. Craft, Apple Creek, and Diana W. Juratovac, Columbus, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 14, 1994, Ser. No. 355,548
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—41 **16 Claims**



1. A dish draining rack comprising:
a rack body for containng assorted dishware, the rack body having a central, upward opening dishware receiving chamber

extending from a top rim to a floor surface and defined along opposite sides by a first side panel and a second side panel, the side panels imersecting the floor surface at a bottom end and extending upward therefrom to a top end; and
at least one of the side panels having an inwardly opening, substantially vertical depression imegrally formed to extend therein defined by depression sidewalls sized to receive and support an inverted glass and maintain the glass in an inverted condition within the one side panel, whereby water from the inverted glass is directed to the chamber floor surface.

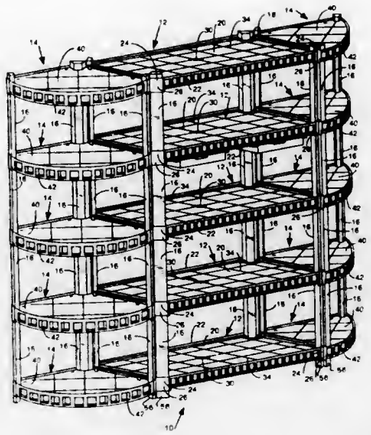
5,588,540
MODULAR STORAGE UNIT KIT
Joel A. Schmit, 1916 NW. 86th Cir., Vancouver, Wash. 98665
Continuation of Ser. No. 243,846, May 16, 1994, Pat. No. 5,495,954. This application Mar. 5, 1996, Ser. No. 610,996
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—90 **5 Claims**



1. An easily assembled storage unit kit securable to a vertical support wall and supported on a non level floor surface, comprising:
a support rail having predetermined mounting positions and adapted for attachment to the vertical support wall in a level orientation;
a framework having mounting positions mated to the predetermined mounting positions of the support rail for mounting the framework to said support rail at said mated mounting positions and independent of said floor surface and achieving thereby level orientation of the framework; and
an adjustable bottom support on said framework, said support adjustable as between the level framework and the non level floor surface and thereby adding to the wall support cooperative support for the framework by said non level floor surface.

5,588,541
HEAVY-DUTY DECORATIVE SHELVING
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Oct. 5, 1994, Ser. No. 318,074
Int. Cl.[6] A47B *47/00*
U.S. Cl. 211—188 **14 Claims**

1. A modular shelf system comprising:
at least one set of horizontal shelf members vertically spaced from each other, each said horizontal shelf member including a plurality of aligned upper and lower leg cavities and a leg supporting lip between said upper leg cavity and said lower leg cavity; and
a plurality of leg members coupled to each said shelf member for spacing said shelf members from each other, wherein each said leg member is received in one said lower leg cavity and includes a supporting shoulder configured to abut against said leg supporting lip to support one of said shelf members which is positioned on top of said shoulder and a leg engaging



portion extending into said upper leg cavity configured for interlocking said leg member with another said leg member positioned above said supported shelf member by being slidably received within said another leg member.

5,588,542
FISHING ROD RACK
Louis J. Winkler, Jr., Rt. 1, Box 110, Hiwassee, Va. 24347, and Louis J. Winkler, Sr., 9 Hopkins St., Glen Burnie, Md. 21061
Filed Apr. 10, 1995, Ser. No. 419,458
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—70.8 **11 Claims**

1. A fishing rod rack comprising:
a lower engaging means which can be mounted to a vertical support surface for receiving and supporting a lower end of a fishing rod;
an upper mounting means securable to a wall surface for receiving and supporting an upper end of the fishing rod,
wherein the upper engaging means comprises an upper mounting plate; a fixed upper support plate mounted to the upper mounting plate and including an upper surface spaced from a lower surface and a longitudinal outer edge, the fixed upper support plate being shaped so as to define a plurality of semi-cylindrical bores directed into the outer edge and extending from the upper surface thereof to the lower surface; a pivoting upper support plate pivotally mounted to an end of the fixed upper support plate, the pivoting upper support plate including an upper surface spaced from a lower surface and a longitudinal inner edge, the pivoting upper support plate

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being shaped so as to define a plurality of semi-cylindrical bores directed into the inner edge and extending from the upper surface thereof to the lower surface, wherein the semi-cylindrical bores of the support plates cooperate to define a plurality of upper receiving apertures through which an upper portion of the fishing rod can project;

wherein the upper engaging means further comprises a latch secured to ends of the support plates;

wherein the upper mounting plate of the upper engaging means includes upper lateral portions extending therefrom, the upper lateral portions being shaped so as to define mounting apertures directed therethrough.

wherein the lower engaging means comprises a lower mounting plate; a lower support plate extending from the lower mounting plate, the lower support plate being shaped so as to define a plurality of spaced lower receiving apertures which receive a lower portion of a fishing rod; and

wherein the lower mounting plate includes opposed upper and lower surfaces, the lower receiving apertures being directed through the lower support plate from the upper surface to the lower surface thereof.

5,588,543

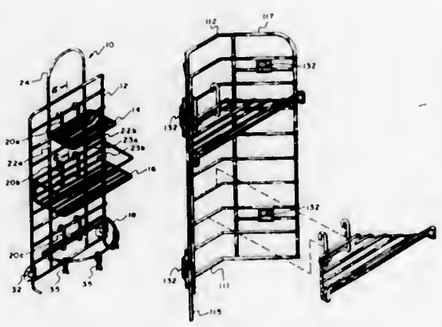
ADJUSTABLE SHELVING SYSTEM

Gary E. Finger, Voorhees, N.J., assignor to Artcraft Wire Works, Inc., Pennsauken, N.J.

Filed Apr. 25, 1994, Ser. No. 232,670

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—90 **13 Claims**



1. An adjustable shelving system comprising:

a frame having a plurality of spaced apart vertical bars and a plurality of spaced apart horizontal bars extending across said vertical bars;

a shelf having a front and a back;

an upper connecting means connected to and extending rearwardly from said back of said shelf, said upper connecting means being engagable with one of said horizontal bars located behind said back of said shelf;

a lower connecting means extending downwardly from said upper connecting means, said lower connecting means extending rearwardly beneath and being engagable with one of said horizontal bars located below the horizontal bar to which said upper connecting means is engaged, and

said lower connecting means being comprised of a pair of members that extend downwardly and rearwardly from said upper connecting means, each of said downwardly and rearwardly extending members including a lower end, said lower connecting means further including a horizontal support member extending between said lower ends of said downwardly and rearwardly extending members, said horizontal support member being situated behind said one of said horizontal bars.

5,588,544

BOTTLE NECK STRUCTURE AND A MANUFACTURING METHOD THEREFOR

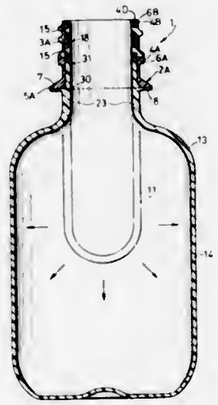
Tadayoshi Takashima, Kobe; Takahiro Chiba, Kawagoe, and Takashi Tanaka, Kobe, all of Japan, assignors to Yamamura Glass Co., Ltd., Hyogo-ken, Japan

Continuation of Ser. No. 560,600, Jul. 13, 1990, abandoned. This application Aug. 3, 1992, Ser. No. 925,584

Claims priority, application Japan, Jul. 31, 1989, 1-199989; Dec. 31, 1989, 1-344814

Int. Cl.[6] B65D *1/02*

U.S. Cl. 215—42 **27 Claims**



1. A bottle neck structure of a synthetic resin bottle comprising:

a resin core member;

said resin core member having a cylindrical body;

said cylindrical body having through-holes therein;

a bottle resin layer covering substantially all of an inside surface of said resin core member;

said bottle resin layer passing through said through-holes and covering a portion of an outside surface of said resin core member; and

said portion of an outside surface having an outside shape adapted for affixing a cap thereto;

said cylindrical body having a circumferential wall;

a flange constituting a support ring of the bottle neck structure comprising at least one exposed surface portion of said outside surface to be in contact with a preform mold when a bottle preform is molded; and

said through-holes being formed in said circumferential wall of said cylindrical body.

5,588,545

CHILD-RESISTANT AND ELDERLY FRIENDLY CLOSURE FOR CONTAINERS

Roger M. King, Latimer, United Kingdom, assignor to Beeson and Sons Limited, Herts, United Kingdom

Continuation of Ser. No. 121,970, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 796,946, Nov. 22, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,201

Claims priority, application United Kingdom, Sep. 23, 1991, 9120264; Oct. 17, 1991, 9122097

Int. Cl.[6] B65D *55/02*

U.S. Cl. 215—216 **11 Claims**

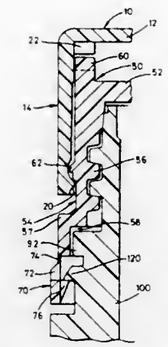
1. A child resistant container closure assembly comprising:

a container neck and a container closure;

said container neck carrying a first screw thread and said container neck further carrying a first locking element;

said container closure comprising:

an inner part and an outer part;



said inner part carrying a second screw thread for screw threaded engagement with said first screw thread of said container neck;

co-operating retaining projections on the inner and outer parts for retaining the inner part within the outer part, and for permitting limited axial movement of the inner part within the outer part;

a first set of castellations on the inner part;

a second set of castellations on the outer part arranged to inter-engage the first set of castellations on the inner part when the outer part is moved axially towards the inner part to permit full torque to be applied to the inner part;

a set of resilient blades extending from a first of the inner and outer parts, said resilient blades bearing against said second of said inner and outer parts to urge said outer part axially in a direction away from said inner part such that said first and second sets of castellations are normally held out of inter-engagement;

each of said resilient blades having a remote end and comprising an abutment surface at said remote end;

said second of said inner and outer parts comprising a set of adjacent ratchet projections, each of said ratchet projections comprising a stop surface and a ramp surface, said stop surface being substantially radial and being constructed and arranged to engage the abutment surface of one of said resilient blades when the outer part is rotated in a first direction to apply the closure to said neck, thereby to permit full torque to be applied to said inner part in said first direction of rotation;

each said ramp surface being constructed and arranged to cam one of the resilient blades over said ratchet projections when the outer closure part is rotated in a second direction opposite to said first direction so that said blades can slip relative to the ratchet projections if said outer part is rotated in said second direction without the first and second sets of castellations being in inter-engagement, said resilient blades transmitting only a limited torque to said ratchet projections owing to frictional engagement of said resilient blades slipping over said ramp surfaces of said ratchet projections;

further comprising a second locking element on said inner part for engaging said first locking element of said container neck when said container closure is screwed into a closed position on said neck to hold said container closure in said closed position;

said first and second locking elements are disengaged from one another at said closed position by (1) moving said outer part axially towards the inner part so that said first and second sets of castellations inter-engage one another and (2) then screwing said closure in said second direction, wherein said first and second locking elements are constructed and arranged to resist loosening of said container closure from the closed position until a predetermined release torque is applied to said inner part in said second direction, which predetermined release torque is greater than said limited frictional torque of said resilient blades and said ratchet projections when said outer part is rotated in said second direction without said first and second sets of castellations being inter-engaged.

5,588,546

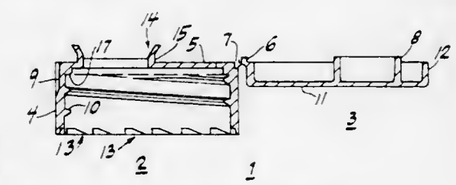
CLOSURE WITH STAY-OPEN LID

Nicholas Farside, Lancaster, Pa., assignor to Kerr Group, Inc., Lancaster, Pa.

Filed May 26, 1994, Ser. No. 249,769

Int. Cl.[6] B65D *43/14*

U.S. Cl. 215—237 **26 Claims**



26. A closure with a stay-open lid, comprising:

(a) a base including:

(i) a base wall having an opening thereon and an outer periphery;

(ii) a first skirt depending from the periphery of the base wall, having an outer edge formed at the juncture of the base wall outer periphery and the skirt;

(iii) an outlet coupled to the base wall and in fluid communication with the opening in the base wall;

(b) a lid connected to said base by a hinge, the closure having a void formed at the juncture of said outer edge and said hinge and at least partially within said hinge, said lid including:

(iv) a lid wall;

(v) a second skirt depending from the periphery of the lid wall;

(vi) a plug depending from the lid wall, the plug being received in the outlet when the lid is in a closed position;

(vii) a nib extending from an edge of the second skirt, the nib being received in the void when the lid is in a closed position on the base, and the nib frictionally engaging the sides of the void when the lid is in the open position, such that the lid is at least partially prevented from closing by the frictional engagement of the nib with the sides of the void.

5,588,547

COVERING DEVELOPED FOR INFUSION BOTTLE

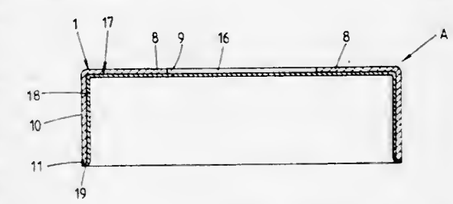
Klaus Derksen, Karlsbad-Ittersbach, Netherlands, assignor to Carl Freudenberg, Weinheim, Germany

Filed Nov. 10, 1994, Ser. No. 337,675

Claims priority, application Germany, Dec. 9, 1993, 43 44 134.3

Int. Cl.[6] B65D *41/58*

U.S. Cl. 215—247 **8 Claims**



1. A covering for closing an infusion bottle, the covering comprising:

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a first cap flanged at its lower edge for gripping a neck of the bottle, the first cap having a hole in its top for the information of a puncture region;

a supplementary cap comprising a pierceable foil and being enclosed by the first cap, the foil including a foil section;

wherein the hole is closed by the foil section of the supplementary cap;

the foil of the supplementary cap extends to the lower edge of the first cap and within the lower edge of the first cap to be flanged with a flange of the first cap;

the foil section of the supplementary cap has a thickness enabling a puncturing of the foil section, the foil being secured to the first cap by an adherence attachment; and

the adherence attachment comprises a formation of edge burrs having an intermeshing of the foil of the supplementary cap with the flange of the first cap.

5,588,548

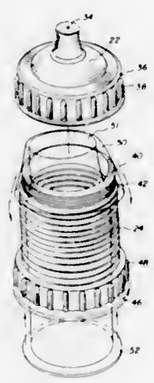
ADJUSTABLE BABY BOTTLENECK

Jacob R. Brankley, 10509 Qualla Rd., Chesterfield, Va. 23832

Filed Jun. 2, 1995, Ser. No. 460,594

Int. Cl.[6] A61J *9/00*, **B65D** *25/48*

U.S. Cl. 215—388 **20 Claims**



1. A baby bottleneck adaptor for use with a conventional baby bottle and a conventional nipple comprising:

(a) a plastic body having a first end with an opening therein and a second end with an opening therein, said opening in said first end communicating with said opening in said second end, said second end having means for mounting a securing ring, said plastic body having means for providing and maintaining a non coaxial alignment of said opening in said first end with said opening in said second end;

(b) external threads at said first end for engaging threads of a securing ring of a conventional baby bottle nipple;

(c) a mounted securing ring mounted at said second end having internal threads for engaging threads of a conventional baby bottle and

(d) a liner having an opening first end and an open second end terminating in means for mating with said mounted securing ring.

5,588,549

CONTAINER WITH SWIVELLING SIDEWALLS

Josef Furtner, Enns, Austria, assignor to Steiner Freizeitmöbel Gesellschaft m.b.H. & Co. KG., Pinsdorf/Aurachkirchen, Austria

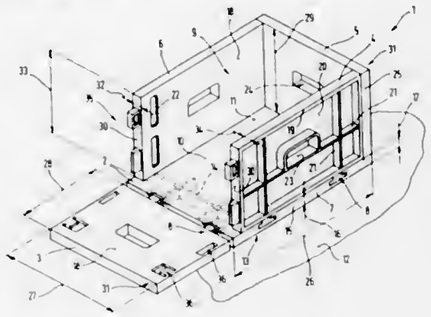
PCT No. PCT/AT93/00166, § 371 Date Jun. 1, 1995, § 102(e) Date Jun. 1, 1995, PCT Pub. No. WO94/11259, PCT Pub. Date May 26, 1994

PCT Filed Oct. 29, 1993, Ser. No. 436,358

Claims priority, application Austria, Nov. 18, 1992, 2284/92

Int. Cl.[6] B65D *6/18*

U.S. Cl. 220—7 **24 Claims**



1. A container comprising

(a) a base having

(1) a surface,

(2) an underside and

(3) longitudinally and transversely extending circumferential side faces between the surface and the underside,

(b) a first pair of side walls facing each other and a second pair of side walls facing each other, each side wall having

(1) a surface facing the surface of the base and

(2) end faces circumferentially delimiting the surface of the side wall,

(c) an articulation device pivotally connecting at least one side wall of each pair to the base whereby the pivotally connected side wall may be outwardly pivoted about a pivoting axis from a first position wherein the side wall extends perpendicularly to the base to a second position wherein the side wall is coplanar with the base,

(1) the surfaces of the base and of the side walls defining an interior chamber of the container in the first position, and

(2) opposite ones of the end faces of the side walls of the second pair defining overlapping regions with the surfaces of the side walls of the first pair,

(d) a connecting device arranged in each overlapping region, the connecting device comprising

(1) a coupling comprised of an extending part defining a slot-shaped recess and an opening arranged to be engaged by the extending part, and

(2) a centering device comprised of an extending part and a receiving portion, the extending part of the centering device being arranged to be received in the receiving portion,

(3) the extending parts of the coupling and centering device projecting from a respective one of the opposite end faces of the side walls of the second pair,

(4) the openings and the receiving portions being arranged in a respective one of the surfaces of the side walls of the first pair in the transition regions, and

(5) an elastically deformable detent arm arranged to project into and engage a contact face of the slot-shaped recess facing the end face of the side walls of the second pair in the first position, each detent arm having an end face facing a bearing face of the opening and enclosing an acute angle with the surface of the side wall of the first pair to extend in a direction facing away from the interior chamber, the elastically deformable detent arm exerting a spring force upon the contact face.

5,588,550

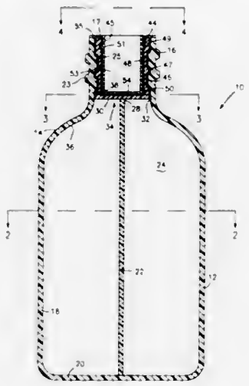
COMPARTMENTED CONTAINER INCLUDING CLOSURE WITH ACCESS TO INDIVIDUAL COMPARTMENTS

Robert C. Meyer, Wilton, Conn., assignor to Pepsico, Inc., Purchase, N.Y.

Filed Oct. 10, 1995, Ser. No. 541,313

Int. Cl.[6] B65D *1/04;51/18*

U.S. Cl. 220—525 **15 Claims**



1. A container, comprising:

a body portion including a bottom wall and a side wall defining a cavity;

a shoulder portion extending from said body portion and further defining said cavity;

a plurality of compartments for holding separate contents, said compartments separated by a partitioning member positioned in said cavity, said compartments and partitioning member extending through said cavity;

a neck portion extending from said shoulder portion having inner and outer wall surfaces, said neck portion defining an opening to said container,said neck inner surface including means for retaining a fitment, wherein said partitioning member terminates below said neck opening and said retaining means; and

a fitment positioned within said neck portion and engaged with said inner wall surface, said fitment being in sealed relationship with said neck portion at said retaining means and freely rotatable relative to said neck portion, said portion including a cover substantially traversing said inner wall and having an opening therein;

wherein said cover is substantially pressure tight and said cover opening is rotatable with said portion into and out of alignment with each of said plurality of compartments for providing access to each of said plurality of compartments for removal of said content therefrom without substantial loss of pressure in each of said plurality of compartments not accessed; and

an access wall extending over said compartments and partitioning member and sealably attached to said partitioning member, said access wall including a number of holes therein leading to said compartments with each hole corresponding to one of said compartments, wherein said opening aligns with said holes via rotation of said portion for acquiring access to said compartments.

5,588,551

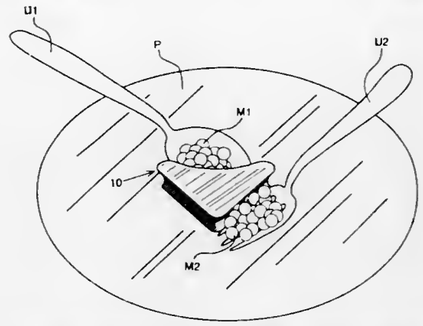
EATING AID

Megan J. Morrow, and Dennis Morrow, both of P.O. Box 123, Wilmington, Vt. 05363

Filed May 15, 1996, Ser. No. 647,654

Int. Cl.[6] A47G *19/02*

U.S. Cl. 220—574.1 **8 Claims**



1. An eating aid comprising: a one-piece, integral, elastically deformable member having a top wall and a continuous side wall with a bottom edge surrounding a depression, wherein the member cooperates with a substantially smooth and planar surface to form a closed chamber when the bottom edge is disposed thereon and adheres to the surface by suction in response to a downward deformation of the top wall and wherein the side wall extends upwardly from the surface when the member is adhered thereto to form an abutment surface with an overhanging lip configured to force food pushed against the abutment surface by an eating utensil onto the utensil when a user is eating food off of the planar surface.

5,588,552

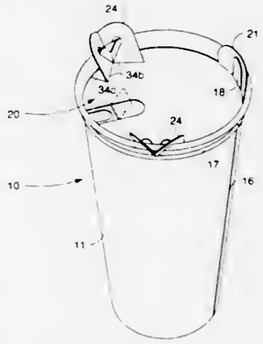
DISPOSABLE ROLLED RIM CUP AND LID CLOSURE

Timothy C. Johnson, 287-3 Dorchester St., Boston, Mass. 02127

Filed Jun. 5, 1995, Ser. No. 463,056

Int. Cl.[6] A47G *19/22*

U.S. Cl. 220—712 **9 Claims**



7. A closure and a container, the container having (i) a circular sidewall with a bottom and an open end with a rim defining a volume for containing a liquid, the closure comprising: a circular substrate having: (a) a diameter to fit within the circular sidewall of the container and to seal the container and (b) a plurality of peripheral talon tabs extending beyond the diameter of the substrate, each talon tab having an opening adapted and located so that, when the closure is placed to seal the container, the talon

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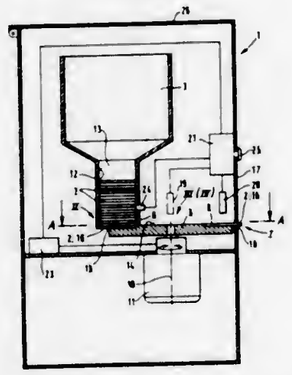
firmly engages the rim of the container by means of the opening to prevent the closure from being pushed into the container.

5,588,553
ISSUING DEVICE FOR DISC-SHAPED PARKING TICKETS
Hans Farmont, Ratingen, Germany, assignor to Farmont Technik GmbH & Co. KG, Germany
Filed Apr. 21, 1995, Ser. No. 426,173
Claims priority, application Germany, Apr. 23, 1994, 44 14 303.6
Int. Cl.[6] G07F *11/00*
U.S. Cl. 221—76 **17 Claims**

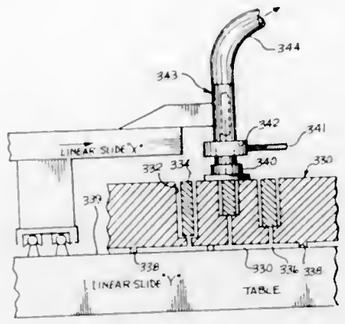


1. An issuing device for disc-shaped parking tickets having a supply container for parking tickets having at least one target station for the removal of parking tickets, having a transporter which runs between the supply container and the target station and is in the form of a drivable turntable which exhibits receptacles which are distributed over the circumference of the turntable and are intended for temporarily receiving in each case at least one parking ticket which is to be issued from the supply container and for guidance during the transporting movement of the turntable, and having at least one measuring device for identification of the parking ticket which is to be issued in each case, wherein the turntable is arranged displaceably, as a stripper for parking tickets beneath an outlet duct which receives a parking ticket stack, is open on the base side and belongs to the supply container the parking-ticket stack, guided laterally by way of the outlet shaft being supported on the turntable by means of the respectively lowermost parking ticket, and the supporting level, in the region of the receptacles of the turntable, being sunken by the height of a parking ticket for the purpose of lateral release of at least the lowermost parking ticket.

5,588,554
FEEDING FASTENERS TO A WORKPIECE
Darrell D. Jones, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 949,177, Aug. 21, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,684
Int. Cl.[6] G07F *11/00*
U.S. Cl. 221—88 **11 Claims**

1. A fastener feed system for selecting a fastener needed for a particular fastening location from a fastener storage area and delivering the fastener to a workpiece where the fastener is to be installed, comprising:

a tray comprising a block of material into which cell holes have been drilled having a floor and a grid partition arrangement



defining a multiplicity of vertically elongated, upwardly opening cells for holding single fasteners in a vertical orientation said grid partition arrangement comprising the material of said block between said cell holes;

a delivery tube for conveying said fasteners, selected and extracted from said tray, to a device for inserting said fasteners into the workpiece;

a suction head attached to said proximal end of said delivery tube for contacting a top edge of said grid partition arrangement and applying suction to a selected cell to suck the fastener in said cell through said suction head and into said delivery tube;

an air hole in the bottom of each of said cell holes and communicating with the bottom surface of said tray; whereby air can flow from below said tray up through said air hole and through said selected cell when said suction head sucks said fastener out of said selected cell;

a motive device for positioning said suction head over said selected cell; and

a control system for controlling said motive device.

5,588,555
SYNTHETIC APPARATUS FOR INSPECTION OF BLOOD
Shigeo Kanamori, Mikishi; Kensaku Aota, Hyogoken; Takashi Demachi, Tarumiku; Takahiro Inoue, Himejishi, and Kiyoyuki Tanaka, Onoshi, all of Japan, assignors to TOA Medical Electronics Co., Ltd., Kobe, Japan
Division of Ser. No. 975,407, Nov. 12, 1992, Pat. No. 5,356,595, which is a division of Ser. No. 865,344, Apr. 8, 1992, Pat. No. 5,270,012, which is a division of Ser. No. 577,689, Sep. 4, 1990, Pat. No. 5,209,903. This application Sep. 8, 1994, Ser. No. 302,543
Claims priority, application Japan, Sep. 6, 1989, 1-230675; Oct. 6, 1989, 1-118146; Jun. 13, 1990, 2-62283; Jun. 13, 1990, 2-62284; Jun. 13, 1990, 2-62285; Jun. 13, 1990, 2-62286; Jun. 13, 1990, 2-62287
Int. Cl.[6] B65H *1/00*
U.S. Cl. 221—197 **8 Claims**

1. A slide supply device comprising:

a base;

means for accepting at least one cassette on said base;

said at least one cassette containing a plurality of slides;

said at least one cassette being removably aligned on said base by said means for accepting;

a slide outlet port in said at least one cassette;

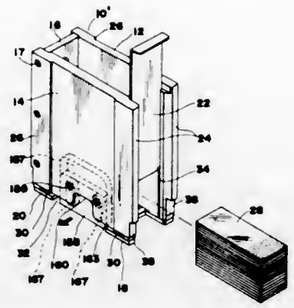
said slide outlet port positioned to allow an individual slide of said plurality of slides to pass through transversely from said cassette;

dispersing means to sequentially disperse said plurality of slides;

closing means being vertically movable on said cassette with a first open position and a second closed position;

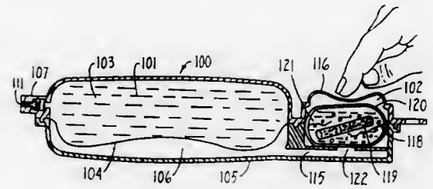
said first open position effective to enable said dispersing means;

said second closed position effective to prevent said plurality of slides from passing through said outlet port; and



cooperating means, between said cassette and said means for accepting, for moving said closing means to a position permitting said slides to pass through said outlet port.

5,588,556
METHOD FOR GENERATING GAS TO DELIVER LIQUID FROM A CONTAINER
Gregory E. Sancoff, Rancho Santa Fe; Mark C. Doyle, San Diego, and Frederic P. Field, Solana Beach, all of Calif., assignors to River Medical, Inc., San Diego, Calif.
Division of Ser. No. 205,875, Mar. 3, 1994, Pat. No. 5,398,850, and a continuation-in-part of Ser. No. 105,327, Aug. 6, 1993, Pat. No. 5,398,851, and Ser. No. 105,284, Aug. 6, 1993, Pat. No. 5,397,303. This application Jun. 5, 1995, Ser. No. 461,871
Int. Cl.[6] B65D *83/14*
U.S. Cl. 222—1 **7 Claims**



1. In an apparatus for the delivery of a liquid from a container, of the type wherein the apparatus includes a first and a second chemical, the first and second chemical being reactive to generate carbon dioxide gas, with the first chemical being disposed in solid form and the second chemical being disposed as a liquid, the improvement comprising:

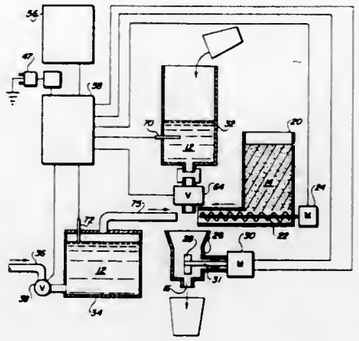
the first chemical being admixed with a rate limiting amount of a rate controlling moiety and formed into a solid mass.

5,588,557
BEVERAGE DISPENSER
William M. Topar, 4664 W. Puget, Glendale, Ariz. 85302
Filed May 19, 1995, Ser. No. 446,565
Int. Cl.[6] B67D *5/08*
U.S. Cl. 222—54 **10 Claims**

1. A beverage dispenser for control of the delivery and mix of a liquid from its source with an ingredient, the dispenser comprising:

means for mixing the liquid and the ingredient, the mixer means being in electrical isolation from the source;

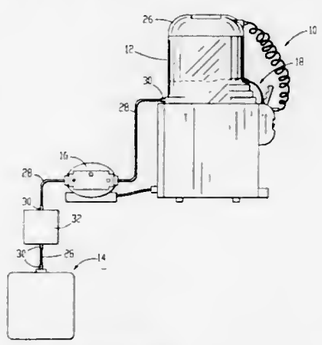
means for delivering the liquid from the source to the mixer means, the liquid providing a conductive path and thereby providing electrical continuity between the source and the mixer means during delivery;



a sensor for detecting the electrical continuity between the source and the mixer means, the sensor being in electrical communication with a control board;

means for delivering the ingredient to the mixer means, the ingredient delivery means being in electrical communication with the control board, the control board activating the ingredient delivery means when the sensor detects the electrical continuity.

5,588,558
LIQUID BEVERAGE DISPENSER
Vance Cox, and Barbara Cox, both of Trenton, Mo., assignors to Van-Bar Enterprises, Inc., Trenton, Mo.
Filed Mar. 17, 1995, Ser. No. 405,847
Int. Cl.[6] B67D *5/08*
U.S. Cl. 222—64 **8 Claims**



1. A liquid dispenser comprising:

a transparent liquid dispensing chamber positioned atop a cabinet for holding and dispensing a liquid therefrom while permitting customers to view the liquid contained therein;

means for dispensing the liquid from said dispensing chamber;

an auger positioned within said dispensing chamber for stirring the liquid contained in said liquid dispensing chamber;

a switch for activating said auger;

a liquid storage chamber for storing additional amounts of the liquid therein;

means for transferring the liquid from said storage chamber to said dispensing chamber; and

a liquid level sensor including measuring means for measuring the liquid level in said dispensing chamber and activating means for activating said transferring means to transfer liquid from said storage chamber to said dispensing chamber when the liquid level drops below a predetermined level, said liquid level sensor including an optical sensor.

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5,588,559

USE OF POLYMERIC MEMBRANES IN THE DISPENSING OF PHARMACEUTICAL SOLUTIONS THAT CONTAIN QUATERNARY AMMONIUM COMPOUNDS AS PRESERVATIVES AND CORRESPONDING DOSE DISPENSER

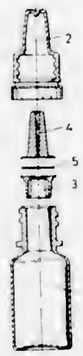
Alberto Vallet Mas, Barcelona, and Francesc X. Gimenez Guasch, Premia de Mar, both of Spain, assignors to Laboratorios Cusi, S.A., El Masnou, Spain

Filed Jun. 24, 1994, Ser. No. 265,409

Claims priority, application Spain, Jun. 25, 1993, 9301443; Jun. 9, 1994, 9401260

Int. Cl.[6] B65D *1/08*

U.S. Cl. 222—92 **12 Claims**



2. A dose dispenser for pharmaceutical solutions, comprising:

a) an easily deformable container;

b) a dropper having a bottom part and a top part said bottom part being received in the container, the top part having a first cylinder unit and the bottom part having a second cylinder unit aligned with the first cylinder unit, said first and second cylinder units containing duct forming projections;

c) at least one polymeric membrane located within the first cylinder unit and the second cylinder unit and between the top part and the bottom part, and

d) a cap constructed to be received on the container over the dropper and including means for securing the cap to the container.

5,588,560

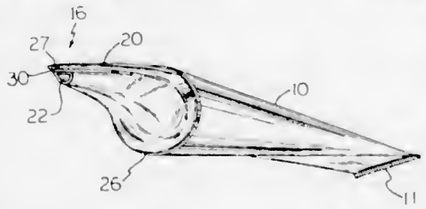
ERGONOMERIC DISPENSER FOR VISCOUS MATERIALS

Dale G. Benedict, Marysville; Frank R. Wilgus, Powell, both of Ohio; Henry J. Fulks, and William T. Gagliardi, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 11, 1996, Ser. No. 584,855

Int. Cl.[6] B65D *35/18*

U.S. Cl. 222—106 **19 Claims**



1. A device for dispensing a viscous material comprising an elongated collapsible tube for containing viscous material, the tube being closed at one end and open at its other end for discharging the contents of the tube; an applicator nozzle formed generally in the shape of an elongated, hollow, tubular-like member, the applicator nozzle having an inlet end with an opening, the inlet end of the applicator nozzle being secured to the open end of the tube, the applicator nozzle having an outlet end with an opening adapted to extrude a bead from contents squeezed out of the tube, the applicator nozzle including an arched throat portion extending upwardly from the inlet end of the applicator nozzle to the outlet end of the applicator nozzle, the arched throat portion being so constructed and arranged so as to provide a gradual transition and change in the cross-sectional shape of the applicator nozzle inlet opening from the inlet end of the applicator nozzle to the outlet end of the applicator nozzle; and a slot formed integrally in the outlet end of the applicator nozzle, the slot providing an applicator blade which extends beyond the outlet end of the applicator nozzle over the opening for extruding the bead; whereby as the tube is squeezed and the bead is extruded on a surface, the applicator blade smoothes the bead as it is being laid along the surface.

5,588,561

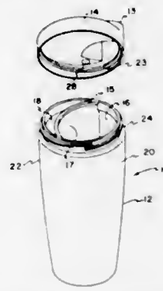
PORTABLE FOOD CONTAINER AND METHOD FOR STORING AND CONSUMING DRY AND LIQUID FOOD

Richard B. Ness, 7710 128th St. West, Apple Valley, Minn. 55124

Filed Mar. 10, 1995, Ser. No. 401,813

Int. Cl.[6] B67D *5/56*

U.S. Cl. 222—129 **5 Claims**



1. A portable food container comprising:

a divided compartment cup having a rigid compartment for holding dry food and a flexible compartment for holding liquid food, wherein said flexible compartment is relatively more

flexible than said rigid compartment; and

a container lid for covering the compartments of said divided compartment cup, said container lid having a first opening for delivering dry food from said rigid compartment and a second opening for delivering liquid food from said flexible compartment.

5,588,562

TAMPER EVIDENT RESEALABLE PLASTIC CLOSURE

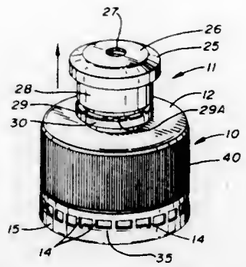
Dieter Sander, Mississauga, and Uwe F. Meyer, Islington, both of Canada

Filed Oct. 31, 1994, Ser. No. 332,140

Int. Cl.[6] B67D *5/33*

U.S. Cl. 222—153.06 **12 Claims**

1. An improvement in a resilient molded plastic resealable closure for a bottle having a neck surrounding an opening, said neck having a spiral thread extending outwardly of said neck; the improvement comprising in combination; a cap having a top portion, an annular depending flange on said top portion, a segmented spiral thread in said annular depending portion, a plurality of



circumferentially spaced outwardly extending frangible elements on said depending flange, a thin flexible annular band on the outer ends of said frangible elements is spaced in relation thereto, said flexible annular band having a plurality of annularly circumferentially spaced elevated bridge portions thereon extending axially towards said depending flange, the elevated bridge portions defining areas of decreased ring spacing from said depending flange therebetween, said frangible elements extending from said elevated bridge portions and from said flexible annular band interconnecting with a bottom edge of said depending flange, a plurality of circumferentially spaced radially inwardly extending arcuate projections on said flexible annular band registerable with an annular locking flange on said bottle's neck on which the closure is positioned, an internal pour spout on said top portion communicating with an opening in said top, said pour spout having an apertured secondary top thereon, and means for positioning a plug in spaced relation to said secondary top portion and said aperture, a top cap movably positioned on said pouring spout and having an opening registerable with said plug defining a closure when said top cap is in a first position, a band having a plurality of frangible elements integrally connected with said band with said top cap in said first position, a plurality of upstanding stops on said band between said frangible elements, a flange on said pour spout retaining said band in said first position when said top cap is moved away from said first position to a second position locating said opening is said top cap in spaced relation to said plug, said flange on said pour spout having a tapered top portion, means for spacing said top cap in relation to said pour spout and means for retaining said top cap on said pour spout in said second position.

5,588,563

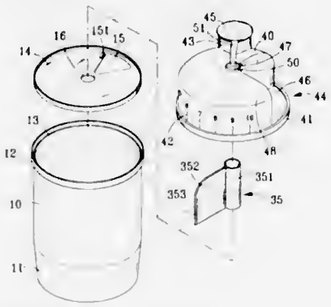
QUANTITATIVE DISPENSER

Chin-Ching Liu, No. 25, Lane 16, Tunghsing St., Shu-Lin Town, Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 328,193, Oct. 21, 1994, abandoned. This application Oct. 6, 1995, Ser. No. 540,265

Int. Cl.[6] G01F *11/46*

U.S. Cl. 222—158 **2 Claims**



1. A quantitative dispenser comprising:

a cylindrical body with a lower part that converges to a bottom, an inner portion of a top end of said body comprises a stepwise annular slot, said slot includes a peripheral flange protruding from said slot, said annular slot angles downward and inward so as to converge toward an inside center of said body;

a separator plate engaged in said inner annular slot at the top of said cylindrical body, having an engaging hole at its center and a flow-through opening near its periphery; its edge angles downward and inward so as to converge toward said inside center of said body;

a volumetric cover with a bottom of said cover engaging said flange at said top end of said body, said cover comprises an outlet projecting vertically from a curved upper outer surface of said cover, a sealing cap on said outlet, a hollow engaging shaft extending from an inner center of said cover toward said central engaging hole, and an annular slot at a lower end of said hollow shaft, wherein said annular slot engages said engaging hole at the center of said separator plate and thereby engages said cover with said separator plate; an outer surface of said cover further comprises a scale and a numerical display;

a cut-out sector converging inwardly at a side of said cover, said cut-out sector comprising sealed sidewalls at each of two sides and a bottom plate in an integral construction with said cover, wherein said bottom plate seals said flow-through opening on said separator plate, and wherein said outlet is provided near one of said sides of said cut-out sector; and said sealing cap is connected with an annular plug via a connecting belt, wherein said annular plug is engages an outer upper end of said engaging shaft;

a scale divider, comprising a sleeve part and a wing part integral to each other, wherein said sleeve part slips on the outside of said hollow engaging shaft of said cover, and an upper peripheral profile of said wing part matches an arcuate undercut beneath an arcuate profile of said cover and a bottom edge of said wing part contacts the surface of said separator plate; wherein, said upper profile of said wing part can be fixed on an inside periphery of said cover, thereby, in combination with said sidewall of said cut-out sector forming a measuring space.

5,588,564

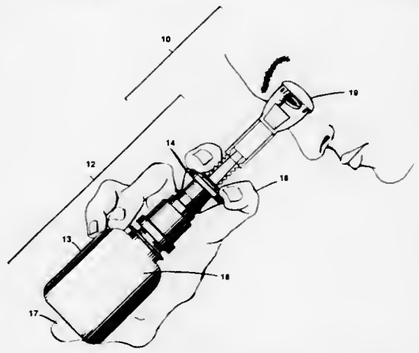
EYE SPRAY MIST DISPENSER

Clifford L. Hutson, 4440 J Shadow Hills Cir., Santa Barbara, Calif. 93105, and Robert Demangus, 1715 N. Pacific Ave., Glendale, Calif. 91202-1108

Filed Aug. 21, 1995, Ser. No. 518,143

Int. Cl.[6] B67D *5/40*

U.S. Cl. 222—383.1 **5 Claims**



1. A device operable for controlling the delivery of a fluid mist discharged from the ejection nozzle of a spray mist dispenser to a person's eye comprising:

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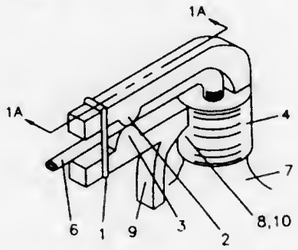
(a) a hollow hemi-ellipsoidal eye cup having a substantially elliptical proximal open end dimensioned to encircle a person's eye and having a skin-contacting rim on said open end contoured to anatomically conform to infra-orbital tissue adjacent to the person's eye and a distal circular open end;

(b) an axially adjustable tube portion comprising a cylindrical outer tube concentrically overlying a cylindrical inner tube, and having an axial mist-conducting lumen coextensive therewith, said outer tube having a proximal end attached to said eye cup to provide fluid communication between said mist-conducting lumen and said distal circular open end of said eye cup and a distal end, said inner tube being slideably disposed within said outer tube and having a proximal end and a distal end, said distal end of said inner tube including attachment means adapted to releasably attach to the nozzle of the spray mist dispenser, said mist-conducting lumen providing a conduit having an adjustable axial length operable for conducting a fluid mist from said distal end of said inner tube to said proximal end of said outer tube.

5,588,565
VALVE FOR DISPENSING PRESSURIZED FLUID THROUGH A FLEXIBLE TUBE
Sidney H. Miller, 850 E. Louther St., Carlisle, Pa. 17013
Filed Feb. 14, 1994, Ser. No. 195,645
Int. Cl.[6] B65D *83/00*
U.S. Cl. 222—394 **7 Claims**

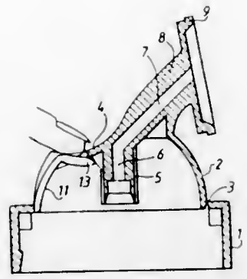


1. A dispensing valve comprising a flexible dispensing tube, the dispensing tube having one end inside of a container and a discharge end outside of the container; a disk attached to the dispensing tube for positioning the tube within the container, said disk being held between a cap and a container top lip; a seal being formed between the disk and the dispensing tube when the dispensing tube expands radially from pressure from a pressurized fluid contained within the container; the dispensing valve further comprising a lever attached to said cap, the lever and the cap having cooperating pinching means for regulating the flow of the pressurized fluid out of the container; and a resilient band encircling the lever and the cap proximal to the dispensing end of the dispensing tube for biasing the lever towards the cap in order to permit discharge of the pressurized fluid only when the lever is actuated.

5,588,566
DEVICE FOR ACTUATING A DISPENSING MECHANISM SUCH AS A VALVE FITTED TO A PRESSURIZED AEROSOL CONTAINER
Vincent de Laforcade, Rambouillet, and Franck Lacout, Athis-Mons, both of France, assignors to L'Oreal, Paris, France
Filed Mar. 4, 1996, Ser. No. 610,291
Claims priority, application France, Mar. 3, 1995, 95 02499
Int. Cl.[6] B65D *83/22*
U.S. Cl. 222—402.11 **8 Claims**

1. An actuating device for a dispensing mechanism fitted to a container, said device comprising:

a fixed annular collar;

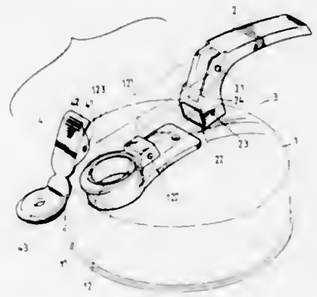


an actuating plate with a circular base defining a periphery pivotally mounted in said annular collar and articulated over a limited area of the periphery of said base to said annular collar, said plate having on a lower face an axial tube for engagement with a valve of the container, said tube having an interior passage extended by a passage projecting upward from said plate up to a terminal dispensing nozzle, said plate having on an upper face a force application area essentially diametrically opposite said articulation area on said annular collar;

a radial cutout in said force application area, said radial cutout including a recess defining a bearing surface; and

a tongue engageable with said recess, said tongue being joined at one end to said annular collar and having a free end, said tongue being positionable in both a first locking position wherein its free end engages said recess and abuts said bearing surface to prevent pivotal movement of said plate, and a second dispensing position in which said tongue is retracted inside said plate out of engagement with said bearing surface to allow pivotal movement of said plate around said articulated limited area of the periphery of said base.

5,588,567
HANDLE ARRANGEMENT FOR TEA KETTLES
Kuo-Strai Yeh, No. 15, Lane 33, Wei Kuo St., Tainan City, 701, Taiwan
Filed Nov. 24, 1995, Ser. No. 562,397
Int. Cl.[6] A47G *19/14*
U.S. Cl. 222—475.1 **2 Claims**



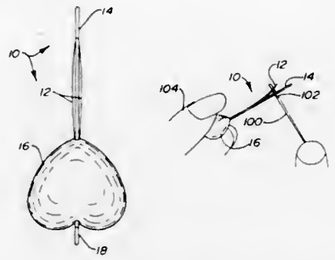
1. A tea kettle comprising:

a tea kettle body having a spout;

a handle base removably mounted to the tea kettle body and having a bore for receiving the spout and an engaging block; and

a handle removably mounted to the handle base and including a hollow member formed at a lower end thereof, the hollow member having an engaging slot defined therein for releasably receiving the engaging block of the handle base.

5,588,568
EYELET THREADER
James M. Flavin, and Myra E. Flavin, both of 2966 Foxcroft Dr., Tallahassee, Fla. 32308
Filed Jul. 20, 1995, Ser. No. 504,425
Int. Cl.[6] D05B *87/02;87/00*
U.S. Cl. 223—99 **5 Claims**

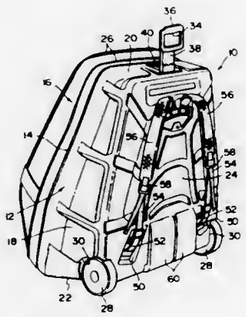


1. An eyelet threader for threading a needle comprising:

a resiliently deformable closed loop member, having a first end for insertion through an eyelet of a needle and receiving a thread therethrough and a second end;

a post member having a first end for insertion in the eyelet of a needle and for guiding the loop member through the eyelet, wherein said po disposed in generally parallel adjacent orientation to the loop member with the second end of the loop member attached to a second end of the post.

5,588,569
CARRIER BAG
Masako Mitomi, Yokohama, and Ryo Hoshino, Tokyo, both of Japan, assignors to Nifco, Inc., and Kabushiki Kaisha Cosmo Area, both of Japan
Continuation of Ser. No. 16,223, Feb. 11, 1993, Pat. No. 5,447,223. This application Apr. 11, 1995, Ser. No. 420,158
Claims priority, application Japan, Feb. 12, 1992, 4-5152
Int. Cl.[6] A45F *4/02*
U.S. Cl. 224—153 **15 Claims**



1. A carrier bag comprising:

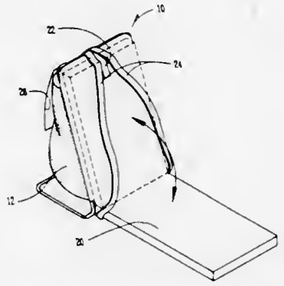
a box member including a bottom plate and first and second pairs of adjoining side plates extending from an outer periphery of said bottom plate, said second pair of side plates including opposing upper and lower plates, and said first pair of side plates extending a height above the bottom plate, wherein the height of the first pair of side plates decreases along a longitudinal direction of the box member from said lower plate to said upper plate such that the box member has a generally tapered side profile, whereby the first and second pairs of side plates provide a peripheral edge which defines an opening that lies in a plane inclined with respect to said bottom plate;

a soft cover attached to the peripheral edge of said side plates, said soft cover covering said opening;

a connecting member provided along said soft cover to allow said soft cover to be partially openable; and

first and second casters each being provided at a respective corner portion of said box member, and when said lower plate is disposed horizontally, said first and second casters support said box member such that said bottom plate is in a substantially vertical state.

5,588,570
COMBINATION BACKPACK AND SEAT DEVICE
Kurt D. Zirbel, 1715 S. Delaware, Mason City, Iowa 50401
Filed Dec. 28, 1994, Ser. No. 365,086
Int. Cl.[6] A45F *4/02*
U.S. Cl. 224—155 **20 Claims**



1. A combination backpacking and seating device, comprising:

a frame having an upper frame member with forward and rearward sides and opposite top and bottom ends, and a lower frame member extending rearwardly from the upper frame member adapted to support the upper frame member in an upright position on a support surface;

a cushion having a top end and a bottom end, the bottom end of the cushion being attached to the bottom end of the upper frame member and the top end of the cushion being movable between a raised position adjacent the forward side of the upper frame member and a lowered position extending forwardly from the bottom end of the upper frame member, the cushion engaging the support surface when moved to the lowered position and the lower frame member is positioned on the support surface;

a storage pouch attached to the upper frame member and residing on the rearward side thereof; and

shoulder straps attached to the upper frame member;

wherein the cushion provides a back pad for a user when in the raised position and wherein the cushion provides a seat pad for the user when moved to the lowered position.

5,588,571
WRIST WALLET AND CARRYING POUCH
Charles Mazzo, 10 Lachlan St., Liverpool, New South Wales, Australia
Continuation-in-part of Ser. No. 305,446, Sep. 13, 1994, abandoned. This application Jan. 2, 1996, Ser. No. 582,089
Claims priority, application Australia, Oct. 29, 1993, 50338/93
Int. Cl.[6] A45C *13/30;* **A45F** *3/14*
U.S. Cl. 224—222 **4 Claims**

1. A waterproof wallet and pouch combination, adapted to be worn around the wrist of a user;

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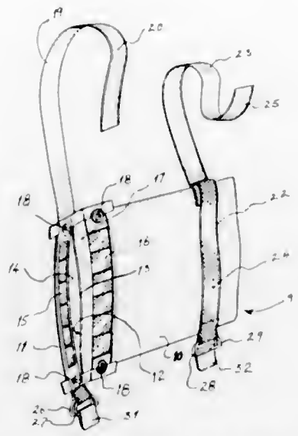


wherein said pouch comprises: a front member; and a back member forming a cavity there between, said back member having an extension portion which extends on one side beyond the respective side of said front member and forming an opening into the cavity, along the respective side of said front member;

a first hook and loop type fastener located on the front of said extension portion of said back member;

a second hook and loop type fastener located on the front of said front member adjacent said opening of the pouch; whereby said hook and loop type fasteners releaseably seal to each other, with said extension portion of said back member folded over and sealing said opening, with a portion of said front member between said opening and said second hook and loop type fastener folding back on itself;

a third hook and loop type fastener located on the back of said extension portion of said back member;

a first strap, having a fourth hook and loop type fastener thereon, extending from one side edge of said extension portion of said back member;

a first ring member located on the other side edge of said extension portion of said back member;

a second strap being connected, adjacent its free ends, to said pouch, adjacent the side edges of said pouch, and extending free across the front of the front member of said pouch substantially parallel to said opening;

a fifth hook and loop type fastener located on said second strap;

a third strap having a sixth hook and loop type fastener thereon extending from one side edge of said pouch adjacent said second strap;

a second ring member located on the other side edge of said pouch adjacent said second strap;

whereby, in use, the back member of the pouch is against the wrist of the user, and the first strap passes through the first ring member with the fourth hook and loop type fastener thereon being releasably secured to the third hook and loop type fastener, and the third strap passes through the second ring member, with the sixth hook and loop type fastener thereon being releaseably secured to the fifth hook and loop type fastener, thereby securing the pouch to the wrist of the user;

wherein said cavity is adapted to removably hold said wallet therein, when the wallet is in its folded configuration,

and wherein said wallet comprises three substantially equal in length flexible sections, extending along the length of the wallet, said sections being a first end section, a middle section, and a second end section; and said wallet further comprises a first compartment extending along all three sections, and at least a second compartment located on the first end section, whereby the wallet is in its folded configuration when said second end section is folded over the middle section.

5,588,572

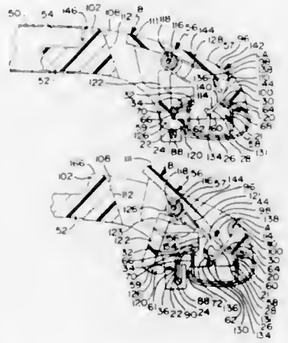
ARTICLE CARRIER

Gary M. Cronce, Port Huron, and Craig A. Stapleton, Troy, both of Mich., assignors to Advanced Accessory Systems LLC, Port Huron, Mich.

Continuation of Ser. No. 187,449, Jan. 26, 1994, abandoned. This application Aug. 31, 1995, Ser. No. 521,843

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—321 **15 Claims**



1. A crossbar for use with an article carrier, said article carrier having a roof rail including at least one detent, said crossbar comprising:

an elongated member;

a latch carried by the elongated member for releasably positioning the crossbar at the at least one detent, said latch having an external actuator and an engager having a contact;

said engager adapted for selectively positioning said contact at a recessed position disengaged from the rail, wherein said crossbar is freely slidable along the roof rail, and selectively positioning said contact in latched position engaging the roof rail at the at least one detent for securing said crossbar at a fixed position along the roof rail and means for resiliently urging said contact to said latched position, and

a retainer for selectively maintaining said contact in said recessed position;

wherein said external actuator is a lever pivotably secured to said support member;

wherein said lever includes a flange and said retainer is an elastically deformable prong extending from said support member adapted to cooperate with said flange, whereby in said latched position said contact is received in said at least one detent, and in said recessed position said flange engages said prong to hold said contact outside said at least one detent, and

said prong is elastically deformed when said flange travels from said latched position to said recessed position.

5,588,573

LOAD-CARRIER FOR VEHICLES

Gerhard Mann, Ulricehamn, Sweden, assignor to Mont Blanc Industri AB, Dalsjofors, Sweden

PCT No. PCT/SE93/00361, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/00315, PCT Pub. Date Jan. 6, 1994

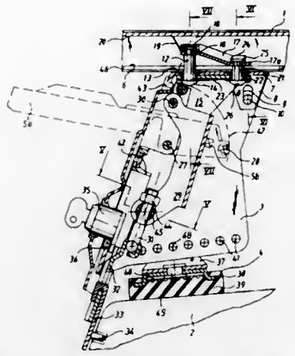
PCT Filed Apr. 26, 1993, Ser. No. 362,473

Claims priority, application Sweden, Jun. 26, 1992, 9201975

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—329 **20 Claims**

1. A load-carrier having a load-carrying tubular rail and adapted to extend across a vehicle roof in a transverse direction of a vehicle, a foot member positionable at each lateral edge of the vehicle roof to support the load-carrying tubular rail, the foot



member adapted to rest on an upper vehicle roof face comprising: a clamping element projecting into an interior of the load-carrying rail from a support on the foot member, the clamping element, which is arranged to be clamped against an inner face of the rail, being connected in a motion-transferring fashion to an actuating member mounted in the foot member, the clamping element comprising a resilient finger having a first and second end, the first end connected to the foot member and the second end of which acts in abutment against the inner face of the load-carrying rail, the resilient finger being directed obliquely outwards in a direction towards said abutting end such that in a tightened position through a lever action said resilient finger tends to displace an upper portion of the foot member inwards, towards a vehicle center.

5,588,574

CYCLE RACK

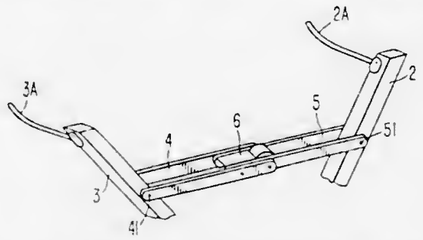
Erik Schmidt, Herning, Denmark, assignor to Erik Schmidt Autotilhelor Aps, Herning, Denmark

Continuation of Ser. No. 926,642, Aug. 10, 1992, Pat. No. 5,388,736, which is a continuation of Ser. No. 743,032, Aug. 9, 1991, abandoned. This application Feb. 14, 1995, Ser. No. 388,405

Claims priority, application Denmark, Apr. 30, 1991, 0792/91

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—520 **20 Claims**



1. A cycle rack for carrying a longitudinally extending object, the cycle rack comprising:

a pair of branches connected to each other at an acute angle at a lower portion thereof so as to be mutually pivotable with respect to each other; and

gripping and holding means for enabling a gripping and holding of the cycle rack on a towing ball hitch;

wherein each of the pair of branches includes at least one carrying arm being mounted on said branch pivotally about a pivot axis extending through said branch in direction of the other branch in the pair of branches, so that the carrying arm is pivotable to occupy a carrying position,

wherein said carrying arm has an inner most portion which is angle shaped and supports a carrying portion of the carrying arm, said carrying portion having an inner end portion which in a carrying position of the carrying arm is positioned at said branch at a lower level than said pivot axis, so that said carrying arm is pivotable from the carrying position up above a top of said branch.

5,588,575

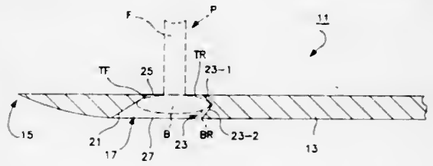
NEEDLE FOR USE IN THE RODLESS DISPENSING OF PLASTIC FASTENERS

Paul A. Davignon, Uxbridge, Mass., assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Sep. 13, 1994, Ser. No. 305,486

Int. Cl.[6] D05B *85/00;97/10;* **B25B** *31/00*

U.S. Cl. 227—67 **15 Claims**



1. A needle for use in dispensing a fastener of the type having a flexible filament and a cross-bar, the cross-bar being disposed at one end of the flexible filament, said needle comprising an elongated member, said elongated member terminating at its front end in a closed-ended tip adapted to penetrate a desired article of commerce, said elongated member also having a chamber adapted to receive a cross-bar of a fastener, said chamber having an opening spaced rearwardly h distance from said closed-ended tip, said chamber being appropriately sized and shaped so that, when the cross-bar is placed within said chamber through said opening and inserted through an article of commerce using said elongated member, the cross-bar is retained within said chamber during insertion of the cross-bar into the article of commerce but is discharged from said chamber through said opening when a predetermined tensile force is applied to said fastener after insertion of the cross-bar and chamber through the article of commerce.

5,588,576

FEEDER FOR COMPONENTS, IN PARTICULAR COMPONENTS DESIGNED WITH A HEAD

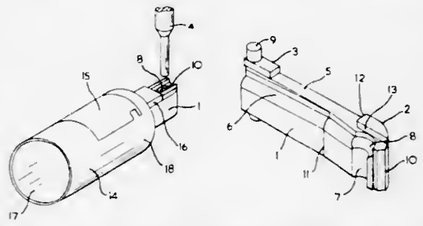
Harold Knetsch, Herborn, Germany, assignor to Emhart Inc., Newark, Del.

Filed Apr. 19, 1995, Ser. No. 424,981

Claims priority, application Germany, Apr. 21, 1994, 9406687 U

Int. Cl.[6] B25B *23/04;* **B23Q** *7/08*

U.S. Cl. 227—119 **9 Claims**



1. A feeder for elongated components comprising a feed tube, said feed tube having an inlet orifice adapted for connection to a feed line and a gripper with at least two gripping arms (**1**) with a channel therebetween, said arms having a front gripping region (**2**) and a rear pivot axis region (**3**), characterized in that

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a) said feed tube has an internal cross section with a lower plane surface and an upper plane surface opposed to said lower plane surface, and said gripper being disposed partially in said feed tube and including an outwardly extending portion;

b) said gripping arms (1) each have a guide step (6) tapering and extending from said pivot axis region to said gripping region (2) said guide step facing toward said upper plane surface, said guide step (6) serving to guide an elongated component; and

c) said gripping arms (1) have, in the gripping region (2), a recess (7) corresponding to the external shape of the elongated components to be gripped.

5,588,577

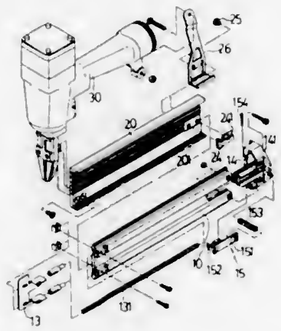
MAGAZINE ASSEMBLY FOR PNEUMATIC STAPLE GUNS

Jacob Chen, Taichung, Taiwan, assignor to Testo Industry Corp., Taipei, Taiwan

Filed Jun. 14, 1995, Ser. No. 490,252

Int. Cl.[6] B25C *3/00;7/00;1/04*

U.S. Cl. 227—120 **3 Claims**



1. A magazine assembly for a pneumatic staple gun, comprising a magazine base, a mounting plate fixedly secured to said magazine base for connecting said base to a gun body of the pneumatic staple gun, a magazine cover covering on said magazine base at one side, and a follow plate connected to said magazine cover by a spring for forcing staples into position for driving, wherein said magazine cover has a rear end connected with an end block and a constraint member, said end block having a head for being grapsed by the hand of an operator to pull said magazine cover backwards from said magazine base, said constraint member having a hook and being turned about a pivot on said end block for hooking up said magazine cover in position; said magazine base has a rear end fixedly mounted with a hooked stop plate at one side, said hooked stop plate having a guide slope for guiding the hook of said constraint member into engagement with said hooked stop plate when said magazine cover is covering on said magazine base.

5,588,578

NAIL FLATTENING APPARATUS

James J. Doyle, 1851 Hidden Oaks Dr., Germantown, Tenn. 37138

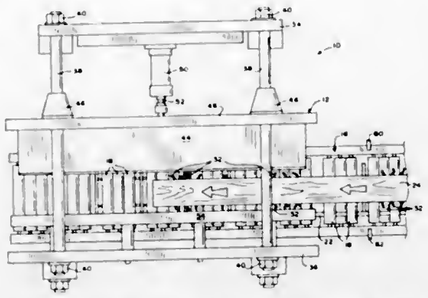
Filed Sep. 2, 1994, Ser. No. 300,710

Int. Cl.[6] B27F *7/04;* **B23P** *19/00*

U.S. Cl. 227—155 **13 Claims**

9. An apparatus for compressing nail stubble on top and bottom surfaces of a pallet stringer, comprising:

(a) a conveyor defining a loading station, whereupon a plurality of said stringers may be individually placed in said apparatus,



and an operating station, whereupon each said stringer is individually compressed, said conveyor having a moving upper surface;

(b) an anvil disposed adjacent said upper surface of said conveyor in the vicinity of said operating station;

(c) a hammer disposed adjacent said upper surface of said conveyor in the vicinity of said operating station facing said anvil, said hammer being reciprocally moveable between extended and retracted positions; and

(d) driving means for forcibly driving said hammer to said extended position, said hammer being relatively close to said anvil when in said extended position;

wherein a stringer, placed longitudinally in said loading station with said top and bottom surfaces projecting laterally, is moved by said conveyor into said operating station, whereupon said hammer is moved to said extended position such that said hammer and said anvil forcibly engage said top and bottom surfaces of said stringer, thereby compressing any nail stubble extending therefrom;

said apparatus further comprising:

(e) at least one lifting member disposed beneath said operating station, selectively moveable between raised and lowered positions, wherein in said raised position said at least one lifting member elevates said stringer above the upper surface of said conveyor while maintaining said stringer in said operating station intermediate said hammer and said anvil.

5,588,579

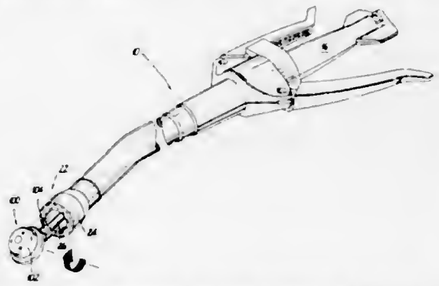
ANVIL FOR CIRCULAR STAPLER

Robert H. Schnut, Carmel, N.Y.; John C. Robertson, Bloomfield, Conn.; Richard J. Gallagher, Milford, Conn., and David N. Fowler, Trumbull, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 296,218, Aug. 25, 1994, abandoned. This application Nov. 15, 1995, Ser. No. 558,341

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—175.1 **24 Claims**



21. An anvil assembly for a circular stapling instrument comprising:

a shaft having proximal and distal end portions;

an anvil pivotally associated with the shaft distal end portion; and

locking means for locking the anvil in a substantially perpendicular orientation relative to the shaft, the locking means at least partially contacting a portion of the shaft.

5,588,580

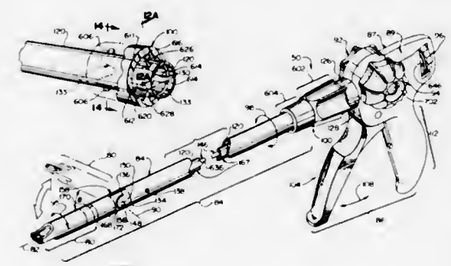
SURGICAL INSTRUMENT

Michel A. Paul, Naperville, Ill., and Jorge Gutierrez, Cincinnati, Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Division of Ser. No. 259,322, Jun. 10, 1994, which is a continuation-in-part of Ser. No. 959,184, Oct. 9, 1992, Pat. No. 5,381,943. This application May 23, 1996, Ser. No. 651,465

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—176.1 **4 Claims**



1. A system for attaching a longitudinally rotatable cartridge of fasteners to a surgical fastener-applying instrument that includes a frame, said system comprising:

a holder on said frame fixed relative to said frame against longitudinal rotation, said holder defining an axially open receiving structure having a first engaging member;

a rotatable carrier having a proximal end retained axially in said holder receiving structure to accommodate longitudinal rotation relative to said holder and to accommodate limited axial movement between proximal and distal axial positions relative to said holder, said carrier having a proximally extending second engaging member for engaging said first engaging member to prevent carrier rotation only when said carrier is in said proximal axial position, said carrier having at least one radially projecting lug; and

a housing integral with said cartridge for being received on said carrier, said housing including at least one radially projecting rib adapted to be disposed proximally of said at least one carrier lug whereby axial movement of said housing onto said carrier with said at least one rib angularly offset from said at least one lug urges said carrier to said proximal axial position for preventing rotation thereof while said housing can be rotated relative to said carrier to position at least a portion of said at least one rib proximally of said at least one lug with at least portions of said at least one rib and at least one lug having an axially aligned relationship to prevent axial withdrawal of said housing from said carrier.

5,588,581

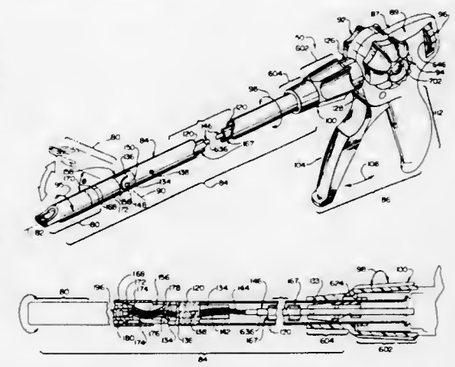
SURGICAL INSTRUMENT

Sean P. Conlon, Cincinnati; Saleem U. Oureshi, West Chester; John A. Hibner, Mainville; Livyn O. Okorocha, Cincinnati, and Gregory D. Bishop, Hamilton, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Division of Ser. No. 259,322, Jun. 10, 1994, which is a continuation-in-part of Ser. No. 959,184, Oct. 9, 1992, Pat. No. 5,381,943. This application May 23, 1996, Ser. No. 652,266

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—176.1 **3 Claims**



1. In a surgical instrument for advancing fasteners from a stored plurality of fasteners wherein said instrument has (1) a frame, (2) an elongated tube mounted to said frame for rotation relative thereto, and (3) a support defining a longitudinal axis and pivotally mounted to said tube for movement to a pivoted position relative to said tube, an actuating system comprising:

a cartridge containing said fasteners and a reciprocatable advancing member in said cartridge for advancing said fasteners, said cartridge mounted to said support for rotation relative thereto about said longitudinal axis;

a dual function operating rod engaged with said advancing member and extending to said frame, said rod including a flexible portion to accommodate pivoting of said support, said rod being longitudinally reciprocatable to move said advancing member and also being rotatable to rotate said cartridge relative to said support; and

an arcuate path-defining structure carried by at least one of said tube and said support for receiving said rod flexible portion to establish a frictional engagement preventing rotation of said cartridge relative to said support when said cartridge is subjected to an externally applied torque that is less than a predetermined minimum torque.

5,588,582

COOLING DRUM FOR A CONTINUOUS CASTING SYSTEM AND METHOD FOR MANUFACTURING THE SAME

Kunimasa Sasaki; Youichi Wakiyama; Takahiro Matsumoto; Kisaburo Tanaka, and Keiichi Yamamoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 257,746, Jun. 9, 1994, Pat. No. 5,469,909. This application May 25, 1995, Ser. No. 450,404

Int. Cl.[6] B23K *20/00*

U.S. Cl. 228—127 **1 Claim**

1. A method for manufacturing a cooling drum for a continuous casting system, comprising of the steps of fitting a hollow cylindrical rigid member in a hollow cylindrical cooling member to establish a set of bonding surfaces, fitting a restraining member around an outer circumferential surface of said cooling member

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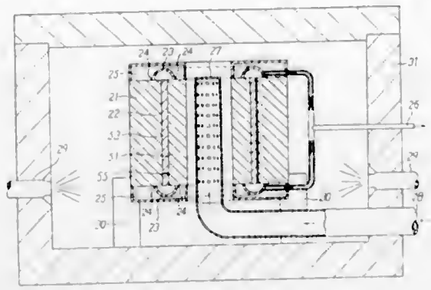


with a releasing agent interposed between said restraining member and said outer surface of said cooling member, raising a temperature of the bonding surfaces of said rigid member and said cooling member and then holding said temperature at 900° C. or higher while maintaining the bonding surface in an evacuated state, further heating said rigid member from its inner circumference side to raise its temperature higher than the temperature of said restraining member wherein the bonding surfaces are metallurgically bonded by pressing them as a result of difference in thermal expansion therebetween, and after effecting bonding of the bonding surfaces, electro-deposition plating a heat-resistance member on said outer surface of said cooling member.

5,588,583

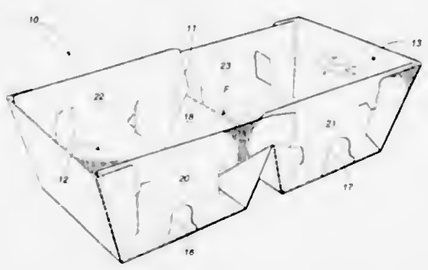
PAPERBOARD CONTAINER HAVING FLEXIBLE PRODUCT DIVIDING KEEL

John W. Cargile, Jr., Decatur, Ga., assignor to Kliklok Corporation, Decatur, Ga.

Filed May 17, 1995, Ser. No. 443,231

Int. Cl.[6] B65D *25/04*

U.S. Cl. 229—120.17 **20 Claims**



1. A container comprising:

a first keel panel;

a second keel panel attached to said first keel panel along a first fold line, said first and second keel panels combining to at least partially form a keel,

a first floor panel attached to said first keel panel along a second fold line;

a second floor panel attached to said second keel panel along a third fold line; and

a first notched side panel attached to said first base panel along a fourth fold line and defining an open-ended notch which fits over and accepts a portion of said keel by contacting at least said second keel panel upon the folding of said container along said first, second, third, and fourth fold lines, said notch having its open end generally directed towards the axis of said fourth fold line.

5,588,584

LIPLESS FOLDING CARTONS AND BLANKS

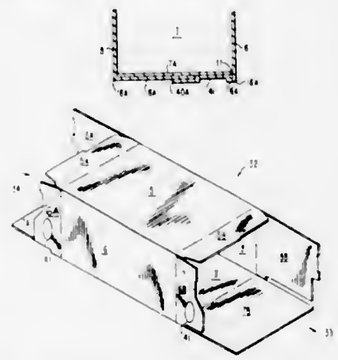
Karl F. DeMay, Newark, N.Y., assignor to Fold-Pak Corporation, Newark, N.Y.

Continuation of Ser. No. 198,993, Feb. 18, 1994, Pat. No. 5,484,102, which is a continuation-in-part of Ser. No. 974,975, Nov. 12, 1992, Pat. No. 5,288,012, which is a continuation-in-part of Ser. No. 796,758, Nov. 25, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 458,896

The portion of the term of this patent subsequent to Nov. 12, 2012, has been disclaimed.

Int. Cl.[6] B65D *5/28;5/66*

U.S. Cl. 229—132 **1 Claim**



1. A carton assembled from a foldable blank, said carton comprising:

(a) cover, top, rear, bottom and front panels hingedly connected in the order named, said cover, top, rear, bottom and front panels each having left and right ends and said front panel further having a first edge free of a first lip portion and said top panel being hingedly connected to said cover panel by way of a first fold line;

(b) left and right bottom panel end flaps hingedly connected to said left and right ends of said bottom panel, said left bottom panel end flap having a second edge free of a second lip portion and said right bottom panel end flap having a third edge free of a third lip portion;

(c) left and right front panel end flaps hingedly connected to said left and right ends of said front panel, said left front panel end flap having a fourth edge free of a fourth lip portion and said right front panel end flap having a fifth edge free of a fifth lip portion;

(d) left and right top panel end flaps hingedly connected to said left and right ends of said top panel by way of second and third fold lines, respectively;

(e) left and right rear panel end flaps hingedly connected to said left and right ends of said rear panel;

(f) left and right cover panel end flaps hingedly connected to said left and right ends of said cover panel;

(g) said cover panel is adhesively connected to said front panel;

(h) said left bottom panel end flap is folded first, said left front panel end flap is folded second to overlie a portion of said left bottom panel end flap, said left top panel end flap is folded third, said left rear panel end flap is folded fourth and at least two of said left panel end flaps are adhesively connected together;

(i) said right bottom panel end flap is folded first, said right front panel end flap is folded second to overlie a portion of said right bottom panel end flap, said right top panel end flap is folded third, said right rear panel end flap is folded fourth and at least two of said right panel end flaps are adhesively connected together;

and wherein at least one of said edges free of a lip portion engages at least one of said fold lines.

5,588,585

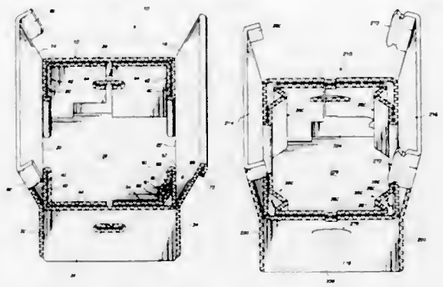
AUTOMATIC SET-UP CARTON WITH CORNER POSTS

Jack A. McClure, Garden City, Kans., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Mar. 15, 1996, Ser. No. 616,593

Int. Cl.[6] B65D *21/032;21/036*

U.S. Cl. 229—191 **15 Claims**



1. A carton formed from a one-piece blank, comprising:

a floor;

a pair of opposed first side walls hingedly joined to the floor along respective fold lines;

a pair of opposed second side walls hingedly joined to the floor along respective fold lines, said first side walls and said second side walls each having opposed side edges located at outside corners of the carton;

and at least one corner post extending from a side edge of one of said second side walls adjacent a side edge of one of said first side walls and, said corner post comprising a serial succession of post panels joined end-to-end by fold lines, the post panels folded with a double-reentrant fold to generally form a Z-shape cross-section.

5,588,586

INTERLOCKING ARRANGEMENT

Emanuel Negelen, Schweich, Germany, assignor to Riverwood International Ltd., Bristol, United Kingdom

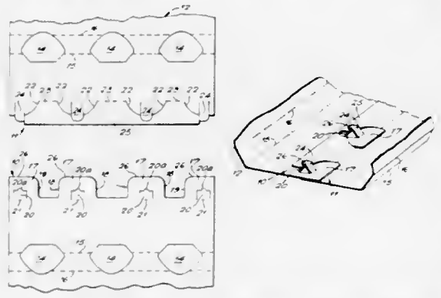
PCT No. PCT/GB93/02060, § 371 Date May 10, 1995, § 102(e) Date May 10, 1995, PCT Pub. No. WO94/07759, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 4, 1993, Ser. No. 411,659

Claims priority, application United Kingdom, Oct. 7, 1992, 9221130

Int. Cl.[6] C65D *77/22*

U.S. Cl. 229—198.2 **15 Claims**



1. An interlocking device for coupling two pieces of sheet material, comprising:

guide means for enabling the two pieces to be moved towards and away from each other, the guide means including a projecting portion on a first piece of said two pieces and means for defining an associated opening in a second piece of said two pieces, said opening for receiving said one projecting portion; and

means for locking said two pieces together comprising at least one hinged tongue having a free end and formed in one of said first piece or said second piece and, in use, extending towards the other of said first piece or said second piece, said locking means further comprising at least one flap formed in said other piece and being hingedly connected to said other piece thereby defining a hole in said other piece;

said projecting portion, said opening, said tongue, and said flap are positioned relative to each other such that said projecting portion is inserted into said opening and the tongue is pushed into engagement with the flap, said flap pivoting to allow the tongue to pass through the hole;

wherein said flap has a resilience such that the flap firmly engages a bottom surface of the tongue as the tongue is being pushed into the hole, said tongue and said flap causing said first and second pieces to become interlocked to each other; and

wherein the opening is enclosed within the second piece and is generally arcuate with an edge portion of the second pieced being narrowest approximately at a center of the opening.

5,588,587

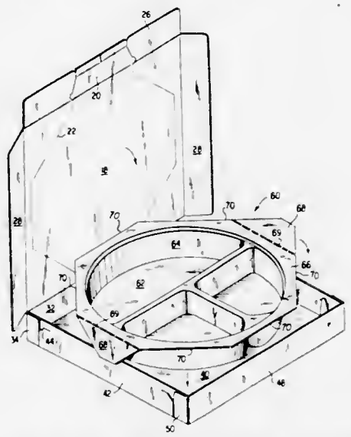
DUAL OVENABLE FOOD PACKAGE

David E. Stier, Middletown, and Katherine S. Liquori, Goshen, both of N.Y., assignors to International Paper, Purchase, N.Y.

Filed Nov. 22, 1995, Ser. No. 561,729

Int. Cl.[6] B65D *5/20;6/06*

U.S. Cl. 229—232 **7 Claims**



1. A container formed from a unitary blank of paperboard and being of generally rectangular parallelepiped form for packaging a food containing dish, the container having a bottom wall, four side walls, and a top wall, one of said container side walls being a first of said container side walls defined by a depending wall from said top wall and an upstanding wall from said bottom wall to thereby define a first container side wall of two plies of paperboard, a dish positioned on said container bottom wall, said dish having a bottom and upstanding side walls, said dish bottom resting on said container bottom wall, said dish having an upper horizontal flange extending radially outwardly therefrom, said horizontal flange having a first radially outwardly extending ear, said a first flange ear being bent downwardly and sandwiched between said two plies of paperboard of said first container side wall, means carried by said container top wall for facilitating ripping off a portion thereof to yield an access opening to said dish, said access opening being

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smaller in dimension than said dish flange to thereby prevent said dish from being removed from said container after said ripping.

5,588,588

SIGNAL DEVICE FOR USE WITH A MAILBOX

Harold N. Byrd, Purdon, Tex., assignor to B&B Partnership, Corsicana, Tex.

Filed Feb. 2, 1995, Ser. No. 382,571

Int. Cl.[6] B65D *91/00*

U.S. Cl. 232—35 **13 Claims**

1. A signal device for a mailbox having a front end, a rear end, a downward facing side, and a door, said door mounted to the front end of said mailbox, said signal device comprising:

(a) an angle plate adapted for attachment to the downward facing side of said mailbox, said angle plate having a top portion and a side portion;

said top portion oriented generally horizontal;

said side portion depending from said top portion in a generally vertical direction and having first and second ends;

said first end having a pivot pin formed thereon;

said second end having upper and lower arms extending rearward from said second end forming a rearward opening notch therebetween, said upper arm having a length greater than said lower arm so as to form a shoulder on the upper side of said notch; and

(b) a lever member having a shank member and an indicating member;

said shank member having first and second ends and a central portion therebetween;

said central portion having an elongated slot formed therein, said slot slidably and pivotally engaging said pivot pin on said angle plate;

said first end having a friction surface formed thereon;

said indicating member mounted on said second end of said shank member;

said indicating member dimensioned to engage said notch in said angle plate when said lever member has been pivoted until said shank member encounters said shoulder and said lever member has further been translated into a forward position; and

said indicating member further dimensioned to disengage said notch in said angle plate when said lever member is translated rearward.

5,588,589

AIR CONDITIONER

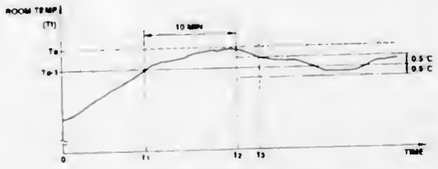
Manabu Ishihara; Tsuyoshi Rakuma, both of Gunma-ken; Hiroshi Kanai, Saitama-ken; Takashi Fudo, and Masato Watanabe, both of Gunma-ken, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 22, 1995, Ser. No. 447,068

Claims priority, application Japan, Aug. 19, 1994, 6-195781

Int. Cl.[6] G05D *23/00*

U.S. Cl. 236—46 R **9 Claims**



1. A device for regulating the temperature in a room comprising:

room temperature detection means for detecting the temperature in the room;

temperature setting means for setting a target temperature;

air conditioning means for performing an air conditioning operation to bring the room temperature detected by said room temperature detection means toward said target temperature; and

target temperature changing means for correcting said target temperature to rise and fall periodically in accordance with a predetermined rule after the room temperature has substantially reached said target temperature by operation of said air conditioning means and shifting the average value of said target temperature after the correction has been made in such a direction that the air conditioning load on said air conditioning means is reduced from that for attaining said target temperature before the correction.

5,588,590

EXPANSION VALVE COMBINED WITH A SOLENOID VALVE

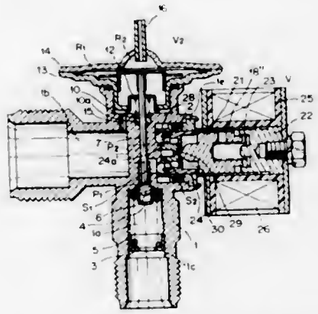
Hisayoshi Sakakibara, Nishio; Tomoo Okada, and Tadaaki Ikeda, both of Sayama, all of Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, and Nippondenso Co., Ltd., Aichi, both of Japan

Filed Nov. 29, 1994, Ser. No. 350,061

Claims priority, application Japan, Nov. 30, 1993, 5-299887

Int. Cl.[6] F25B *41/04*

U.S. Cl. 236—92 B **11 Claims**



1. An expansion valve combined with a solenoid valve for use in a refrigerant cycle, comprising:

a valve body with a primary port and a secondary port formed therein;

a refrigerant passage formed in said valve body between said primary port and said secondary port;

a solenoid valve attached to said valve body to open and close said refrigerant passage at an intermediate portion thereof;

a diaphragm defining an outer pressure chamber and an inner pressure chamber, said outer pressure chamber being communicated to a temperature sensing means;

an expansion valve member moved by action of said diaphragm to come into and out of contact with a valve seat formed at said primary port side of said refrigerant passage on an upstream side of said solenoid valve for performing a cooling operation; and

an inner pressure equalizing hole formed in said valve body to communicate said secondary port side on a downstream side of said solenoid valve with said inner pressure chamber.

5,588,591

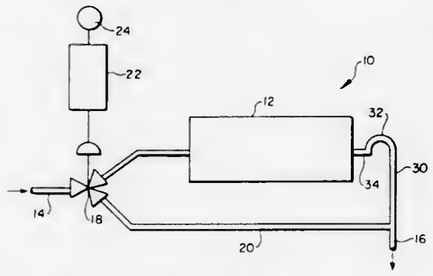
HEAT DISSIPATION UNIT

Bruce K. Sweitzer, Jr., 2145 N. Glade Rd., Swanton, Md. 21561

Filed Aug. 31, 1995, Ser. No. 522,494

Int. Cl.[6] F24D *3/10*

U.S. Cl. 237—8 C **6 Claims**



4. A heating system for heating a plurality of rooms within a building, said heating system comprising:

a source of heating fluid supplying heating fluid;

a piping system for conducting said heating fluid to each of the plurality of rooms, said source of heating fluid being in communication with said piping system;

a pump for circulating said heating fluid through said piping system; and

at least one heat dissipation sub-system provided in each of the plurality of rooms, said heat dissipation sub-system receiving heating fluid from said piping system, said heat dissipation sub-system including,

a heat dissipation unit having an inlet opening and a discharge opening, said heat dissipation unit being dimensioned and configured to allow heat transfer from said heating fluid flowing therethrough to air contained in a respective one of the plurality of rooms, said discharge opening being in fluid communication with a discharge conduit,

an anti-backup fitting provided intermediate said discharge opening and said discharge conduit, said anti-backup fitting having a bend portion, said bend portion being located at an elevation above said discharge opening,

a three-way valve having a movable member, said movable member being movable between a first and a second position, said three-way valve having a valve inlet, a first outlet, and a second outlet, said movable member allowing fluid communication between said valve inlet and said first outlet when in said first position, said movable member allowing fluid communication between said valve inlet and said second outlet when in said second position, and said first outlet being in fluid communication with said inlet opening, and

a bypass pipe having a bypass pipe inlet and a bypass pipe outlet, said bypass pipe inlet being in fluid communication with said second outlet, and said bypass pipe outlet being in fluid communication with said discharge conduit, whereby said three-way valve selectively directs heating fluid through said heat dissipation unit and said bypass pipe;

said piping system includes a heating fluid supply pipe communicating with said valve inlet of said at least one heat dissipation sub-system in each of the plurality of rooms, and a heating fluid return pipe communicating with said discharge conduit of said at least one heat dissipation sub-system in each of the plurality of rooms.

5,588,592

METHOD AND APPARATUS FOR DETECTING THE ONSET OF FLOODING OF AN ULTRASONIC ATOMIZER

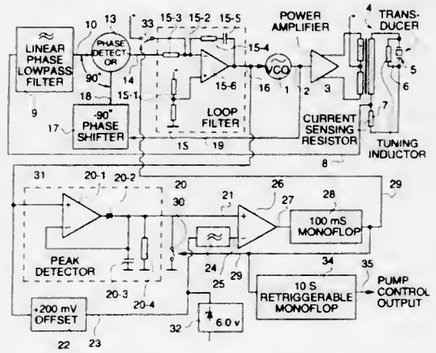
Robert F. Wilson, Vancouver, Canada, assignor to J. Eberspächer, Esslingen, Germany

Filed Apr. 13, 1995, Ser. No. 421,685

Claims priority, application Germany, Apr. 14, 1994, 44 12 900.9

Int. Cl.[6] H03B *5/30;* **B05B** *1/08*

U.S. Cl. 239—4 **20 Claims**



6. An atomizer comprising:

a transducer means for converting driving signals into vibrations;

excitation means for sending said driving signals to said transducer means, said excitation means generating said driving signals to correspond to a natural resonance frequency of said transducer means, said excitation means changing said driving signals to follow changes in said natural resonance frequency of said transducer means;

frequency detection means for monitoring said driving signals and for determining a rate of change of said frequency of said natural resonance frequency, said frequency detection means also generating a flooding signal when said rate of change of said frequency of said natural resonance frequency exceeds a threshold value.

5,588,593

SAFETY APPARATUS FOR HIGH PRESSURE LIQUID JET SYSTEM

Thomas B. Boisture, Baytown, Tex., assignor to C.H. Heist Corp, Baytown, Tex.

Filed Jun. 5, 1995, Ser. No. 464,958

Int. Cl.[6] B05B *1/02;15/00;* **B26F** *3/00*

U.S. Cl. 239—67 **17 Claims**

1. A safety apparatus for use in a high pressure fluid jet system for operation by an operator, said fluid jet system includes a high pressure fluid source for supplying fluid, a nozzle for ejecting said fluid, and an electrically operated valve having an on-off flowthrough path, said flowthrough path coupled between said high pressure fluid source and said nozzle, said safety apparatus comprising:

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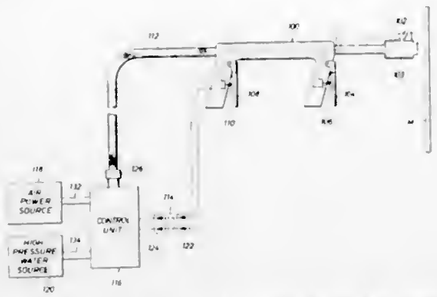


a trigger switch operable by the operator of the high pressure fluid jet system and

a proximity switch located near the nozzle for indicating when said proximity switch is within a first distance of a structure to be operated on by the high pressure fluid jet system,

said trigger switch and said proximity switch connected to the valve to operate the valve when said trigger switch is operated by the operator and said proximity switch indicates proximity to the structure at a concurrent time.

5,588,594

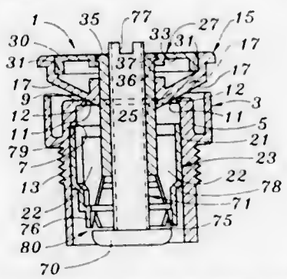
ADJUSTABLE ARC SPRAY NOZZLE

Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408

Filed Feb. 3, 1995, Ser. No. 383,073

Int. Cl.[6] B05B *1/32;15/02*

U.S. Cl. 239—107 **20 Claims**



1. An adjustable orifice sprinkler spray nozzle assembly, comprising fixed housing means defining a passage having an inlet for attachment to a source of pressurized water and an outlet defined by a spiraled edge having radially offset ends for dispensing water, said outlet having an axis, said radially offset ends being connected; and moveable means including means defining a sloped axially spiraled surface cooperating with said spiraled edge of said fixed housing means for defining an adjustable arcuate dispensing orifice adjustable about the axis of said outlet.

5,588,595

NUTATING SPRINKLER

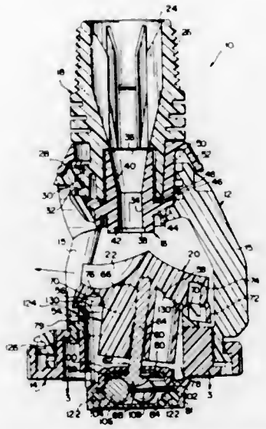
Frederick J. Sweet, College Place, and Larry P. Meyer, Walla Walla, both of Wash., assignors to Nelson Irrigation Corporation, Walla Walla, Wash.

Continuation-in-part of Ser. No. 212,938, Mar. 15, 1994, Pat. No. 5,439,174. This application May 19, 1995, Ser. No. 446,099

Int. Cl.[6] B05B *3/02*

U.S. Cl. 239—222.17 **15 Claims**

1. A sprinkler comprising a body portion having a nozzle at one end and a cap assembly supported thereon at an opposite end, said



cap assembly supporting a spray plate located downstream of said nozzle, said spray plate having a plurality of stream distributing grooves formed on one side thereof configured to cause said spray plate to rotate when struck by a stream emitted from said nozzle; and wherein said spray plate includes a mounting shaft extending from said spray plate and having a part spherical head received within a bearing cage in said cap assembly, said bearing cage including a bearing separator holding a plurality of ball bearings in a substantially horizontal array arranged about a longitudinal center axis of said sprinkler, said part spherical head located centrally above and in engagement with said plurality of ball bearings, thereby permitting said spray plate to wobble as it rotates

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5,588,596

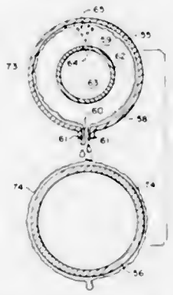
FALLING FILM EVAPORATOR WITH REFRIGERANT DISTRIBUTION SYSTEM

Jon P. Hartfield, and Duane F. Sanborn, both of La Crosse, Wis., assignors to American Standard Inc., Piscataway, N.J.

Filed May 25, 1995, Ser. No. 449,965

Int. Cl.[6] A23C *3/04;* **B05B** *15/00*

U.S. Cl. 239—542 **18 Claims**



1. A spray tree distribution system comprising:

a fluid inlet;

a manifold operably connected to the fluid inlet and adapted to receive fluid therefrom;

a plurality of substantially horizontal fluid distributing devices operably connected to the manifold and adapted to receive fluid therefrom;

wherein each of the fluid distributing devices includes an outer tube defining an interior chamber having at least one fluid outlet from the interior chamber and an inner connected to the manifold and having at least one fluid outlet open to the interior chamber.

5,588,597

NOZZLE PLATE FOR A LIQUID JET PRINT HEAD

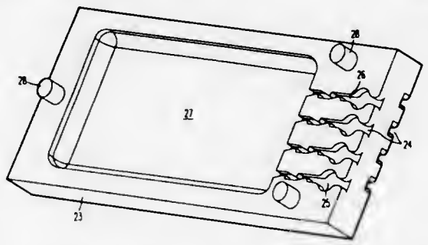
Holger Reinecke; Nezih Unal, both of Dortmund; Ralf-Peter Peters, Bergisch-Gladbach; Frank Bartels, Hattingen, and Friedolin F. Noker, Karlsruhe, all of Germany, assignors to MicroParts GmbH, Dortmund, Germany

Filed Aug. 30, 1994, Ser. No. 297,780

Claims priority, application Germany, Sep. 3, 1993, 43 29 728.5

Int. Cl.[6] B05B *1/14;* **B41J** *2/14*

U.S. Cl. 239—553.5 **1 Claim**



1. A nozzle comprising:

a cast plate structure; and

functional regions in said plate structure, said functional regions including at least one nozzle, at least one liquid chamber, at least one supply container and connection channels connecting said at least one nozzle, said at least one liquid chamber and said at least one supply container, wherein said plate structure has at least one nozzle on opposite sides thereof, including further plates assembled to said opposite sides and having heating elements and electrical connections for said nozzles.

5,588,598

COMMINGLED RECYCLABLES RECOVERY AND RECYCLING PROCESS AND RELATED APPARATUSES

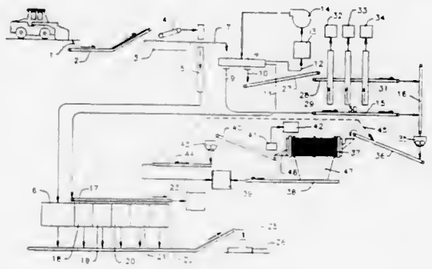
John C. Becker, 12 Ella St., Valley Stream, N.Y. 11580; John D. Cameron, Jr., 59 Royal Ct., Rockville Center, N.Y. 11570; William L. Cameron, 241 W. Pine St., Long Beach, N.Y. 11561, and Bryan W. Sinram, 7 Bucknell La., Stony Brook, N.Y. 11561

Continuation of Ser. No. 863,044, Apr. 3, 1992, Pat. No. 5,333,797. This application Jul. 28, 1994, Ser. No. 281,927

The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[6] B02C *23/40*

U.S. Cl. 241—19 **7 Claims**



1. A recycling process, comprising:

receiving a stream of commingled materials;

mechanically splitting said stream of commingled materials into a plurality of substreams, comprising:

separating ferrous materials from said materials stream by vibrating said stream of commingled materials in a non-magnetizable vibrating receptor;

moving a magnetic belt over said vibrating stream of commingled materials and magnetically lifting ferrous material from said stream of commingled materials;

splitting off from said stream of commingled materials a substream of mixed particulate and passing said substream onto a variable speed conveyor, varying the speed of the conveyor to accommodate variation in the amount of materials in said substream and hand sorting unlike particulate one from the other from said substream;

splitting off from said stream of commingled materials a substream of particles of varying density comprising first particles having at least a predetermined density and second particles of less density than said first particles;

carrying said second particles away from said first particles in a stream of air to split said substream of particles of varying density into a sub-substream of said first particles and a sub-substream of said second particles.

5,588,599

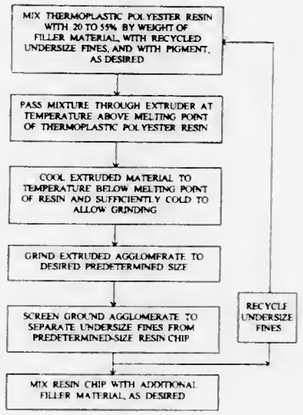
METHOD OF MANUFACTURE OF POLYESTER-CHIP PRODUCTS FOR CASTING ARTIFICIAL-STONE ARTICLES

James P. Novak, 4625 S. 3rd Ave., Tucson, Ariz. 85714

Filed Sep. 12, 1994, Ser. No. 304,148

Int. Cl.[6] B02C *19/00;19/12*

U.S. Cl. 241—23 **12 Claims**



1. A method for preparing resin chips for use as an intermediate product in the manufacture of artificial-granite and artificial-stone articles, comprising the following steps:

(a) mixing a thermoplastic polyester resin with a filler material in predetermined proportions and feeding the resulting mixture through a heated extruder at a temperature sufficiently high to melt the thermoplastic polyester resin;

(b) cooling the output from the extruder to a temperature below a melting point of the thermoplastic polyester resin to produce a solid material;

(c) grinding said solid material to produce resin chips of a predetermined particle size;

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(d) screening said resin chips of a predetermined particle size to separate them from undersize fines of resin material; and

(e) recycling at least a portion of said undersize fines as feedstock to the extruder in step (a).

5,588,600

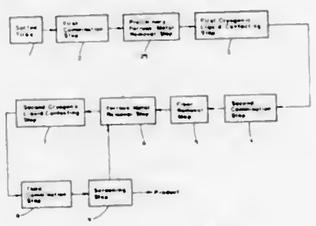
PROCESS AND APPARATUS FOR MAKING CRUMB RUBBER FROM VEHICLE TIRES

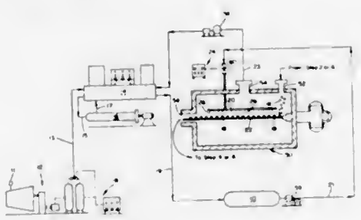
Kenneth F. Perfido, 12 Autumn Dr., Mount Sinai, N.Y. 11766, and Anthony M. Cialone, 34 Carnation Ave., Floral Park, N.Y. 11001

Filed Jun. 7, 1995, Ser. No. 484,233

Int. Cl.[6] B02C *19/12;23/08*

U.S. Cl. 241—23 **39 Claims**





1. A process for recovering crumb rubber from vehicle tires comprising:

(a) shredding vehicle tires to provide rubber particles which include embedded fiber and/or ferrous metal;

(b) contacting said rubber particles produced in step (a) with a cryogenic liquid wherein said rubber particles are chilled and cryogenic liquid vaporized;

(c) collecting and conveying said cryogenic fluid utilized in step (b) to a cryogenic reliquefaction means;

(d) reducing the particle size of said particles treated with said cryogenic liquid in step (b);

(e) removing substantially all of said fiber and said ferrous metal from said product of step (d) whereby fiber- and ferrous metal-free rubber particles are produced;

(f) contacting said rubber particles produced in step (e) with a cryogenic liquid wherein said rubber particles are cooled and cryogenic liquid is vaporized;

(g) collecting and conveying said cryogenic fluid product of step (f) to said cryogenic reliquefaction means;

(h) reducing the size of said cryogenic liquid-contacted rubber particles produced in step (f);

(i) recycling Cryogenic liquid reliquefied in said cryogenic reliquefaction means to steps (b) and (f) for reuse therein; and

(j) screening said rubber particles produced in step (h) and recovering a crumb rubber product.

5,588,601

YARN WINDING METHOD AND APPARATUS FOR CARRYING OUT SAME

Ralf Korber, Remscheid, Germany, assignor to Barmag AG, Remscheid, Germany

PCT No. PCT/EP93/03104, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO94/12421, PCT Pub. Date Jun. 9, 1994

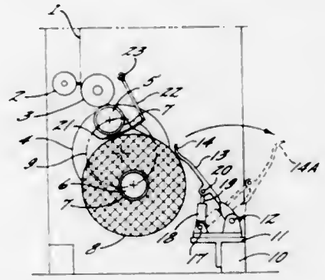
PCT Filed Nov. 5, 1993, Ser. No. 256,843

Claims priority, application Germany, Nov. 26, 1992, 42 39 752.9

Int. Cl.[6] B65H *67/044;54/00*

U.S. Cl. 242—18 EW **29 Claims**

9. A method of winding a continuously advancing yarn onto a



rotating bobbin to form a yarn package, and comprising the steps of

winding the advancing yarn onto a rotating bobbin positioned on a winding spindle at a winding position and including traversing the yarn at a location upstream of the winding position to thereby form a cross wound package on the bobbin,

laterally moving the winding spindle and the rotating bobbin from said winding position to a doffing position upon the package becoming full,

terminating the traverse of the advancing yarn and then depositing the yarn on the rotating full package on said winding spindle in an axially narrow region of the package surface so as to form a yarn accumulation,

severing the advancing yarn to form a free yarn end, and

pressing the free yarn end into the yarn accumulation on the surface of the rotating package, and such that the free yarn end is secured to the package and is easily locatable.

11. An apparatus for winding a continuously advancing yarn onto a rotating bobbin to form a yarn package, and comprising

a spindle adapted to coaxially mount a bobbin,

means for rotating the spindle and a bobbin mounted thereon,

means for winding the advancing yarn onto a rotating bobbin which is mounted on said spindle while traversing the yarn at a location upstream of the bobbin to thereby form a rotating cross wound package,

means for terminating the traverse of the advancing yarn and then depositing the yarn on the rotating package in an axially narrow region of the package surface so as to form a yarn accumulation,

means for severing the advancing yarn to form a free yarn end, and

means for pressing the free yarn end into the yarn accumulation on the surface of the rotating package while mounted on the spindle, and such that the free yarn end is secured to the package and easily locatable.

5,588,602

PACKAGE CHANGING SYSTEM FOR SUPPLYING AND DISCHARGING LOADED AND EMPTY PACKAGES TO AND FROM A MACHINE FRAME

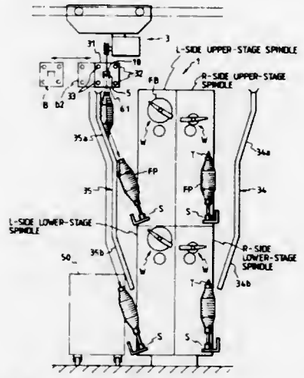
Toshiyuki Uno, Kusatsu, and Yasuhiko Kubota, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 14, 1994, Ser. No. 195,477

Claims priority, application Japan, Feb. 16, 1993, 5-051492; Jul. 13, 1993, 5-172888

Int. Cl.[6] D01H *9/10;9/14*

U.S. Cl. 242—35.50 A **11 Claims**



1. A package changing system having:

a first rail vertically movable parallel with a plurality of horizontal rows of spindles for which empty packages and full-loaded packages are to be replaced with each other;

a second rail connected to said first rail in a raised position of said first rail; and

a conveyance unit for travel along said second rail having means for changing packages and for entering and leaving said first rail.

5,588,603

YARN TAKE-UP TUBE SUPPLYING APPARATUS FOR A WINDER

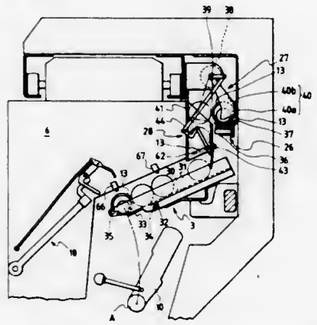
Fumiaki Nakaji, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 6, 1995, Ser. No. 468,752

Claims priority, application Japan, Jun. 13, 1994, 6-155256

Int. Cl.[6] B65H *54/02;63/00*

U.S. Cl. 242—35.5 A **5 Claims**



1. A yarn take-up tube supplying apparatus for a winder, comprising:

a winder having a number of winding units in a row;

a doffing device movably positioned at the side of said winder for transferring yarn take-up tubes;

a storage means for storing take-up tubes, said storage means being provided on each of said winding units;

conveyor means provided along said winder and above said storage means for supplying said yarn take-up tubes to said storage means; and

drop-in means for dropping the yarn take-up tubes conveyed by said conveyor means into said storage means, said drop-in means including dampening means for engaging and releasing each of said tubes as said tubes are dropped in said drop-in means from said conveyor into said storage means.

5,588,604

DEVICE FOR TRANSPORTING YARN WITH A CENTRAL MAST

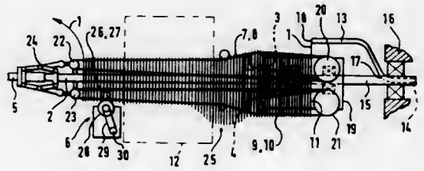
Gerhard Vetter, Süssen, and Eberhard Markert, Rechberghausen, both of Germany, assignors to Michael Horauf Maschinenfabrik GmbH & Co. KG, Donzdorf, Germany

Filed Apr. 12, 1995, Ser. No. 420,766

Claims priority, application Germany, Apr. 12, 1994, 44 12 433.3

Int. Cl.[6] B65H *51/24*

U.S. Cl. 242—47.05 **25 Claims**



1. A device for transporting yarn, comprising:

a central mast,

a plurality of circulating transport belts carried by the central mast, said plurality of transport belts exhibiting yarn support runs which extend longitudinally of the central mast and which are arranged such that they form corners of a polygonal form,

a belt drive for driving the transport belts,

a yarn winding device for winding yarn in controlled loops around the central mast and transport belts,

a first central mast support disposed at a central mast end adjacent the yarn winding device, and

a second central mast support disposed spaced from the first mast support in a travel direction of the yarn, said second central mast support including at least one supported roller carried by the central mast, at least one supporting roller having a circumferential support surface engaging a circumferential surface of an associated one of the at least one supported rollers, and a supporting roller drive mechanism for rotatably driving the at least one supporting roller, said supporting roller drive mechanism being independent from the belt drive,

wherein said belt drive and said supporting roller drive are operable to drive the supporting roller and supported roller with circumferential speeds synchronized with the belt speeds.

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5,588,605

BRAKING FORCE ADJUSTING DEVICE IN A FISHING REEL

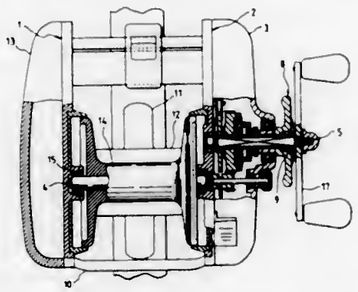
Nobuyuki Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 7, 1994, Ser. No. 301,886

Claims priority, application Japan, Sep. 8, 1993, 5-053616 U

Int. Cl.[6] A01K *89/015;89/02*

U.S. Cl. 242—268 **13 Claims**



1. A braking force adjusting device in a fishing reel in which an adjuster adjusts the braking force of a drive gear which is rotatably mounted on and frictionally coupled through a braking member to a handle shaft to the end of which a handle is connected, said adjuster being threadably engaged with said handle shaft so as to be freely moved back and forth along a longitudinal axis of said handle shaft, comprising an improvement wherein:

said adjuster includes an operation member adapted to be turned with an operator's fingers, and a threaded engaging member, said operation member and said threaded engaging member being formed separately from each other;

said threaded engaging member is axially slidingly received and non-rotatably fitted in a fitting recess which is formed in said operation member, said threaded engaging member comprising at least one outer planar surface extending an entire axial length of said threaded engaging member, said outer planar surface contacting said fitting recess along at least one inner planar surface formed on said operation member to prevent relative rotation therebetween, wherein said planar surface permits said threaded engaging member to slide axially relative to said operation member; and

an engaging portion adjacent to said fitting recess is adapted to push said braking member.

5,588,606

COVER OF TAPE CARTRIDGE AND ASSEMBLY METHOD OF SAME CARTRIDGE

Shuichi Kikuchi, and Shintaro Higuchi, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 428,517, Apr. 25, 1995. This application Jan. 31, 1996, Ser. No. 594,699

Claims priority, application Japan, Apr. 28, 1994, 6-091672

Int. Cl.[6] G11B *23/04;23/087*

U.S. Cl. 242—347 **5 Claims**

1. A method of assembling a tape cartridge, comprising the following steps:

applying grease to portions of a base plate with which portions a drive roller and a corner roller are respectively in contact;

assembling the drive roller, the corner roller and a hub to the base plate;

temporarily fixing a cover to the base plate in a state where a main body of the cover is separated from the base plate, the cover having at least one pin for temporarily fixing the cover to the base plate, the pin extending from the main body of the cover and having a first engagement portion and a second engagement portion which are located at a tip end section of the pin, the first engagement portion being located between the cover main body and the second engagement portion, wherein said temporarily fixing includes engaging the second engagement portion with an engaging section formed in the base plate;

removing the cover from the base plate;

winding a tape on the hub;

cutting off and removing the second engagement portion of the pin; and

provisionally fixing the cover to the base plate, wherein said provisionally fixing includes engaging the first engagement portion of the pin with the engaging section of the base plate.

5,588,607

APPARATUS WITH A DRIVE ARRANGEMENT OF INFORMATION CARRIERS IN THE FORM OF TAPES

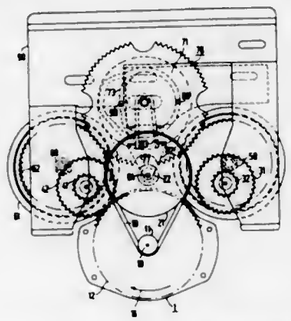
Arthur R. Van Es; Gerard Van Engelen; Theodorus H. M. De Nier, and Johannes F. Hoefnagels, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1995, Ser. No. 394,978

Claims priority, application European Pat. Off., Mar. 2, 1994, 94200528

Int. Cl.[6] G11B *15/44*

U.S. Cl. 242—356.3 **20 Claims**



1. An apparatus comprising a drive arrangement for winding an information carrier in the form of a tape between a first reel hub and a second reel hub and vice versa, which apparatus comprises

a motor having a motor shaft drivable in a positive direction of rotation and an opposite negative direction of rotation

a first drive spindle for driving the first reel hub and including a first spindle wheel,

a second drive spindle for driving the second reel hub and including a second spindle wheel,

a first, a second, a third and a fourth transmission device, respectively, comprising a first, a second, a third and a fourth set of drive wheels, each set of drive wheels including one of the spindle wheels and being directly drivable by said motor, which transmission devices are switchable between inactive and active states and respectively serve for the motor shaft to drive

the first drive spindle with a first transmission ratio,

the second drive spindle with a first transmission ratio,

the first drive spindle with a second transmission ratio, and

the second drive spindle with a second transmission ratio,

switching mechanisms for switching the first, the second, the third and the fourth transmission device between active and inactive states,

a rotatable cam disc having guide surfaces which cooperate with at least one switching mechanism, and

a cam disc drive wheel for driving the cam disc, the cam disc being rotatable to a plurality of stop positions each corresponding to one of the states of one of the transmission devices while at the same time the other transmission devices are in their inactive states, characterised in that:

said states of the first, the second, the third and the fourth transmission device are determined exclusively by the cam disc, and

the cam disc is rotatable both in a clockwise direction of rotation and in an opposite counterclockwise direction of rotation and cooperates with the switching mechanisms in each of the directions of rotation of the cam disc.

5,588,608

PRETENSIONER

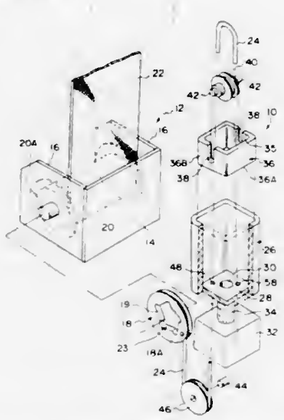
Keisuke Imai; Keiichi Kato; Takayuki Ando; Fuminori Teraoka, and Kenji Matsui, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi-ken, Japan

Filed Aug. 24, 1994, Ser. No. 294,917

Claims priority, application Japan, Aug. 30, 1993, 5-046979 U

Int. Cl.[6] B60R *22/46*

U.S. Cl. 242—374 **15 Claims**



1. A pretensioner which forcibly rotates a webbing take-up shaft when a vehicle suddenly decelerates and which tenses a webbing in a direction of restraining a vehicle occupant, comprising:

a rotating drum connected to an axial end portion of said webbing take-up shaft via a clutch mechanism;

a frame including a support plate and a pair of opposing leg plates for rotatably supporting said take up shaft;

a cylinder having sidewalls into which gas, which is generated when the vehicle suddenly decelerates, flows;

a piston having a bottom and sidewalls, and being slidably disposed within said cylinder and, said bottom of said piston receiving gas pressure of the gas which flows into said cylinder to slide within said cylinder;

a movable pulley which is axially, rotatably supported inside of said piston;

a wire, one end of said wire being wound around said rotating drum, another end of said wire being fixed to a bottom portion of said cylinder, and an intermediate portion of said wire being trained around said movable pulley, said wire containing doubled-back portions before and after a portion around said movable pulley, and extending through said bottom of said piston inside said cylinder, said doubled back-portions being parallel with each other, and disposed within said cylinder,

a fixed pulley exterior of said cylinder for changing the direction of movement of said wire between said movable pulley and said rotating drum,

wherein said sidewalls of said cylinder are mounted adjacent to said frame side by side to each other such that the diameter dimension of said take-up shaft is located within a range of a height of the cylinder for increasing the compactness of said pretensioner, and

wherein said parallel portion of said doubled-back portions of said wire nearest to said take-up shaft extends through said cylinder and engages said direction-changing fixed pulley for further increasing the compactness of the pretensioner.

5,588,609

SEAT BELT WINDING DEVICE

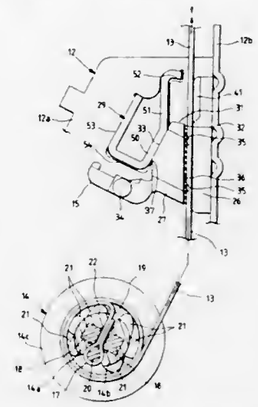
Sadanori Ohsumi, Kanagawa, Japan, assignor to NSK Ltd., Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 419,989

Claims priority, application Japan, Apr. 13, 1994, 6-097891; Apr. 18, 1994, 6-101701

Int. Cl.[6] B60R *22/28;22/42*

U.S. Cl. 242—376 **20 Claims**



14. A seat belt winding device for a webbing in a vehicle, comprising:

a retractor base;

a winding shaft rotatably supported by the retractor base; and

a bobbin rotated integrally with the winding shaft, the bobbin including a plastically deforming member on an outer periphery of the bobbin, the plastically deforming member being of a strength to be deformed by a load acting on the webbing which exceeds a first predetermined value:

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clamping means disposed in the retractor base for directly holding the webbing in an emergency of the vehicle, the clamping means releasing the webbing from holding when a load acting on the webbing exceeds a second predetermined value.

5,588,610

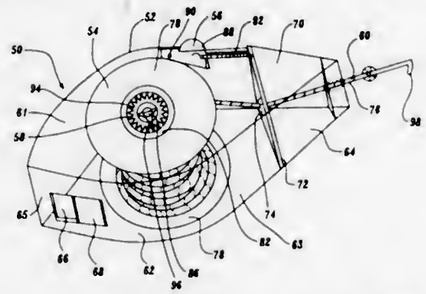
POWER STRING AND CHALK LINE

Daniel McGee, P.O. Box 26, Greenbank, Wash. 98253

Continuation-in-part of Ser. No. 393,080, Feb. 23, 1995, abandoned. This application Jul. 18, 1995, Ser. No. 503,816

Int. Cl.[6] B44D *3/38*

U.S. Cl. 242—379 **7 Claims**



1. A straight line or chalk line tool for obtaining a straight line reference using a line having a wound end and a free end, comprising:

(a) a housing having an upper face and a lower face, a support rod mounted between the upper and the lower face, and a line aperture;

(b) a spool, having two end plates separated by a hollow axle, sized to fit within the housing and rotatably mounted about the support rod inside the housing, such that the wound end of the line can be wound around the spool and the free end of the line can be pulled from the housing via the line aperture;

(c) a coil spring, affixed to the spool, for maintaining rotational tension on the spool, such that as the free end of the line is pulled from the spool, the rotational tension of the spring increases, biasing the spool against removal of the line from the spool and toward rewinding line onto the spool; and

(d) a slip-lock means that allows continuous movement of the spool in either direction, but restricts movement of the spool if continuous movement of the spool is halted.

5,588,611

RETRACTOR WITH A CLAMPING MECHANISM

Sadanori Osumi; Kiyoshi Ogawa; Toshifumi Taguchi, all of Kanagawa, and Mutsumu Haraoka, Aichi, all of Japan, assignors to NSK Ltd., Tokyo, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Mar. 7, 1995, Ser. No. 399,634

Claims priority, application Japan, Mar. 10, 1994, 6-065441; Mar. 10, 1994, 6-065443; Mar. 10, 1994, 6-066557

Int. Cl.[6] B60R *22/42*

U.S. Cl. 242—381.1 **22 Claims**

1. A retractor with a clamping mechanism for directly holding a webbing in an emergency vehicle, comprising:

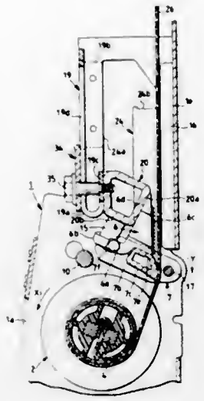
a retractor base;

a lower plate fixed to the retractor base;

a movable clamp member for holding a webbing between the lower plate and the clamp member;

a guide member for guiding the clamp member to a webbing holding position; and

a holding means for preventing a movement of the guide member in a webbing draw-out direction, the holding means



including a plastically deforming portion which is deformed in accordance with a further movement of the clamp member in the webbing draw-out direction beyond the webbing holding position;

wherein the guide member is fixed to the holding means so that the clamp member is moved in the webbing draw-out direction, while the clamp member holds the webbing, by deforming the plastically deforming portion of the holding means in accordance with the further movement of the clamp member in the webbing draw-out direction when a tensile force exceeding a predetermined value acts on the webbing.

5,588,612

SAFETY BELT BLOCKING DEVICE WITH SELF-BLOCKING PREVENTION

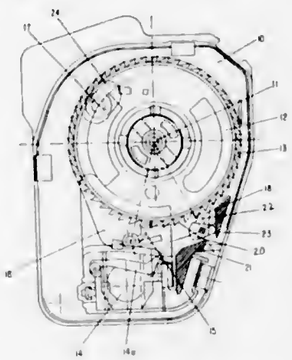
Ulrich Laun, Drage, Germany, assignor to Autoliv Development AB, Vargarda, Sweden

Filed Dec. 15, 1995, Ser. No. 573,255

Claims priority, application Germany, Dec. 15, 1994, 44 44 655.1

Int. Cl.[6] B60R *22/405;22/41;22/42*

U.S. Cl. 242—383.1 **4 Claims**



1. A blocking device for a safety belt; said blocking device comprising:

a safety belt retractor with a housing and a belt reel for receiving the safety belt, said belt reel positioned in said housing;

said safety belt retractor having a control wheel with outer toothing, said control wheel fixedly connected to said belt reel so as to rotate with said belt reel;

a control plate pivotable between a disengaged position and a blocking position upon withdrawing the safety belt from said belt reel, in which blocking position said control plate triggers blocking of safety belt withdrawal;

a safety-belt-sensitive control means acting on said control wheel, said safety-belt-sensitive control means comprising a first sensor pawl for coupling said control wheel and said control plate when said safety-belt-sensitive control means is triggered;

a vehicle-sensitive control means acting on said control wheel, said vehicle-sensitive control means comprising a second sensor pawl mounted on said control plate, said second sensor pawl engaging said toothing of said control wheel when said vehicle-sensitive control means is triggered;

a pilot pawl pivotably connected to said control plate, said pilot pawl pivotable between a rest position and an abutment position, wherein said pivot pawl is moved from said rest position into said abutment position, when said control plate is rotated from said disengaged position into said blocking position;

wherein said pilot pawl in said abutment position secures said control plate upon return from said blocking position into said disengaged position in an intermediate position before reaching said disengaged position in which intermediate position a relative movement between said control wheel and said control plate is possible; and

wherein due to said relative movement said first and second sensor pawls are released, subsequently said pilot pawl is returned into said rest position, and said control plate is returned into said disengaged position.

5,588,613

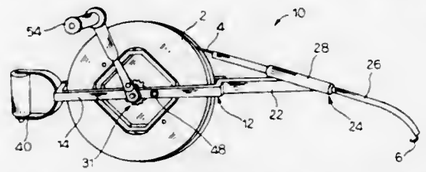
FISH TAPE REEL ATTACHMENT APPARATUS USED IN COMBINATION WITH A FISH TAPE REEL

Peter Nagy, 24761 Nellie Gail Rd., Laguna Hills, Calif. 92653

Filed Mar. 27, 1995, Ser. No. 411,269

Int. Cl.[6] B65H *57/12;75/40;* **H02G** *1/08*

U.S. Cl. 242—395 **15 Claims**



1. A fish tape reel attachment apparatus used in combination with a fish tape reel which has an elongated stiff, resilient tape wound on the reel and having means on one end thereof to which a length of wire may be secured to be pulled through a conduit, the apparatus comprising:

a. a generally rectangular shaped frame member having a pair of opposite transverse parallel bars connected at their ends to a pair of opposite longitudinally elongated parallel bars and forming a space therebetween, one of the pair of opposite longitudinally parallel bars being removably detachable for installing said fish tape reel within the space of the frame member;

b. an internal hub member mounted between said pair of longitudinally parallel bars such that said fish tape reel is fitted onto the internal hub member;

c. a gear mechanism including a large gear wheel meshed with a small gear wheel, the large gear wheel mounted on a first shaft which in turn interconnects, and is located adjacent, to said internal hub member for rotating said internal hub member at a higher torque, the first shaft mounted between said pair of longitudinally parallel bars and having first connection means, the small gear wheel mounted on a second shaft which in turn is mounted to the other one of said pair of longitudinally parallel bars for rotating said large gear wheel which in turn rotates said internal hub member at a lower torque, the small gear wheel having second connection means;

d. a ratchet mechanism for connecting to said first connection means or said second connection means to rotate said large gear wheel or said small gear wheel which in turn rotates said internal hub member, which in turn rotates said fish tape reel, the ratchet mechanism having a handle for grasping thereon;

e. an elongated protruding shaft support attached to one of said pair of transverse parallel bars and extending in a longitudinal direction and parallel to said pair of longitudinally parallel bars;

f. a hollow cylindrical shaped exterior pipe attached to said protruding shaft support at an angle;

g. an elongated hollow cylindrical shaped interior pipe having a bent front end rotatably press-fitted within said hollow exterior pipe, where said tape is inserted through the hollow interior pipe and extends out the bent front end for attaching to the length of wire; and

h. a handle member affixed to the other one of said pair of transverse parallel bars for holding said fish tape reel attachment apparatus;

i. whereby said apparatus enables a user to orient the direction of said tape of said fish tape reel in the appropriate oriented direction and then hold said apparatus in one hand and rotate it with the ratchet motion in the other hand so that substantial additional force can be applied to pull the length of wire through the conduit and to pull it through bends and areas where it may be difficult to pull the length of wire through the conduit, thereby enabling the rotation of said ratchet mechanism to provide far more force to be applied.

5,588,614

ELECTRONIC-COMPONENT SUPPLYING CARTRIDGE

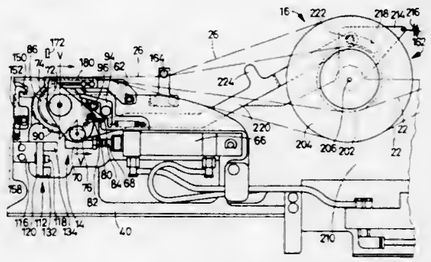
Yukinori Takada, Anjo; Tokiyuki Kuno, Nagoya; Yasuo Muto, Chiryu, and Koichi Asai, Nagoya, all of Japan, assignors to Fuji Machine Mfg. Co., Ltd., Aichi-ken, Japan

Filed Jul. 3, 1995, Ser. No. 497,750

Claims priority, application Japan, Jul. 7, 1994, 6-156246

Int. Cl.[6] B65H *20/02*

U.S. Cl. 242—538.2 **13 Claims**



1. A cartridge for supplying a carrier tape which carries a plurality of electronic components, the tape having a plurality of pockets for accommodating the respective components, and a pair of side portions on both sides of the pockets, the pockets projecting downward from the side portions, the cartridge comprising:

a cartridge frame;

a tape feeding device mounted on said cartridge frame, for feeding said carrier tape in a feeding direction;

a pair of rails provided on said cartridge frame such that said rails extend parallel to said feeding direction, said pair of rails supporting said pair of side portions of said carrier tape, respectively, and permitting movement of said pockets of the tape when the tape is fed on the rails by said tape feeding device;

a tape positioning device which positions said carrier tape with respect to a lateral direction in which said pair of side portions of the tape are spaced from each other; and

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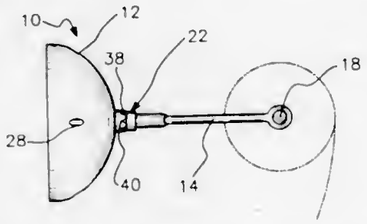
a rail adjusting device which adjusts a spacing between said pair of rails to each of a plurality of different values.

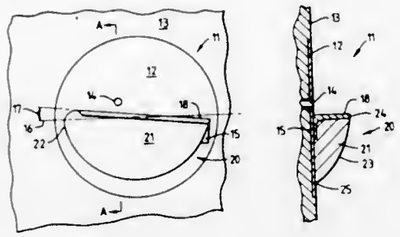
5,588,615
ROTATABLE PAPER ROLL HOLDER
Curtis L. Batts, 407 S. Alexander Ave., Duncanville, Tex. 75116
Filed Mar. 24, 1995, Ser. No. 409,430
Int. Cl.[6] B65H *19/10*
U.S. Cl. 242—598.3 **5 Claims**



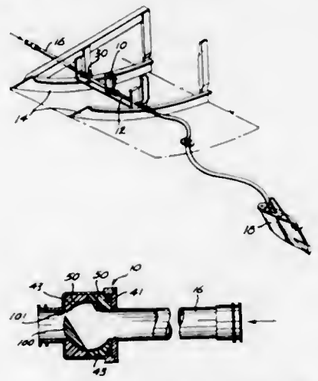
1. A rotatable paper roll holder comprising:
a mounting means for securing said roll holder to a support surface;
a yoke including spaced lateral yoke arms;
a spindle removably positioned between the lateral yoke arms of the yoke;
an adjustable angle coupling means interposed between the mounting means and the yoke for supporting the yoke relative to the mounting means and permitting selective rotation of the yoke about an axis directed through the mounting means and orthogonally intersecting a longitudinal axis of the spindle,
wherein the mounting means comprises a mounting boss defining a hollow interior with the adjustable angle coupling means being secured to the mounting boss, and
wherein the mounting boss includes an axle aperture directed therethrough, and further wherein the adjustable angle coupling means comprises an axle guide projecting from the mounting boss and positioned over the axle aperture extending through the mounting boss; an axle projecting from the yoke and extending through the axle guide and into the hollow interior of the mounting boss; an end cap secured to a free distal end of the axle within the hollow interior of the mounting boss; a spring interposed between the end cap and an interior surface of the mounting boss for biasing the yoke against an exterior surface of the axle guide.

5,588,616
STATIC VENT UNITS
Terrence L. Perkins, Yeovil, England, assignor to Westland Helicopters Limited, Yeovil, England
Filed Oct. 3, 1994, Ser. No. 316,465
Claims priority, application United Kingdom, Oct. 7, 1993, 9320678
Int. Cl.[6] B64D *45/00*
U.S. Cl. 244—1 R **11 Claims**

1. A static vent unit located in the side of a helicopter fuselage with an outer surface of a support plate substantially flush with a surface of the fuselage, a circular vent port through the plate and an elongated strake extending substantially horizontally below the vent port with an upper surface facing the vent port and extending generally perpendicular to said support plate surface, and further including airflow deflection means independent of said elongated strake, said airflow deflection means being located below the strake to deflect airflow away from the perpendicularly extending portion of the strake when the unit is operating in airflow at a positive incidence as herein defined.



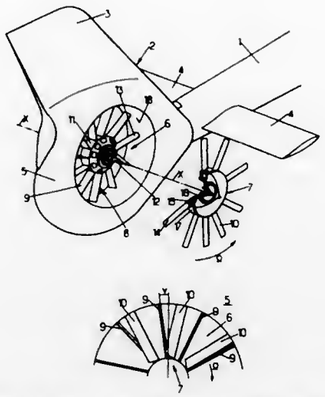
5,588,617
MOTOR OPERATED RESTRICTOR VALVE
Daniel L. Bliss, Wichita, Kans.; Steven E. Marshall, Renton, and Michael I. Ruby, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Division of Ser. No. 48,028, Apr. 14, 1993, Pat. No. 5,574,101.
This application Jan. 17, 1995, Ser. No. 373,812
Int. Cl.[6] B64D *45/00*
U.S. Cl. 244—1 N **2 Claims**



1. A method for preventing noise from entering the cabin of an aircraft through drain openings comprising the steps of inserting a motor operated restrictor valve between a drain hose and a drain mast;
spring loading said restrictor valve to an open position to provide full flow of fluid between said drain hose and said drain mast; and then
applying power to said motor operated restrictor valve, thereby producing a shock wave to block noise from entering the cabin.

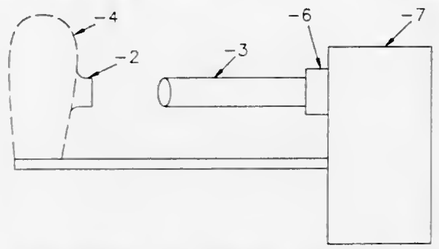
5,588,618
COUNTER-TORQUE DEVICE WITH ROTOR AND FLOW-STRAIGHTENING STATOR, BOTH OF WHICH ARE DUCTED, AND PHASE MODULATION OF THE BLADES OF THE ROTOR, FOR HELICOPTER
Henri-James R. Marze, Rognac; Vincent Jean-Luc Routhieau, Aix-En-Provence; Gilles L. Arnaud, Marseille, and Rémy E. Arnaud, Vitrolles, all of France, assignors to Eurocopter France, Marignane Cedex, France
Filed Aug. 30, 1994, Ser. No. 298,080
Claims priority, application France, May 4, 1994, 94 05478
Int. Cl.[6] B64C *27/82*
U.S. Cl. 244—17.19 **15 Claims**

1. Counter-torque device for a helicopter, comprising a variable-pitch multi-blade rotor mounted so that it can rotate substantially coaxially in a duct for a flow of air of axis substantially transversal



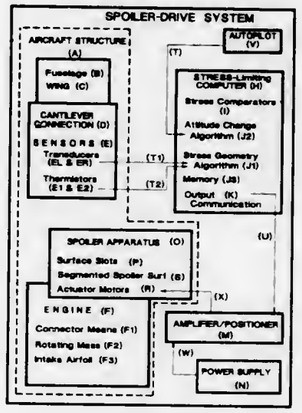
to the helicopter and passing through a fairing incorporated into the tail part of the helicopter, so that the pitch change axes of the blades move in a plane of rotation substantially perpendicular to the axis of the fairing duct, as well as a flow-straightening stator fixed into the duct downstream of the rotor and including stationary vanes located substantially in a star configuration about the axis of the duct and each exhibiting an asymmetric aerodynamic profile, of which the camber and the angular setting with respect to the axis of the duct are such that the vanes straighten out the airflow downstream of the rotor substantially parallel to the axis of the duct, wherein the blades of the rotor are distributed angularly about the axis of the rotor with uneven azimuth modulation, such that any angle between any two arbitrary blades of the rotor is different from any angle between any two arbitrary vanes of the flow-straightener.

5,588,619
PROPELLER SYNCRO-PULSING
Leroy LoPresti, 2050 13th, and Jim LoPresti, 2620 Airport N. Dr., both of Vero Beach, Fla. 32960
Filed Nov. 21, 1994, Ser. No. 343,042
Int. Cl.[6] B64C *11/00*
U.S. Cl. 244—53 R **1 Claim**



1. An improvement in the combination of an aircraft propeller and an internal combustion engine comprising:
said aircraft propeller providing a high energy wake at its trailing edge which travels aft in a helical pattern and provides a driving thrust, and said aircraft propeller being driven by said internal combustion engine;
said improvement comprising: said internal combustion engine having an induction inlet in close proximity to a portion of said propeller, said propeller having a blade extension located on said propeller at said portion in close proximity to said induction inlet and said propeller being indexed in relation to the opening and closing of an inlet valve of said internal combustion engine such that an impulse of air created by said blade extension will enter said induction inlet and arrive at said intake valve when it is open, thereby resulting in an additional power increase from said internal combustion engine.

5,588,620
RADIAL-FORCE SPOILER SYSTEM
Raymond D. Gilbert, 6501 Inwood Dr., Springfield, Va. 22150
Continuation-in-part of Ser. No. 935,284, Aug. 26, 1992, Pat. No. 5,445,346, and Ser. No. 158,749, Nov. 26, 1993, Pat. No. 5,458,304. This application Dec. 1, 1994, Ser. No. 296,668
Int. Cl.[6] G05D *1/08;* **B64C** *5/10;9/00*
U.S. Cl. 244—90 A **14 Claims**



1. In an aircraft comprised of a fuselage, wing, engine, autopilot and electric power supply, a stress reduction apparatus further comprising:
segmented spoiler apparatus,
mounted at the front of the engine,
sensor means, and
stress-limiting computer means;
wherein segmented spoiler means are located in concave arcs along a line parallel to an air entry mouth of the jet engine, and
wherein sensor means generate data that is processed by the stress-limiting computer means to actuate segmented spoilers with amplitude and timing sufficient to minimize accumulated stress within aircraft structures.

5,588,621
UNIVERSAL MOUNTING APPARATUS AND METHOD FOR BAR CODE SCANNERS
Donald A. Collins, Jr., Duluth, and Rex A. Aleshire, Buford, both of Ga., assignors to AT&T Global Information Solutions Company, Dayton, Ohio
Filed Feb. 23, 1995, Ser. No. 392,581
Int. Cl.[6] G12B *9/00*
U.S. Cl. 248—27.1 **4 Claims**

1. A mounting apparatus for a replacement bar code scanner comprising:
a cover plate having a size large enough to cover an aperture in a checkout counter created for a removed bar code scanner which is larger than the replacement bar code scanner, wherein the cover plate also has a bottom surface; and
a support member which fastens to the bottom surface of the cover plate and which suspends the replacement bar code scanner from the bottom surface of the cover plate within the

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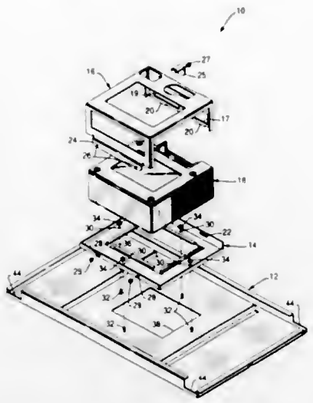
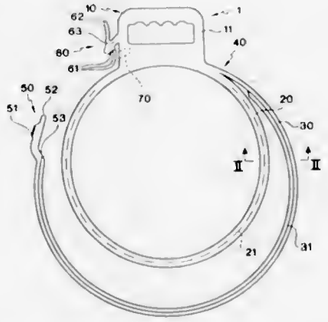


aperture, including a box-like enclosure, including a base portion containing the replacement bar code scanner and a lid portion which fastens to the base portion and to the bottom surface of the cover plate.

5,588,622
BAG HOLDER
M. Brian Gordon, Sr., 403 N. Main St., P.O. Box 392, Columbiana, Ala. 35051-0392
Filed Jan. 17, 1995, Ser. No. 373,393
Int. Cl.[6] B65B *67/04*
U.S. Cl. 248—101 **17 Claims**



1. A one piece bag holder device, comprising:

a closed inner ring having a handle portion attached to a periphery thereof;

an open outer ring attached to said closed inner ring at a hinge portion which is adjacent to said handle portion on a first side of said handle portion;

locking means for engaging a second end of said open outer ring on a second side of said handle portion opposite said first side; and

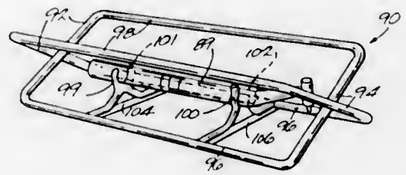
a socket portion for receiving a handle;

wherein said open outer ring is adapted to be wrapped around a periphery of said closed inner ring in order to secure a bag therebetween and is locked in place by said locking means;

wherein said bag holder device is made of one piece of plastic; and

wherein said locking means includes an outer ring locking member disposed on an end of said open outer ring, and a base locking member, wherein said base locking member and said outer ring locking member engage with each other to firmly secure said open outer ring around the periphery of said closed inner ring.

5,588,623
STERILIZATION SYSTEM
Steven Leduc, 10807 E. Harvard Dr., Aurora, Colo. 80014
Division of Ser. No. 104,981, Aug. 10, 1993, Pat. No. 5,364,602. This application Nov. 14, 1994, Ser. No. 338,689
Int. Cl.[6] F16M *11/00*
U.S. Cl. 248—164 **3 Claims**



1. A device for supporting medical or dental instruments to be sterilized in a sterilization chamber, said instruments having first and second ends, comprising:

an elongated frame with leg portions for supporting the frame on a flat surface, said frame having first and second X-shaped end members connected by elongated intermediate members, an instrument supporting member on said first end for engaging the first end of said instrument,

a second instrument supporting member at the second end of said frame, said second instrument supporting member and having opposed ends biased toward one another, and facing surfaces on said ends adapted to engage the second end of said instrument, said biasing force being sufficient to support said second end of said instrument,

said instrument engaging members being slidably movable along to said elongated members, whereby the space between the first and second instrument engaging members can be adjusted.

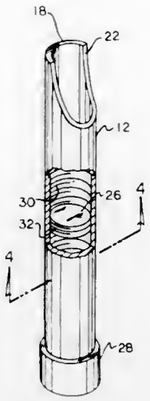
5,588,624
TABLE LEG EXTENSION
Annie R. Woodham, 297 Batiste Way, Jonesborn, Ga. 30236
Filed Apr. 5, 1995, Ser. No. 417,194
Int. Cl.[6] F16M *11/24*
U.S. Cl. 248—188.4 **5 Claims**

1. A table leg extension comprising:

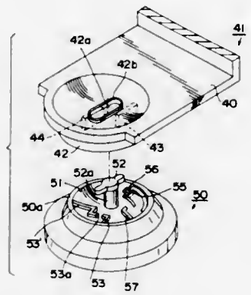
a receiving tube adapted for receiving a leg of a table, the receiving tube being shaped so as to define an upper end spaced from lower end, with an arcuate aperture directed into the upper end thereof, the arcuate aperture permitting the upper end of the receiving tube to be bent over an integral bend of the leg of the table, the receiving tube is shaped so as to define internal threads extending about an internal surface thereof;

an abutment plate mounted within the receiving tube and adapted to engage a lower end of the leg so as to support the lower end of the leg in a spaced relationship relative to the lower end of the receiving tube, and the abutment plate is shaped so as to define external threads which are threadably engaged to the internal threads of the receiving tube so as to define an adjustment means, the adjustment means adjustably positioning the abutment plate relative to a ground surface;

an elastomeric foot secured to the lower end of the receiving tube for engaging a ground surface.



5,588,625
MONITOR STAND ASSEMBLY
Soon-ki Beak, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Aug. 16, 1995, Ser. No. 515,896
Claims priority, application Rep. of Korea, Aug. 16, 1994, 94-20087
Int. Cl.[6] A47G *29/00*
U.S. Cl. 248—371 **4 Claims**

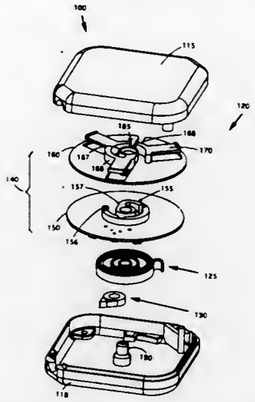


1. A monitor stand assembly having an upper stand portion for seating a monitor thereon, a stand base portion supporting the upper stand portion, said assembly providing lateral rotation and vertical tilt movement for adjustability of a user's viewing position, the improvement comprising:

the upper stand portion having a horizontal locking aperture formed therein and having first and second guide ribs protrudently disposed in a diagonally opposed relation to one another and said locking aperture; and

the stand base portion having a coupler securely fixed in a vertical orientation in a substantially centered area for coupling to said locking aperture and thereby providing vertical tilt movement of the upper stand portion relative to the stand base portion, the stand base portion also including a first control rib located on one side of said coupler and a second control rib located diametrically across said coupler, said second control rib including an upwardly protrudent rib integrally formed on a movable resilient tab, said first and second control ribs configured to cooperate with said first and second guide ribs for controlling the rotational angle of the upper stand portion relative to the stand base portion in a lateral direction.

5,588,626
FLEXIBLY ADAPTABLE AND REMOVABLE CABLE WINDING AND COLLECTING APPARATUS
Dah-Rong Yang, Tao-Yuan, Taiwan, assignor to Delta Electronics, Inc., Taipei, Taiwan
Filed May 16, 1995, Ser. No. 442,315
Int. Cl.[6] B65H *75/48*
U.S. Cl. 242—378.1 **8 Claims**



1. A bi-level both-end wire collecting drum adaptable to a wire winding and collecting apparatus for engaging a rotation force asserting means for rotational winding and collecting a wire therein, said wire collecting drum comprising:

a bottom wire collecting means including a bottom spindle with a bottom wire collecting ridge disposed substantially in a central portion of said bottom spindle;

a top wire collecting means including a top spindle with a top wire collecting ridge disposed substantially in a central portion of said top spindle;

said top spindle including a tilted surface portion having a slightly tilted surface for constituting a wire adapting and removing opening extended axially from said center portion of said top spindle to an outer edge;

said top wire collecting ridge in said center portion of said top spindle constituting a partial top circular ridge having a top ridge opening disposed at said wire adapting and removing opening; and

said bottom wire collecting ridge in said center portion of said bottom spindle constituting a partial bottom circular ridge having a bottom ridge opening aligned with said wire adapting and removing opening wherein said bottom wire collecting ridge securely engaging said top wire collecting ridge constituting a hi-level transition portion for allowing said wire to smoothly pass from said bottom wire collecting ridge to said top wire collecting ridge for smooth and continuous winding and collecting said wire therein.

5,588,627
PAPER ROLLER
Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Rancho Dominguez, Calif.
Filed Sep. 19, 1995, Ser. No. 530,482
Int. Cl.[6] B65H *75/02*
U.S. Cl. 242—599 **10 Claims**

1. A paper roll support for use with a pair of supporting brackets having cylindrically-shaped cavities for receiving an end of the support, said support comprising:

a generally tubular unitary member independent from the brackets, wherein the tubular member comprises at least two flexible pleated portions and a cylindrical portion positioned between the pleated portions.

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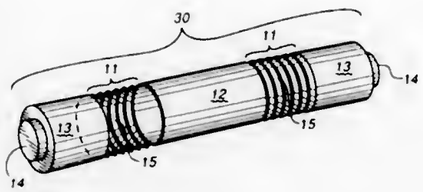
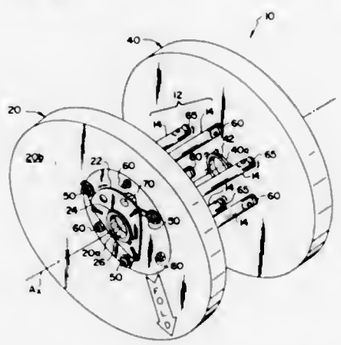


5,588,628
COLLAPSIBLE REEL
Harold G. Sachleben, 19 Adams Ave., Bellmawr, N.J. 08031
Filed Nov. 28, 1994, Ser. No. 348,985
Int. Cl.[6] B65H 75/24;75/22
U.S. Cl. 242—607.1 24 Claims



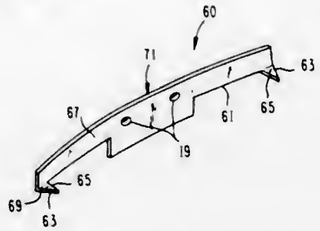
1. A collapsible reel comprising:

first and second flanges having respective facing inner surfaces;

a plurality of spaced members extending between, and being pivotally connected to, said inner surfaces to maintain said inner surfaces in mutually parallel planes, said members having respective longitudinal axes arranged parallel to one another, said members being connected to said first flange about respective pivot axes which extend parallel to said inner surface of said first flange, said plurality of members comprising at least one first member and at least one second member; and

an actuator member engaged with said at least one first member and movable between first and second positions for rotating said at least one first member about said longitudinal axis thereof between, respectively: (1) a first rotational position in which said pivot axis of said at least one first member is in nonparallel relationship with the corresponding pivot axis of said at least one second member, and (2) a second rotational position in which said pivot axis of said at least one first member is in parallel relationship with the corresponding pivot axes of the remaining members, thereby permitting collective pivotal movement of said members with respect to said flanges between a collapsed position when said second rotational position is obtained, at which said flanges are positioned substantially adjacent to one another, and an operative position at which said flanges are spaced such that the planes of said inner surfaces are perpendicular to said longitudinal axes of said members, said flanges being retained in said operative position when said actuator member is moved to said first position.

5,588,629
WALL ARTICLE HANGING DEVICE
Renny H. Barnes, 8146 Crestridge Rd., Fairfax Station, Va. 22039
Filed May 22, 1995, Ser. No. 445,698
Int. Cl.[6] A47F 7/14
U.S. Cl. 248—475.1 19 Claims



1. A wall article hanging device for attaching an article to a wall surface comprising:

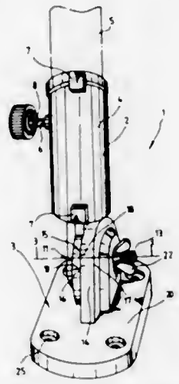
a) an elongated plate having an uppermost and a lower edge;

b) means extending outwardly from said plate for rigidly attaching said elongated plate to a rear surface of said article; and

c) at least a pair of spaced prongs integrally formed and extending outwardly from said elongated plate, each said prong having an upper and a lower planar face decreasing in width from said elongated plate to a terminating tip said tip being angled downwardly towards said lower edge such that each said lower planar face forms an acute angle with respect to a transverse section of said elongated plate, said prongs in opposing relationship with said means for rigid attachment and designed for penetration of and attachment to said wall wherein;

d) said elongated plate has spring qualities and has a bend from a center thereof towards each end, said spring qualities causing said elongated plate to flatten during attachment to said wall and spring back after said attachment to direct said prongs in a direction generally opposite said spring back.

5,588,630
ADJUSTABLE BASE TO HOLD FLAG BANNERS
Huang Chen-Chao, No. 20, Lane 124, Sec. 5, Hsin Hai Rd., Taipei, Taiwan
Filed Jan. 19, 1995, Ser. No. 374,826
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—514 2 Claims



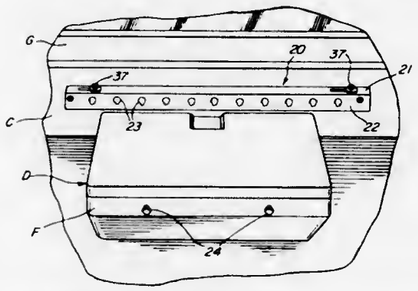
1. An adjustable base for holding a pair of flag banner poles, comprising:

a base including (1) a ground plate having a plurality of mounting holes formed therethrough for securement to a base surface, and (2) a base table extending orthogonally from a central portion of said ground plate, said base table having a centrally disposed first screw hole formed therethrough and a plurality of radially disposed first cogwheel teeth formed on one side thereof;

a pole cylinder adjustably coupled to said base, said pole cylinder including (1) a longitudinally extended tubular cylinder having an open upper end for receiving a first of the pair of flag banner poles therein, said tubular cylinder having a threaded opening formed through a side wall thereof adjacent said open end, (2) a first bolt threadedly engaged with said threaded opening for securing the first of the pair of flag banner poles within said tubular cylinder, (3) a connecting table extending from a lower end of said tubular cylinder, said connecting table having a centrally disposed second screw hole formed therethrough and a plurality of radially disposed second cogwheel teeth formed on one side thereof, and (4) a pair of longitudinally spaced loops formed on an external surface of said tubular cylinder for receiving a second of the pair of flag banner poles therein; and,

means for releasably coupling said connection table to said base table, said releasable coupling means including a second bolt extending through said first and second screw holes with said first cogwheel teeth facing said second cogwheel teeth and a nut threadedly engaged on said second bolt, wherein said tubular cylinder is angularly adjusted by rotation of said connection table relative to said base table and fixed thereat by tightening said nut on said second bolt.

5,588,631
LOCKING ARTICLE ANCHORING ASSEMBLY FOR TRUCK BEDS
William J. Yee, 4361 Keystone Ave., Culver City, Calif. 90232
Filed May 2, 1994, Ser. No. 236,171
Int. Cl.[6] A47F 7/00
U.S. Cl. 248—553 11 Claims



1. An assembly for anchoring articles such as storage boxes for tools to a structure, said assembly comprising:

a. a longitudinally elongated hollow beam member having a hollow interior space, said beam member having means for fastening said beam member to a structure and having a wall provided therethrough with at least a first perforation,

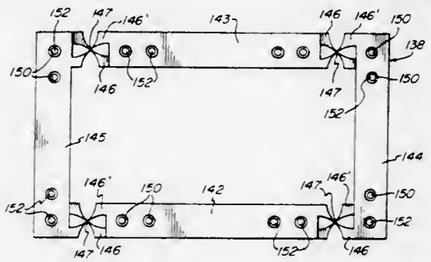
b. at least one article locking member fastenable to an article to be anchored, said locking member including an elongated portion having a smaller transverse section than said perforation and insertable therethrough, said elongated portion having proximate an outer transverse end thereof engagement means for lockable engagement to prevent removal of said elongated portion from said perforation,

c. a locking bar within said hollow interior space of said beam, said locking bar having therethrough a first cutout section alignable with and non-obstructing of said perforation through said wall of said beam with said locking bar in a first unlocked position permitting insertion of said elongated locking member through said perforation, said locking bar being slidable to a locking position in which portions of said locking bar obstruct a portion of said perforation, said obstructing portion of said locking bar lockingly engaging said lockable engagement means of said locking member protruding through said perforation, said locking bar being of sufficiently less longitudinal extent than said hollow beam member to permit said locking bar to be slid between said locking and unlocked positions without protruding from either end of said hollow beam member, said locking bar including an elongated plate section parallel and proximate to the inner surface of said perforated wall of said beam, said plate section having a second cutout section alignable with said perforation through said beam wall with said locking bar slid to a second unlocked position longitudinally spaced apart from said first unlocked position, and an elongated base section angled away from said plate section,

d. means for longitudinally slidably supporting said base section of said locking bar, and

e. slidable operating means located longitudinally between opposite transverse ends of said hollow beam for slidably moving said locking bar between said locking and unlocked positions.

5,588,632
DYNAMIC SUPPORT STRUCTURE
Peter R. Solomon, West Hartford, Conn., assignor to Advanced Fuel Research, Inc., East Hartford, Conn.
Continuation of Ser. No. 308,153, Sep. 19, 1994, abandoned, which is a division of Ser. No. 837,622, Jan. 19, 1992, Pat. No. 5,349,438, which is a continuation-in-part of Ser. No. 773,225, Oct. 19, 1991, Pat. No. 5,196,902. This application Dec. 4, 1995, Ser. No. 567,085
Int. Cl.[6] G01B 9/02
U.S. Cl. 248—560 4 Claims



1. Dynamic support structure, comprising a multiplicity of rigid members including a pair of opposing side members and a pair of opposing end members, said members being flexibly interconnected so as to provide a frame and to permit conjoint displacement of said side members in opposite directions along parallel axes of shifting, with said end members rotating in the same direction about pivot points, said structure comprising at least two planar pieces of similar configuration affixed in substantiality coextensive, superposed relationship and cooperatively providing at least one contiguous pair of said members consisting of a side member and an end member, and providing a flexible joint between said members of said contiguous pair, each of said planar pieces being of integrally formed, unitary construction and including first and second elongate elements having longitudinal axes and contiguous end portions, and a flexible web element joining said contiguous end portions and extending therebetween on an oblique axis to both of said longitudinal axes when said longitudinal axes are mutually perpendicular, said first elements of said two pieces together providing said side member of said contiguous pair, said second elements of said two pieces together providing said end member of said contiguous pair, and said web elements of

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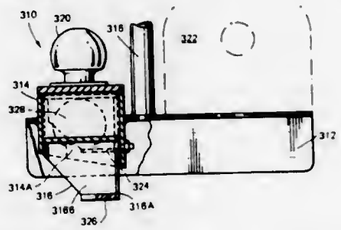
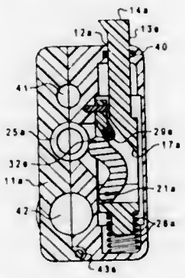
said two pieces together providing said flexible joint therebetween, said oblique axes crossing one another and thereby causing said web elements to constrain said member of said contiguous pair to relative movement about a single axis of flexure, disposed at the intersection of said oblique axes.

5,588,633
MOUNTING BRACKET
Alan I. McCrerie, Preston, Great Britain, assignor to Winch & Engineering Limited, Lancashire, Great Britain
PCT No. PCT/GB93/00077, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/14015, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 14, 1993, Ser. No. 256,546
Claims priority, application United Kingdom, Oct. 20, 1992, 9222015; Jan. 14, 1993, 9201015
Int. Cl.[6] B66D *1/00*; **B60F** *1/00*
U.S. Cl. 248—647 **8 Claims**



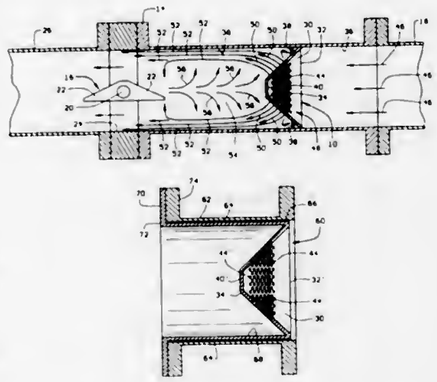
1. A mounting bracket, comprising:
a base plate; and
attachment means for loosely attaching the mounting bracket to a vehicle's ball hitch so that the mounting bracket may move relative to the ball hitch, said attachment means being in a form of a first housing, which is secured to the base plate and has a lower end defining an opening, and a second housing which is located within the first housing and is capable of sliding upwardly and downwardly relative thereto, said second housing providing a socket for fitting over a ball member of the ball hitch, and the weight of the mounting bracket acting under gravity to slide said first housing downwards over said second housing to a position where said first housing serves to retain the ball member within said socket.

5,588,634
FLUID FLOW CONTROL DEVICE PINCH MECHANISM
William S. Nettekoven, Sandy, Utah, assignor to MegaDyne Medical Products, Inc., Draper, Utah
Filed Dec. 11, 1995, Ser. No. 570,641
Int. Cl.[6] F16K *7/06*
U.S. Cl. 251—9 **16 Claims**



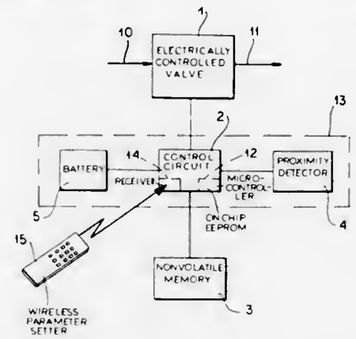
1. An improved flow control pinch mechanism comprising in combination:
(a) a first fluid-conducting tubular member having an internal fluid conducting channel, said member having a resilient region capable of resilient deformation to controllably occlude said fluid conducting channel to control fluid flow therethrough;
(b) a trumpet-type fluid control actuator having a spring-loaded piston;
(c) a cam assembly for imparting fluid control force to said resilient region of said fluid conducting channel, said cam assembly comprising:
(i) a cam having a principal camming surface,
(ii) a cam follower engaging said cam and having a non-rectilinear principal axis with first and second ends lying at ends of said non-rectilinear principal axis, said cam follower having at said first end a pivot support for positioning said first end; and
means including said trumpet-type fluid control actuator effective when said trumpet-type fluid control actuator is depressed for correspondingly causing relative movement between said cam and said cam follower to correspondingly cause said cam follower to pivot about said pivot support and correspondingly reduce said fluid control force.

5,588,635
LIQUID FLOW VELOCITY DIFFUSER
Thomas A. Hartman, 700 Capac Ct., St. Louis, Mo. 63125
Filed Aug. 26, 1994, Ser. No. 296,949
Int. Cl.[6] F16K *47/14*; **F15D** *1/06*
U.S. Cl. 251—127 **19 Claims**



1. An apparatus for diffusing velocity of liquid flowing in a conduit, the apparatus comprising:
at least one wall positioned inside the conduit for directing the liquid flowing through the conduit radially outwardly toward an inner peripheral surface of the conduit creating an annular layer of liquid flow adjacent to the inner peripheral surface of the conduit;
said at least one wall having a peripheral end and an opposite interior end, the peripheral end of the wall being secured to the conduit with the wall positioned inside the conduit projecting toward a center axis of the conduit as the wall extends from its peripheral end toward its interior end.

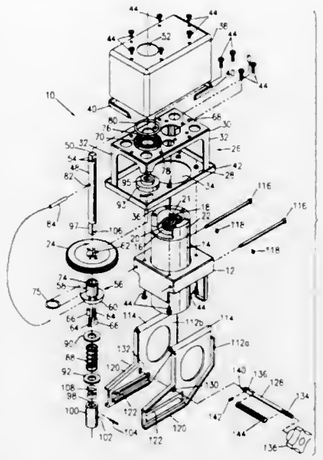
5,588,636
WATER FIXTURE CONTROL SYSTEM
Heinz-Dieter Eichholz, Iserlohn, and Hans-Peter Rudrich, Windischeschenbach, both of Germany, assignors to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Jun. 8, 1995, Ser. No. 488,629
Claims priority, application Germany, Jun. 10, 1994, 44 20 334.9
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.04 **14 Claims**



1. A water-control device comprising:
an electrically controllable valve for dispensing water in a sanitary fixture;
a control circuit operatively connected to said valve and provided with a proximity detector for operating said valve in response to proximity of a user of said fixture and with system parameters and operating parameters including flow duration and operating range of said proximity detector;
a voltage source connected to said control circuit;
means in wireless communication with said control circuit for contactless setting of at least one of said system and operating parameters in said control circuit; and
at least one nonvolatile memory connected to said control circuit for storing said system and operating parameters independently of failure of said voltage source whereby operation of said control circuit with said system and operating parameters is automatically restored by said nonvolatile memory upon restoration of said voltage source to said control circuit.

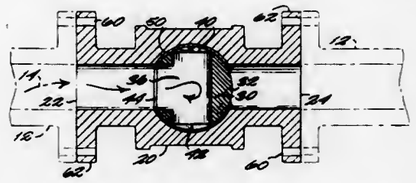
5,588,637
AUXILIARY AUTOMATIC VALVE SHUT-OFF SYSTEM
Robert L. Carsten, 1098 Redding, Costa Mesa, Calif. 92626, and Bernard E. Wilberger, Orange, Calif., assignors to Robert L. Carsten, Costa Mesa, Calif.
Filed May 30, 1995, Ser. No. 453,643
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.03 **42 Claims**

1. A system for automatically actuating a valve in response to an actuation signal, comprising:
a first device that generates an actuation signal;
a second device that generates a switching signal having a first value in response to the actuation signal;
an electric motor operatively coupled to the valve;
an electrical power supply;
a switching mechanism that closes to connect the motor to the power supply in response to the first value of the switching signal; and
a third device that generates a control signal having a value that is proportional to the measured value of the current drawn by the motor from the power supply through the switching mechanism when the switching mechanism is closed;
wherein the second device receives the control signal and generates a switching signal having a second value in response to



a value of the control signal that is indicative of a measured current value that is greater than a predetermined current value, and wherein the switching mechanism opens to disconnect the motor from the power supply in response to the second value of the switching signal.

5,588,638
BALL VALVE
Bryce T. Bunting, 1900 Country Club Rd., Statesboro, Ga. 30458, and Lalan W. Cook, 5957 St. Lukes Church Rd., Prosperity, S.C. 29127
Filed Sep. 5, 1995, Ser. No. 523,690
Int. Cl.[6] F16K *5/06*
U.S. Cl. 251—315.05 **3 Claims**



1. A ball valve for controlling fluid flow, said ball valve having an open position that allows the fluid to flow through said ball valve and a closed position that prevents fluid from flowing through said ball valve, said ball valve comprising:
a housing having an inside surface, and an upstream channel and a downstream channel, said upstream channel having a size and shape;
a ball element dimensioned to fit inside said housing so that said ball element can rotate within said housing, said ball element having
an exterior surface,
a first port,
a second port forming a fluid conduit through said ball element with said first port, and
a third port intersecting said fluid conduit,
said ball valve being in the open position when said first and said second ports of said ball element are aligned with said upstream and downstream channels and being in the closed position when said third port is aligned with said upstream channel and said first and second ports are not aligned with said upstream and downstream channels.

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said third port being dimensioned to be no smaller than the upstream channel so that, when said ball valve is in said closed position, said ball element provides no portion of its exterior surface on which scale from said fluid can build up to affect the rotation of said ball element, wherein said exterior surface of said ball element is impregnated with a fluoropolymer; and

a fluoropolymer jacket carried by said inside surface of said housing to match said exterior surface of said ball element to facilitate rotation of said ball element within said housing.

5,588,639

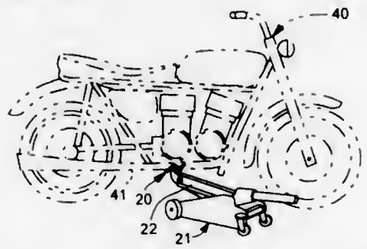
ONE MAN LIFT FOR MOTORCYCLES

John A. Holman, 10424 S. Church St., Chicago, Ill. 60643

Filed Apr. 6, 1995, Ser. No. 417,819

Int. Cl.[6] B66F *3/00*

U.S. Cl. 254—133 R **8 Claims**



1. A support structure for lifting a motorcycle in combination with a jack, said support structure comprising a cylindrical cradle adapted to fit over an elevatable portion of the jack and having a tubular member extending across said cylindrical cradle positioned above the bottom of said cylindrical cradle to provide a rocking or tilting motion of said cradle with respect to the elevatable portion, said cylindrical cradle has a pair of longitudinally extending tubular support members connected to the top of said cylindrical cradle at the periphery thereof, said cylindrical cradle having a shiftable fit with respect to said elevatable portion of the jack to permit tilting of said support members supporting the motorcycle providing access to either the front or rear wheel of the motorcycle.

5,588,640

AIR-SPRING LEG WITH A PRESSURE CHAMBER FOR MOTOR VEHICLES

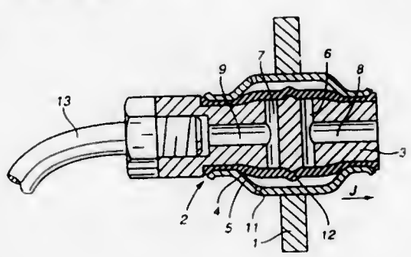
Matthias Römer, Weinstadt, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

Filed Oct. 17, 1995, Ser. No. 544,005

Claims priority, application Germany, Oct. 26, 1994, 44 38 192.1

Int. Cl.[6] F16F *9/02*; **F16K** *17/04*; **B60G** *11/27*; *17/04*

U.S. Cl. 267—64.11 **13 Claims**



1. Air-spring leg of a spring bellows-type with a pressure chamber, having an interior and an exterior, for motor vehicles, in which the pressure chamber can be subjected to different pressures via a connector, arranged in a wall of the pressure chamber, leading to the exterior, wherein an automatically operating pressure relief valve is provided in the connector for maintaining a minimum pressure which can be predetermined for the pressure chamber;

wherein said pressure relief valve opens at a pressure which is acting from the interior of the pressure chamber or from the exterior and is above the minimum pressure and closes at a pressure below the minimum pressure; and

wherein the flow path leading through the connector passes through a connection space which is located within the pressure relief valve, and wherein an elastomer is movably arranged in the pressure relief valve dependent on the pressure in the connection space, to prevent a throughflow of the connection space at a pressure prevailing there below the minimum pressure and to permit such throughflow at a pressure above the minimum pressure, the elastomer being prestressed to achieve flow prevention.

5,588,641

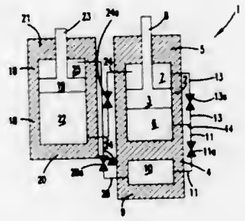
GAS SPRING WHICH AFTER COMPRESSION HAS A TIME DELAYED RETURN TO ITS ORIGINAL LENGTH

Gunnar Sand, Huskvarna, Sweden, assignor to Stromsholmens Mekaniska Verkstad AB, Sweden

Continuation-in-part of Ser. No. 119,206, Nov. 26, 1993, Pat. No. 5,435,530. This application Jun. 6, 1995, Ser. No. 471,978

Int. Cl.[6] F16F *5/00*

U.S. Cl. 267—119 **5 Claims**



1. An apparatus for a gas spring, comprising:

a first cylinder closed at both ends by first and second end walls;

a first piston capable of axial displacement being disposed inside a fluid-filled inner space of the first cylinder, the first piston dividing the cylinder into first and second sub-spaces, the first sub-space is bounded by the first end wall, the first piston, and a first interjacent part of two side walls of the first cylinder, the second sub-space is bounded by the second end wall, the first piston, and a second interjacent part of the two side walls of the first cylinder;

a first piston rod, connected to the piston, being mounted in a sliding and sealing fashion in the second end wall;

a second cylinder closed at both ends by third and fourth end walls;

a second piston being disposed inside a fluid-filled inner space of the second cylinder capable of axial displacement therein, the second piston dividing the second cylinder into first and second cylindrical chambers, the first cylindrical chamber is bounded by the third end wall, the second piston, and a third interjacent part of two side walls of the second cylinder, the second cylindrical chamber is bounded by the fourth end wall, the second piston, and a fourth interjacent part of the two side walls of the second cylinder;

a second piston rod, connected to the second piston, being mounted in a sliding and sealing fashion in the fourth end wall;

the first and second piston rods being forced downwards by a force to increase pressure inside the first cylindrical chamber and the first sub-space and to decrease pressure inside the second cylindrical chamber and the second sub-space;

valve means for selectively communicating among the first and second sub-spaces and first and second cylindrical chambers to decrease pressure inside the first sub-space so as to cause the first piston to be locked for a predetermined period of time, and for causing the first and second pistons to move upwards and back to an initial position of each of the first and second pistons after a predetermined delay;

wherein the valve means includes a plurality of openable and closable valves which are controlled by a control device; and

wherein the plurality of the valves include first, second, and third valves, the first sub-space communicates with the second sub-space via the first valve, the second sub-space communicates with the first cylindrical chamber via the second valve, and the first sub-space communicates with an enclosed space, which is bounded by the first end wall, a fifth end wall, and extension walls of the two side walls of the first cylinder, via the third valve.

5,588,642

CLAMPING APPARATUS

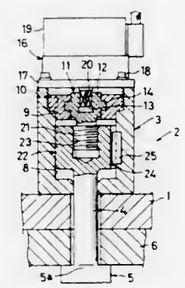
Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha Kosmek, Japan

Continuation of Ser. No. 331,101, Oct. 28, 1994, abandoned. This application May 15, 1996, Ser. No. 648,291

Claims priority, application Japan, Nov. 5, 1993, 5-275844

Int. Cl.[6] B25B *1/00*

U.S. Cl. 209—244 **20 Claims**



1. A clamping apparatus comprising:

a housing;

a first threaded member having a first, longitudinally extending axis;

means for supporting said first threaded member within said housing for rotation about said first axis while restricting longitudinal movement of said first threaded member relative to said housing;

a second threaded member having a second, longitudinally extending axis, an outer periphery and an associated longitudinal length, said second threaded member being threadably engaged with said first threaded member for movement through a longitudinal clamping stroke with the outer periphery and the entire said associated longitudinal length of said second threaded member being substantially entirely surrounded and guidably supported throughout said longitudinal clamping stroke by said housing for relative longitudinal movement;

means, interconnected between said second threaded member and said housing, for permitting said second threaded member to move longitudinally along said second axis while restricting rotational movement of said second threaded member about said second axis;

an impact wrench mounted to said housing and connected to said first threaded member for rotating said first threaded member about said first axis; and

a clamping member movable between a clamping position and an unclamping position, said clamping member having an input portion connected to said second threaded member.

5,588,643

METHOD AND DEVICE FOR WITHDRAWING FLAT FOLDED CARTON BLANKS FROM A MAGAZINE AND FOR FEEDING THEM TO A CARTON SET UP LINE

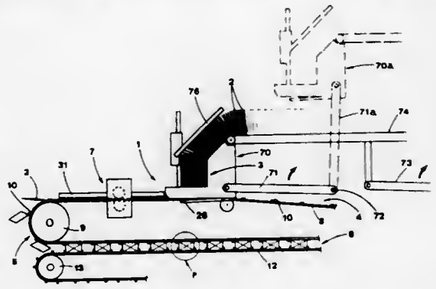
Roberto Tagliaferri, Castel S. Pietro, and Rodolfo Caroli, Imola, both of Italy, assignors to I.M.A. Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Feb. 6, 1995, Ser. No. 383,634

Claims priority, application Italy, Feb. 8, 1994, BO94A0049

Int. Cl.[6] B65H *3/04*

U.S. Cl. 271—35 **14 Claims**



1. A device for withdrawing flat folded cannon blanks from a magazine where said carton blanks are stored in a flat folded condition to form a stack, and for feeding said cannon blanks to a feeding line, said device comprising:

supporting bars located under said magazine for supporting said stack of flat folded tubular cannon blanks;

stop means located downstream of said magazine and over said supporting bars, said stop means cooperating with said supporting bars to delimit an opening having a height equal to a thickness of a folded carton blank; and

belt conveyor means situated under said magazine and featuring a plurality of lugs regularly spaced apart and protruding upwardly beyond said supporting bars, said lugs engaging a rear edge of a lowermost carton blank of said stack for stripping said lowermost blank and conducting said lowermost blank through said opening delimited by said supporting bars and said stop means situated thereabove;

said magazine including front vertical guides and rear vertical guides, with reference to advancement movements of said belt conveyor means, with at least said front vertical guides supported by a carriage that is slidably supported by a frame forming part of said magazine, and that is moved by rack means, so that said front vertical guides can be moved to adjust longitudinal dimensions of said magazine.

5,588,644

INTERLEAVING APPARATUS FOR ROLLED UP SEGMENTS

Ronald L. Lotto, Bonduel; Ernest H. Teske, Green Bay, and Peter Hatchell, New Franken, all of Wis., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 409,484, Mar. 21, 1995, which is a continuation of Ser. No. 889,230, May 27, 1992, abandoned, which is a continuation of Ser. No. 651,676, Feb. 6, 1991, Pat. No. 5,161,793. This application Dec. 4, 1995, Ser. No. 566,796

Int. Cl.[6] B65H *29/68*

U.S. Cl. 271—183 **2 Claims**

1. A method for overlapping individual plastic webs of material comprising the steps of:

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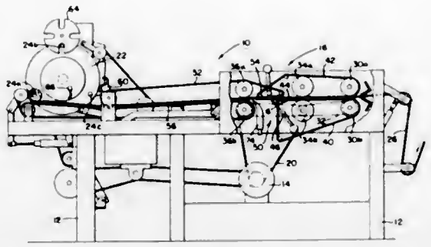


feeding a continuous sheet of plastic film having perforations thereon in between a pair of feed rolls driven at a first speed, said perforations defining individual plastic webs to be formed;

separating a leading individual plastic web and a trailing individual plastic web at a perforation between said webs;

interleaving said individual leading and trailing plastic webs;

providing said interleaved webs to a pair of driving rolls driven at a speed slower than said first speed, and

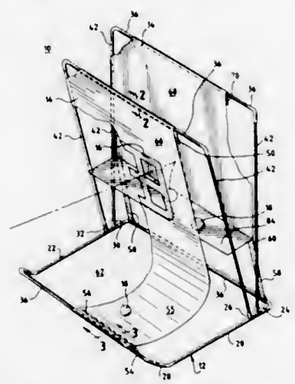
providing said interleaved webs to a winder, said winder being downstream from said driving rolls.

5,588,645

BASEBALL PITCHING APPARATUS

Fred W. Schwan, Cary, and William C. Francis, McHenry, both of Ill., assignors to Commercial Concepts, Inc., Cary, Ill.

Filed Jul. 24, 1995, Ser. No. 506,089
Int. Cl.[6] A63B *69/40*
U.S. Cl. 473—456 **6 Claims**



1. A baseball pitching apparatus comprising:

a frame defining at least three, different generally rectangular planes, a first plane formed by a pair of mirror image tubular base members that are parallel, horizontal and spaced a predetermined distance apart from one another and each having a front and rear end, each base member having two upwardly extensions that taper at their ends, one extension is angled approximately 90° from the horizontal length of the base member and the other extension is angled toward the front end of the base at an angle less than a 90° angle, a first pair of U-shaped cross bar members having tapered leg ends inserted into the front and rear ends of the base members, a second plane formed by a first pair of upright member having lower and upper ends, said lower ends inserted over the tapered ends of the angled extension and having a U-shaped cross bar member having tapered leg ends inserted into the upper ends of said pair of upright members, a third plane formed by a second pair of uprights having lower and upper ends, said lower ends inserted over the tapered ends of the vertical extensions and having a U-shaped cross bar member having tapered legs ends inserted into the upper ends of said second pair of upright members; and

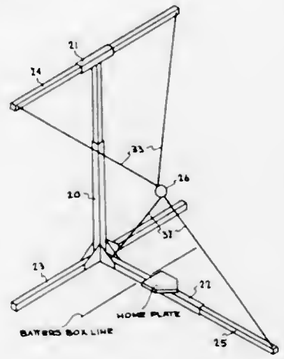
a tarp of a generally rectangular shape having means for attaching it to the front cross bar member, the angled upright cross bar member and the vertical upright cross bar member so that the tarp drapes between the front and angled cross bar members to form a channel for catching errant pitches and drapes between the angled and vertical cross bar members having means attached to the tarp hanging down from the vertical upright cross bar to form a baffle between the drape over the angled and vertical cross bars, said tarp having a target opening through the drape over the angled upright cross bar so that a baseball maybe thrown through the target opening to be stopped by the rear drape over the vertical cross bar and then drop to the baffle therebetween for later retrieval.

5,588,646

TETHERED BALL BATTING PRACTICE DEVICE

John W. Dickson, 16131 Fifth St., Lathrop, Calif. 95330

Filed Aug. 1, 1995, Ser. No. 521,391
Int. Cl.[6] A63B *69/40*
U.S. Cl. 473—426 **17 Claims**



1. A batting practice device consisting of:

a horizontal frame base having an intersection formed by a leg member and arm members interconnected in the shape of a "T",

a vertical member affixed to the intersection of said horizontal "T",

a horizontal member centered and affixed to the top of said vertical member to form arms of a vertical "T" that parallel arms of said horizontal "T",

a flexible means forming a ball suspension system containing a target ball with first and second ends secured to ends of the arms of said vertical "T", a third end secured to an end of the leg member of said horizontal "T" to form a "Y" shape configuration angled at a degree relative to the ground, a fourth end secured to the intersection of said horizontal and vertical "T"'s to stop return velocity of the ball target after being hit, and

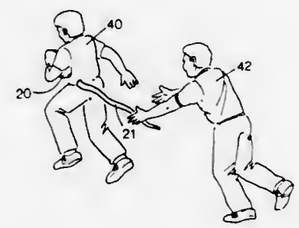
said flexible means of said ball suspension system intersects with and is secured to said ball target to facilitate suspension of said ball target therein.

5,588,647

METHOD OF PLAYING A FOOTBALL GAME

Elliot Rudell, 1619 Gramercy Ave., Torrance, Calif. 90501, and George Foster, Signal Hill, Calif., assignors to Elliot Rudell, Torrance, Calif.

Division of Ser. No. 82,491, Jun. 28, 1993, Pat. No. 5,467,981, which is a continuation-in-part of Ser. No. 873,727, Apr. 27, 1992, Pat. No. 5,228,690. This application Aug. 24, 1995, Ser. No. 519,140
Int. Cl.[6] A63B *67/00*
U.S. Cl. 473—470 **3 Claims**



1. A method for playing a football game, between a plurality of first players and a plurality of second players comprising the steps of:

a) initiating a play wherein one of the first players holds a football that has a detachable tail;

b) running toward a goal by the first player with said football;

c) pursuing the first player with said football by at least one second player;

d) detaching said tail from said football by a second player, wherein said detachment of said tail is indicative of a tackle and termination of the play; and,

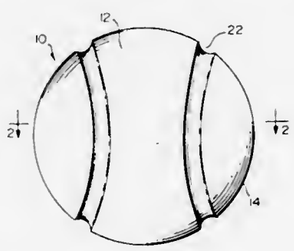
e) repeating steps (a)–(d) until a first player with said football crosses the goal and scores.

5,588,648

TRAINING BALL FOR BASEBALL AND SOFTBALL BATTING PRACTICE

Scott Stebbins, 8606 31st St. W., Tacoma, Wash. 98466

Filed May 22, 1995, Ser. No. 445,795
Int. Cl.[6] A63B *37/06*
U.S. Cl. 473—451 **18 Claims**



1. A weighted training ball for baseball batting training, comprising:

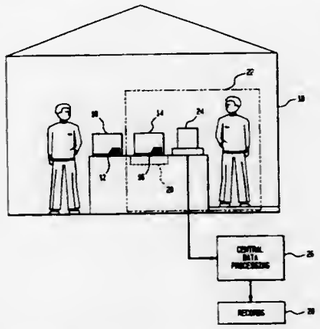
a substantially spherical, solid body of molded elastomeric material, wherein the body has a circumference of approximately 9 inches, a weight of between approximately 7.5–10 ounces, an average density of the elastomeric material forming the body of between approximately 0.0214–0.05885 pounds per cubic inch, and a type A-2 Shore durometer at a surface of the body of between approximately 40–70.

5,588,649

MULTI TOKEN GAMING METHOD

Barry B. Blumberg, Yardley, Pa.; James M. Pecka, Mt. Laurel, N.J., and Bruce S. Allen, Feasterville, Pa., assignors to CompuScan Technologies, Inc., Delran, N.J.

Continuation of Ser. No. 238,237, May 4, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,318
Int. Cl.[6] A63F *9/24*
U.S. Cl. 463—18 **43 Claims**



1. A promotional gaming method for enticing a patron to purchase at least two products that are being promoted by an establishment using an electronic promotional system, the products including a good or a service, the method comprising the steps of:

distributing a plurality of tokens to a patron of the establishment, each of said plurality of tokens being associated with a product and including a machine readable code;

presenting by the patron at least two of said plurality of tokens at a code reading location in the electronic promotional system;

reading said machine readable codes on said at least two tokens presented by said patron at said code reading location by said electronic promotional system to thereby provide a group of inputs;

determining by said electronic promotional system if said group of inputs for each patron includes a set of inputs matching a preselected set of actuating codes, said preselected set of actuating codes corresponding to one or more products which are being promoted by the establishment; and

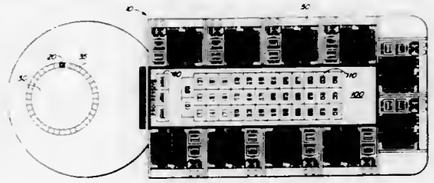
actuating a random selection process if said set of inputs matches said predetermined set of actuating codes so as to randomly award prizes only to patrons who have presented tokens with machine readable codes that match said predetermined set of actuating codes, whereby a patron who purchases at least two products which are being promoted is rewarded with am opportunity to win a prize.

5,588,650

AUTOMATED INTERACTIVE ROULETTE WITH PROGRESSIVE JACKPOT

Richard G. Eman, Wilhelminastraat 24, and Luis E. Mansur, Bachstraat 5, both of Oranjestad, Aruba

Filed Jul. 19, 1995, Ser. No. 504,236
Int. Cl.[6] A63F *5/00*
U.S. Cl. 273—142 B **15 Claims**



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1. An automated roulette device having an annular ball track and a centrally disposed rotatable wheel with a plurality of ball receptor zones about a periphery thereof, and a ball adapted for travel about the ball track and subsequent receipt, by chance, within any of said ball receptor zones to determine a winning outcome of each spin of the roulette wheel, said device comprising:

wheel control means for controlling actuation and a speed of rotation of the roulette wheel, said wheel control means being structured to allow the roulette wheel to slow after actuating rotation thereof, until said roulette wheel comes to a rest,

a ball launching mechanism for launching the ball into the ball track after actuation of rotation of said roulette wheel,

detection means for continuously monitoring and visually indicating the location of the ball relative to each of the ball receptor zones as the ball travels about the ball track until coming to rest within one of the ball receptor zones,

a processor interconnected to the roulette wheel, said wheel control means, said ball launching mechanism and said detection means for operating said wheel control means and receiving input from said detection means and determining the winning outcome of each spin of the roulette wheel,

play display means interconnected with said processor for visually indicating the winning outcome of each spin of the roulette wheel,

at least one player console interconnected to said processor for entering wagers on the winning outcome of each spin of the roulette wheel and comprising:

cash input means for reception of money therein, and translation thereof by said processor into units of wagering credit,

credit display means for displaying current wagering credit available for entering wagers,

bet input means for inputting said wagers to be received by said processor,

bet display means for displaying said input wagers,

ball launch control means for allowing player control of time of release of the ball by said ball launching mechanism into said annular ball track and for further allowing player control of the velocity of the ball at its release by said ball launching mechanism,

cash-out means for terminating player participation and printing credit receipts to indicate a remaining amount of said current wagering credit available at the time of termination of play, and

said processor being structured to compare said input wagers with said winning outcome to determine an amount of wagering credit units to add or subtract from said current wagering credit available.

5,588,651

HAND ACCESSORY FOR SWINGING AN IMPLEMENT HANDLE

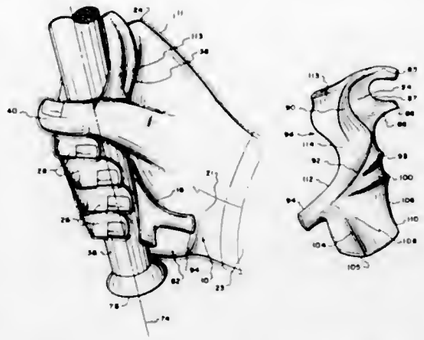
John H. Frost, 6900 Canby Ave.-#110, Reseda, Calif. 91335

Continuation-in-part of Ser. No. 262,242, Jun. 20, 1994, abandoned. This application Oct. 5, 1995, Ser. No. 539,215

Int. Cl.[6] A63B *57/00*

U.S. Cl. 473—206 **30 Claims**

1. In combination with the handle of an implement when said handle is to be manually swung in motion by the hand of a human with the hand gripping and squeezing said handle, the hand having a concave palm from which extend a thumb and fingers, the fingers named from the inside of the hand nearest the thumb being the index finger, the middle finger, the ring finger and the little finger, the hand having a plurality of tough fleshy areas, the hand having a plurality of sensitive areas, the hand having a web located between the base of the thumb and the index finger, the concave palm including a lifeline crease which in part contours the thumb base, the concave palm bordered by a transverse crease located directly adjacent and below the knuckles of the fingers, the concave palm bordered on the outside by a tough ball directly adjacent and below the little finger and bordered by a sensitive heel located below the tough ball directly adjacent the concave palm and a tougher heel located below the sensitive heel, the concave palm



having several separate sensitive areas and several separate trough areas, the hand pivoting at the transverse crease during the squeezing of said handle such that the tough ball, heel and thumb base move in a direction toward said handle during the squeezing, a hand accessory to be positioned between said handle and the hand, said hand accessory comprising:

a plug having primarily a slightly arcuate front surface to engage with said handle, said plug having a back surface which is to press against the hand, said back surface of said plug having a plurality of curved surfaces and concave areas to engage the sensitive areas and to allow movement of said pivoting;

ridges and protrusions to engage the tough, fleshy areas serving to maintain position of said plug within the hand and resisting the inertial movement of said handle toward the web, a glove worn over the hand presses certain areas of said plug against the hand, said plug being bendable to permit deflection of said front surface during said pivoting of the hand so that said front surface closely conforms to said handle during the squeezing, whereby said plug facilitates the transmission of a manual swinging force between the hand and said handle; and

said plug includes a locking recess, a portion of the index finger to fit within said locking recess, whereby said locking recess functions to locate the position of said plug within the hand such that force is transmitted through the fingers of the hand.

5,588,652

GOLF RANGE GAME

John Lang, P.O. Box 3426, Scenic Caves Road, R.R. #3, Collingwood, Ontario, Canada

Filed Sep. 18, 1995, Ser. No. 529,770

Int. Cl.[6] A63B *67/02;69/36*

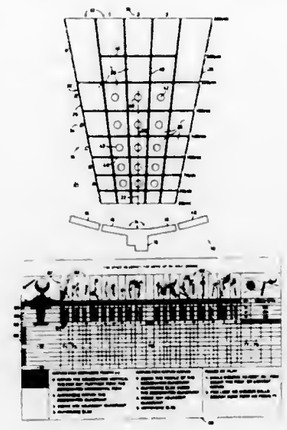
U.S. Cl. 473—168 **19 Claims**

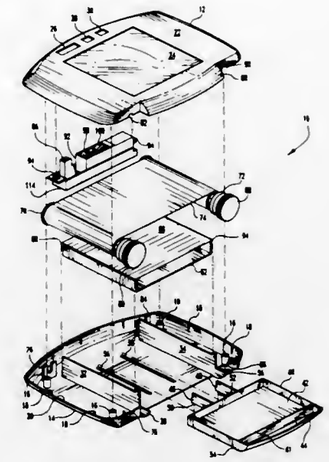
1. A facility for playing a game with a golf club and golf balls, the facility comprising:

a site having a range area visibly divided into a plurality of contiguous target regions, each said target region being associated with a target identifier, and a tee area having a plurality of contiguous tees from which golf balls may be hit toward said range area;

scoring means located at said site for scoring a game, said scoring means setting out a sequence of said target identifiers so as to establish a corresponding sequence of designated target regions to which golf balls are to be hit from the tee with a golf club in order, and said scoring means providing means for recording a point score for each time a player hits a golf ball; and

a scoring system associated with said scoring means for awarding a point score according to the observed resting position of the golf ball relative to the designated target region.





5,588,653

GOLF SWING PRACTICE DEVICE

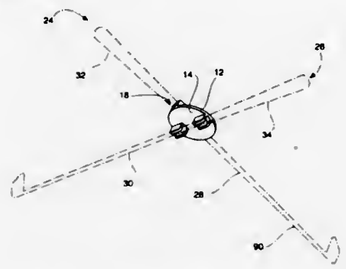
Gary G. Robinson, R. R. #4, Komoka, Ontario, Canada

Filed Oct. 17, 1995, Ser. No. 543,893

Claims priority, application Canada, Oct. 6, 1995, 2160059

Int. Cl.[6] A63B *69/36*

U.S. Cl. 473—218 **22 Claims**



1. A device for use in combination with golf clubs to assist golfers in practicing appropriate aspects of a golf swing, said device comprising:

a plate having two opposed faces;

first connector means for detachable connection with a shaft of a first golf club on one face of said plate; and

second connector means for detachable connection with a shaft of a second golf club on the opposed face of said plate, said first connector means and said second connector means each having respective axes, the axis of said second connector means being oriented so that it is at a predetermined angle to the axis of said first connector means.

5,588,654

GAME PLAYING APPARATUS

Carl E. Voigt, IV, Indianapolis, Ind., and Cheung K. Chow, Shatin, Hong Kong, assignors to Third Quarter Corporation, Indianapolis, Ind.

Filed Feb. 9, 1995, Ser. No. 386,291

Int. Cl.[6] A63F *3/00*

U.S. Cl. 273—284 **7 Claims**

1. A game playing apparatus, comprising:

a housing having an opening therein;

first and second spindles rotatably engaged with the housing and positioned on opposite sides of the opening;

an elongate sheet having first and second ends, the first end being attached to the first spindle and the second end being attached to the second spindle, wherein the elongate sheet has a plurality of game playing surfaces marked thereon, such that rotation of one of the first and second spindles is operative to align a selected one of the game playing surfaces with the opening; and

a die-throwing device coupled to the housing and including a die, the die-throwing device including an actuator operable to cause the die to randomly display a die face in response to activation of the actuator.

5,588,655

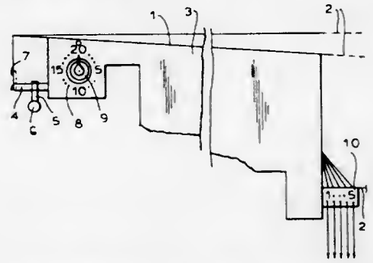
VOLLEYBALL TRAINING DEVICE

Leontiy Slupskiy, 240 Mt. Vernon Pl., #4D, Newark, N.J. 07106

Filed Nov. 6, 1995, Ser. No. 554,354

Int. Cl.[6] A63B *69/00*

U.S. Cl. 473—429 **4 Claims**



1. A volleyball training device, comprising a bracket; a turnable support mounted on said bracket turnably about its axis; at least one ball; a ball holder which holds said ball and is connected with said turnable support so as to turn together with the latter, said ball holder being formed as a substantially curved element extending in a plane substantially perpendicular to said axis, so that when an attacking strike is delivered by a player against said ball, said ball together with said ball holder and said support is turned about said axis in said plane; and means for counting a number of strikes against the ball, said counting means being connected with said turnable support.

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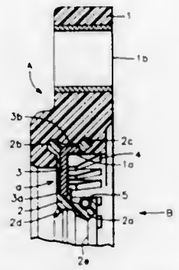
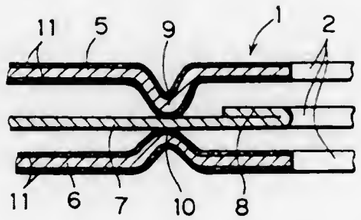
5,588,656
CRANKSHAFT SEAL HAVING RESILIENT PORTION EMBEDDED IN RIGID RETAINER
Noboru Matsushima, Fukushima, Japan, assignor to NOK Corporation, Tokyo, Japan
Filed Feb. 3, 1995, Ser. No. 383,489
Claims priority, application Japan, Feb. 7, 1994, 6-035319
Int. Cl.[6] F16J *15/32*
U.S. Cl. 277—35 **5 Claims**



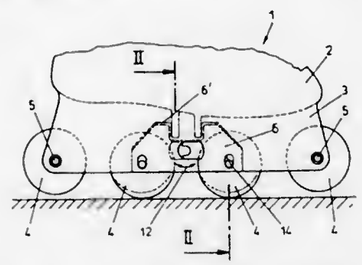
1. A sealing structure comprising a retainer, a lip means for providing a sealing effect and a rigid ring fixed to the retainer and having an inner periphery and an outer periphery, the lip means being fixed to the ring, the lip means including an inner lip means which is annular and placed at the inner periphery of the ring and an outer lip means which is annular and placed at the outer periphery of the ring, the outer lip means having a resilient or elastic portion embedded in the retainer in such a manner that the retainer can support the ring and the inner lip means in a floating condition, wherein the elastic or resilient portion of the inner lip means includes a first outer lip projecting in an oblique direction from an intermediate portion of the ring and a second outer lip projecting in an oblique direction from an outer edge portion of the ring.

5,588,657
LAMINATED METAL GASKET WITH DIVERSE BEAD HEIGHT
Katsuhide Fujisawa; Eiichi Tahara, and Tetsuya Hida, all of Yamato, Japan, assignors to Nippon Reinz Co., Ltd., Kanagawa, Japan
Filed Oct. 3, 1995, Ser. No. 538,399
Int. Cl.[6] F16J *15/08*
U.S. Cl. 277—180 **13 Claims**



1. A laminated metal gasket disposed between a pair of joint surfaces having at least one hole to be sealed comprising:
at least one intermediate plate made of a metal plate, and
a pair of surface plates made of elastic metal plates laminated on both sides of said intermediate plate,
said intermediate plate and said surface plates each having at least one hole portion corresponding to said hole to be sealed,
said intermediate plate being equipped, adjacent to said hole portion, with an annular folded portion which is made by folding back the inner peripheral edge portion thereof to said surface plate coming into contact with the joint surface to be subjected to more significant distortion and deformation during operation among the pair of joint surfaces, and
said surface plates each being equipped with a bead surrounding said hole portion outside said folded portion,
wherein said bead of said surface plate coming into contact with the joint surface to be subjected to more significant distortion and deformation is made higher than the bead of said surface plate coming into contact with the other joint surface.

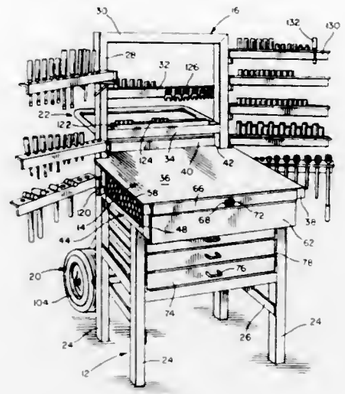
5,588,658
APPARATUS FOR MOUNTING SKATE ROLLERS IN INLINE ROLLER SKATES
Johann Perner, Graz, and Gerhard Trinkaus, Voitsberg, both of Austria, assignors to Koflach Sport Gesellschaft m.b.H. & Co. KG, Austria
PCT No. PCT/AT94/00062, § 371 Date Jan. 10, 1995, § 102(e) Date Jan. 10, 1995, PCT Pub. No. WO94/26367, PCT Pub. Date Nov. 24, 1994
PCT Filed May 9, 1994, Ser. No. 367,144
Claims priority, application Austria, May 12, 1993, 935/93
Int. Cl.[6] A63C *17/06*
U.S. Cl. 280—11.22 **6 Claims**



1. A device for mounting rollers in inline roller skates, in which the roller axles extend through openings in a frame and are mounted in a sub-frame, in which the inner diameter of the openings in the frame is larger than the outer diameter of the roller axles, and the sub-frame can be secured to the frame in at least two different vertical positions,
characterized in that,
the sub-frame (6, 19) is positively lockable in at least two different vertical positions using an insert member (10) extending through the frame (3) and free flanks of the sub-frame (6, 19).

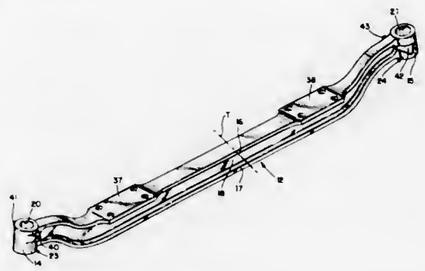
5,588,659
TOOL CART
James A. Boes; Chad W. Boes, and Douglas W. Boes, all of Sullivan, Ind., assignors to Triple B Trenching, Inc., Sullivan, Ind.
Filed Mar. 29, 1995, Ser. No. 412,569
Int. Cl.[6] B62B *1/00*
U.S. Cl. 280—47.19 **15 Claims**

1. A tool cart comprising an upright stand, a work bench mounted on the upper end of the stand, an upright frame extending upwardly from the stand at one edge of the work bench, storage means supported from said stand and accessible from an edge of the work bench opposite to said frame, first tool supporting means mounted on said stand adjacent the work bench and second tool supporting means mounted on said frame above the work bench, said second tool supporting means mounted on said frame including a plurality of elongated members, each of said elongated members having pivotal connection at one end thereof with said



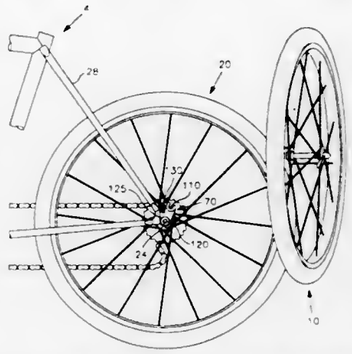
frame to enable the elongated members to swing to various angular positions in relation to the frame, work bench and stand, said stand including corner legs, a pair of wheels mounted on said legs on the side of the stand having the frame mounted thereon, a support for said wheels extending laterally from the stand and including brackets supporting the wheels, said wheels being mounted on the legs in spaced relation to a support surface when the stand is supported on said legs, a handle mounted on said frame above the work bench and extending laterally in the same direction as the wheel support to enable the stand, work bench and frame to be tilted by exerting lateral pressure on the handle to engage the wheels with the supporting surface and elevate the legs above the supporting surface to enable the cart to be rolled to a use site.

5,588,660
STEERING AXLE
Richard L. Paddison, Ortonville, Mich., assignnr to General Motors Corporation, Detroit, Mich.
Filed Sep. 28, 1995, Ser. No. 535,428
Int. Cl.[6] B62D *7/08*
U.S. Cl. 280—95.1 **4 Claims**



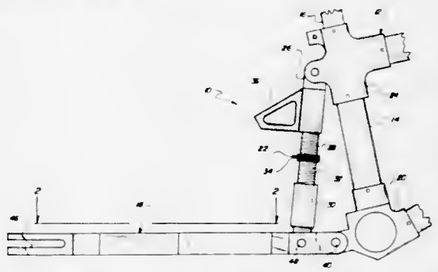
1. A steering axle comprising:
an axle beam having an elongated body and a longitudinal centerline with first and second ends, each end being capable of carrying a steering knuckle assembly that is pivotably rotatable, wherein each end of the axle beam includes a pair of stops formed integrally therewith, the two stops within each pair of stops being disposed on opposite sides of the longitudinal centerline and at first and second distances along the axle beam relative to the end wherein the axle beam is reversibly assembleable with the first and second ends interchangeable to alternatively provide two different ranges of maximum steering angles.

5,588,661
WHEEL MOUNTING BRACKET AND SPACER
Robert M. Wolfe, 24042 Sprig St., Mission Viejo, Calif. 92691
Filed Jan. 10, 1995, Ser. No. 370,899
Int. Cl.[6] B62J *11/00*
U.S. Cl. 280—202 **9 Claims**



1. A support bracket for mounting on a first axle assembly of a first wheel, the support bracket comprising a rigid body providing a peripheral edge defining the extent of a pair of opposing, spaced apart, side surfaces, each surface situated in opposing parallel planes defining a body thickness therebetween, and further providing an elongate mounting slot open to the peripheral edge and extending into the body therefrom, and a round mounting hole including a counterbore from one of the side surfaces, the slot and hole extending through the body between the side surfaces, each providing clearance therethrough, the slot sized and oriented such that with the mounting hole operably engaged with the first axle assembly, the mounting slot is positioned for receiving an axle of a second axle assembly of a second wheel, for supporting the second wheel lateral to the first wheel.

5,588,662
ADJUSTABLE BICYCLE REAR AXLE SUPPORT ASSEMBLY
Robert L. Fortier, 502 W. Blum St., Alvin, Tex. 77511
Filed Mar. 1, 1995, Ser. No. 396,572
Int. Cl.[6] B62K *19/24;25/02*
U.S. Cl. 280—288 **9 Claims**



1. An adjustable bicycle rear axle support assembly comprising:
a bicycle frame having a rear vertical member, with the rear vertical member including an upper portion, and a lower portion;
a rear axle support member pivotally mounted to the lower portion of the rear vertical member of the frame, the rear axle support member extending rearwardly of the bicycle frame and being adapted to rotatably mount a rear wheel relative to the bicycle frame, the rear axle support member comprises a

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support member plate pivotally mounted to the lower portion of the rear vertical member of the bicycle frame, a first lateral rear axle support arm projecting from the support member plate and adapted to be positioned about a first lateral area of a bicycle rear wheel;

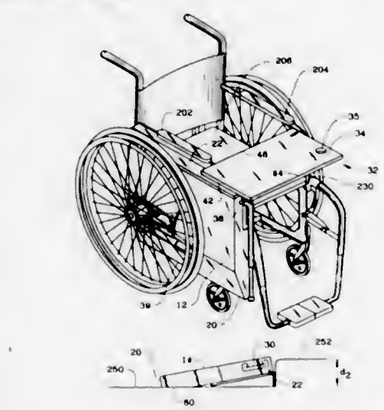
an adjustment means extending between the rear axle support member and an upper portion of the rear vertical member for adjustably positioning the rear axle support member into a fixed angular orientation relative to the rear vertical member, the adjustment means comprises a first receiver pivotally mounted to the upper portion of the rear vertical member, a second receiver pivotally mounted to the rear axle support member, and threaded projection means threadably engaged to the first and second receivers for adjustably positioning the first receiver in a spaced relationship relative to the second receiver, the second receiver of the adjustment means is pivotally mounted to the support member plate, the support member plate being shaped so as to define a mounting cavity extending into the support member plate within which a portion of the second receiver is positioned.

5,588,663

WHEELCHAIR TRAY ACCESSORY

Christopher Rundle, 12588 SW. 60th Ct., Miami, Fla. 33156, and Michael Borell, 7787 SW. 86th St. Apt. 310, Miami, Fla. 33143

Filed May 15, 1995, Ser. No. 440,756
Int. Cl.[6] A47B *83/02;* **A47C** *7/68*
U.S. Cl. 280—304.1 **10 Claims**



1. A wheelchair accessory for use in combination with a wheelchair having a frame construction with pivoting front wheels and enlarged rear wheels supporting a horizontal seat member and vertical back member, the wheelchair having spaced apart armrests positioned above an upper surface of the seat member leading to rear push handles disposed behind the vertical back member, said accessory comprising: a detachable housing means having an upper wall adjoined to a bottom wall by two side walls and a first and second end wall defining a chamber therebetween; guide means for securing said housing means to the wheelchair; first hinge means coupled to said second end wall for holding said second end wall in a closed position sealing said chamber, said first end wall having an angular shape, said second end wall rotatable to an over-center open position allowing access to said chamber; a pivotal tray means having a planar surface; a second hinge means coupled to said housing means for holding said tray means in a storage position juxtaposition to said upper wall allowing rotation to a generally horizontal position adjacent to the armrests;

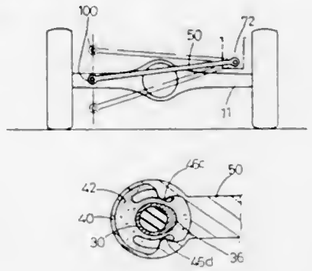
wherein said housing means is slidably secured to said wheelchair positioning a portion of said second end wall beneath a portion of one armrest preventing said second end wall from opening, said housing means slidable to a second position adjacent to the armrest allowing the rotation of said second end wall to said open position allowing access of items placed within the chamber of the housing means whereby the return of the housing means to the first position secures items within the chamber by preventing the opening of said second end wall, said housing means detachable from said wheelchair with the angular shape providing a ramp for rolling said wheelchair onto said housing means providing a ramp.

5,588,664

LINK DEVICE OF A LATERAL ROD FOR A VEHICLE

Tae J. Moon, Yangsan-kun, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea

Filed Dec. 29, 1995, Ser. No. 581,426
Int. Cl.[6] B60G *11/20*
U.S. Cl. 280—689 **3 Claims**



1. A link device of a lateral rod for a vehicle, comprising:

a bracket fixed to a rear axle of said vehicle;

an inner pipe attached to said bracket by a mounting bolt, said inner pipe having a raised portion extending from one side thereof;

an outer socket extending from one end of said lateral rod, said outer socket having a pair of upper and lower protruding portions wherein said upper and lower protruding portions extend from upper and lower portions thereof, and said outer socket surrounding said inner pipe for forming a ring-shaped space therebetween; and

a buffer member disposed within the ring shaped space between said inner pipe and said outer socket, whereby when the vehicle turns in any direction and rides over a bump, one of the protruding portions rotates into engagement with the raised portion of said inner pipe, thereby extending a vertical displacement of said lateral rod.

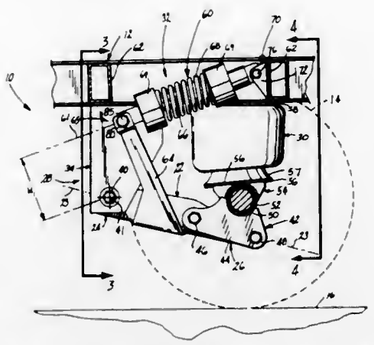
5,588,665

TRAILING ARM SUSPENSION WITH LEVER ARM

William C. Pierce, and Gregory A. Richardson, both of Muskegon, Mich., assignors to Nai Neway, Inc., Muskegon, Mich.

Filed Mar. 19, 1996, Ser. No. 618,318
Int. Cl.[6] B62D *61/12;* **B60G** *9/00;11/56*
U.S. Cl. 280—704 **25 Claims**

1. In a suspension for a vehicle comprising a frame, the suspension including a pair of trailing arms pivotally mounted to the frame for vertical swinging movement relative thereto about a transverse axis between at least a retracted position and a road engaging position, an axle mounted to and between the trailing arms for carrying wheels for contact with a road surface, and a selectably variable force spring between the trailing arms and the frame for cushioning the swinging movement of the trailing arms in the road engaging position, the improvement comprising:



a lever arm fixedly mounted to at least one trailing arm and extending upwardly therefrom, the lever arm being positioned to define a moment arm relative to the transverse axis that increases as the at least one trailing arm is moved toward the retracted position, and

a compression spring mounted between the frame and the lever arm above the transverse trailing arm axis to bias the at least one trailing arm to the retracted position,

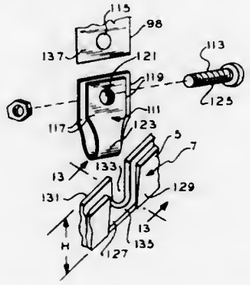
whereby the force of the compression spring exerted on the lever arm tends to raise the at least one trailing arm to the retracted position when the force on the variable force spring is reduced.

5,588,666

DRIVER SIDE AIR BAG COVER MOUNTING ASSEMBLY

Shigeo Numata, Patchogue, N.Y., assignor to Izumi Corporation, Yaphank, N.Y.

Filed Jun. 27, 1994, Ser. No. 266,250
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **4 Claims**



1. A mounting arrangement for a vehicle air bag comprising:

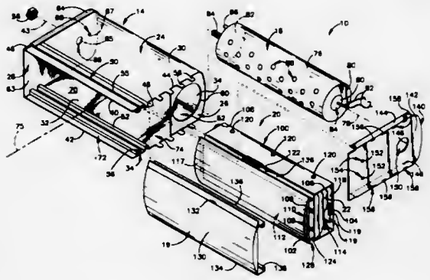
a boss means affixed to a component of a vehicle, spoke means extending from said boss means, a base plate having a first mounting portion on which an air bag is mounted and a second mounting portion on which said boss means is attached, a plurality of attachment clips, and a plurality of fasteners connecting said attachment clips to said second mounting portion of said base plate and said boss means, each of said attachment clips having generally straight, flexible leg sections and a central section connecting said leg sections together, each of said leg sections having an end portion, each of said end portions having an aperture therethrough for receiving a shank portion of one of said plurality of fasteners and for attaching together said second mounting portion and said boss means and wherein said boss means, said second mounting portion, and said attachment clips are formed of magnesium, aluminum and steel materials, respectively, said attachment clips spaced apart from said spoke means, boss mounting portion disposed generally perpendicular to said base plate, each boss mounting portion defining a channel and having slots formed in opposite sides thereof, each of said attachment clips frictionally engaging one of said slots formed in said boss mounting portion and one side of said second mounting portion for mounting said air bag, each said slot being tapered in opposite directions.

5,588,667

VEHICLE OCCUPANT RESTRAINT APPARATUS AND METHOD OF ASSEMBLY

Al S. Emambakhsh, Flat Rock; Michael P. Pionk, Marysville; Al A. Saberan, New Baltimore, and John P. Wallner, Rochester, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Sep. 30, 1994, Ser. No. 315,590
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **2 Claims**



1. Apparatus comprising:

a canister, said canister having wall means for defining a chamber, a side opening facing outward from said chamber in a first direction, and a deployment opening facing outward from said chamber in a second direction perpendicular to said first direction;

an inflator structure having means for directing inflation fluid into said chamber, said inflator structure being movable to an installed position in said chamber from said first direction through said side opening; and

a restraint assembly including an inflatable vehicle occupant restraint and support means for supporting said restraint in fluid communication with said inflator structure, said restraint assembly having an installed position engaged with said canister, said restraint being expandable from said deployment opening in said second direction upon inflation of said restraint when said restraint assembly is in said installed position;

said canister and said support means having cooperating means for guiding movement of said restraint assembly to said installed position in sliding contact with said canister in a third direction perpendicular to said second direction;

said wall means including a wall portion having a bendable tab formed as one piece with said wall portion;

said canister further including a closure wall having means for defining a slot, said closure wall being receivable in a closed position in which said closure wall blocks movement of said inflator structure and said restraint assembly from said installed positions, said tab being receivable through said slot and being bendable into a fastening position in which said tab retains said closure wall in said closed position;

said wall means including a side wall of said canister which has an annular inner edge surface defining said side opening in a circular shape, said closure wall extending across said side opening when said closure wall is in said closed position.

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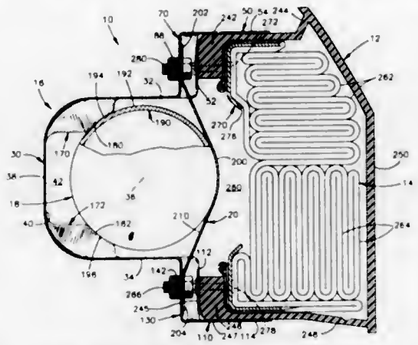
5,588,668

AIR BAG MODULE

Ali S. Emambakhsh, Rochester Hills, and Russell E. Stein, Leonard, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed May 26, 1995, Ser. No. 452,124
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **20 Claims**



11. A safety apparatus for protecting an occupant of a vehicle, said apparatus comprising:

an inflatable vehicle occupant restraint having a deflated condition and an inflated, occupant protecting condition;

an inflator for inflating said inflatable restraint, said inflator having a housing;

a canister defining a chamber for receiving said housing;

said canister having a main wall including upper and lower main wall portions and having first upper and lower main flanges projecting away from said upper and lower main wall portions, respectively, and away from each other;

each one of said first upper and lower flanges having a pair of first recessed portions;

said canister having a plurality of second recessed portions forming standoffs which project into said chamber and which define spaced surfaces for engaging spaced surface portions of said housing; and

securing means for clamping said surface portions of said inflator housing against said surfaces on said standoffs, said securing means being in engagement with said inflator housing and having portions located in said first recessed portions on said first upper and lower flanges.

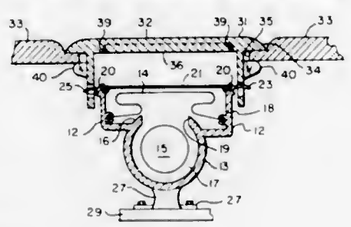
5,588,669

COVER ATTACHMENT FOR AN AIR BAG MODULE

Timothy J. Leonard, Stuttgart, Germany, and Kurt E. Kottke, Bountiful, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Apr. 26, 1995, Ser. No. 429,380
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.3 **18 Claims**

1. A cover attachment arrangement for an air bag module,



comprising:

a housing constructed and arranged to be secured to a structural element of a vehicle, said housing defining a chamber containing a cushion operatively connected to a gas generator, said housing including a plurality of mounting tabs extending therefrom;

a cover having a main panel with a periphery and a skirt having a rectangular periphery extending from said panel, said skirt sized to fit through an opening in a cabin element of the vehicle, said skirt including a plurality of slots, each said slot receiving an associated one of said mounting tabs, each said slot being larger than said associated tab to permit said cover to move with respect to said housing, and a plurality of placement tabs extending from said skirt, at least one of said placement tabs extending from each edge of said rectangular skirt, said placement tabs being spaced from said panel a distance to receive a peripheral edge of the opening in the cabin element of the vehicle.

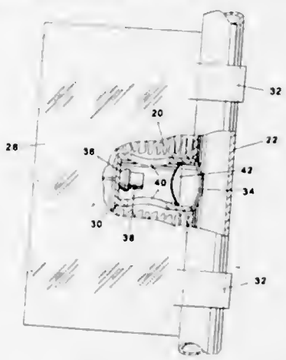
5,588,670

SEAT STRUCTURE PRESSURE VESSEL FOR AIRBAG INSTALLATION

J. Kirk Storey, Farmington, and Brent K. Olson, Clearfield, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jul. 20, 1995, Ser. No. 503,884
Int. Cl.[6] B60R *21/22*
U.S. Cl. 280—730.2 **7 Claims**

1. In a motor vehicle having passenger chairs therein including



at least one air bag module, an inflation initiator and a pressurized inflation-gas, the improvement comprising:

at least one of said chairs having a structural framework, said framework storing said pressurized inflation-gas, said at least one air bag module and said initiator mounted to and substantially externally on said framework.

5,588,671

RESEALABLE TEAR SEAM FOR SEAT DEPLOYED SIDE IMPACT AIR BAG

Mohamed Boumarafi, Rochester Hills; Jonathan P. Hurford, Lake Orion; William V. Collier, Milford, all of Mich., and Ralph Lichlyter, Danridge, Tenn., assignors to Takata, Inc., Auburn Hills, Mich.

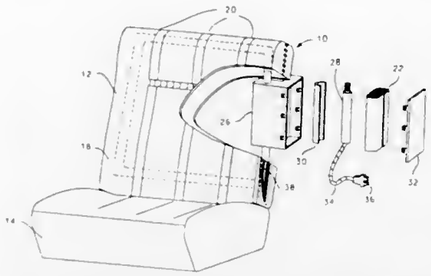
Filed Sep. 21, 1995, Ser. No. 531,517
Int. Cl.[6] B60R *21/22*
U.S. Cl. 280—730.2 **20 Claims**

1. A vehicle seat apparatus comprising:

an internal seat frame;

an external covering; and

a seat deployed air bag contained within said seat and covered by said covering wherein said air bag is deployed through a



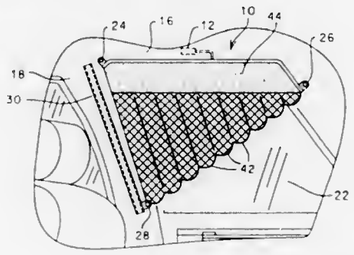
resealable seam in said covering, said seam having a first seam member having at least two arm members which together form at least two female connectors configured to form a resealable interlocking bond with a second seam member having at least two arm members which together form at least two female connectors, wherein said first member at least two arm members engage said second member at least two female connectors and said second member at least two arm members engage said first member at least two female connectors to form said resealable interlocking bond, said air bag being inflated during deployment forcing said air bag to expand thus causing said interlocking bond to open along said seam allowing said air bag to expand outside of the vehicle seat.

5,588,672

SIDE IMPACT HEAD RESTRAINT WITH INFLATABLE DEPLOYMENT

James P. Karlow, Milford; Mohamed Boumarafi, Rochester Hills, and Jonathan P. Hurford, Lake Orion, all of Mich., assignors to Takata, Inc., Auburn Hills, Mich.

Filed Oct. 20, 1995, Ser. No. 545,944
Int. Cl.[6] B60R *21/22*
U.S. Cl. 280—730.2 **20 Claims**



1. A side impact head restraint system for cushioning a vehicle occupant's head during a side impact collision including means for sensing the side impact collision and generating a crash signal thereupon, said system comprising:

a restraint curtain mounted inside the vehicle adjacent a window area of a side door of the vehicle, said curtain having at least three securing points, wherein first and second securing points are fixedly attached on an upper rail of said side door and a third securing point is movably mounted on a generally vertical track located adjacent a track edge of said window area, said track running along said track edge from an upper edge toward a lower edge of said window area, said first securing point being located near said upper edge and a rear edge of said window area and said second securing point being located near said upper edge and a forward edge of said window area;

an inflatable member carried by said restraint curtain;

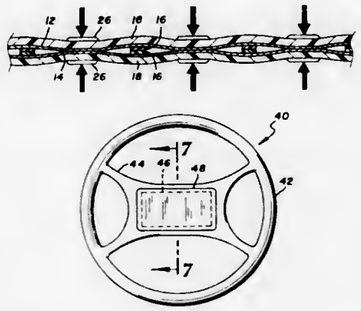
a gas generator in fluid communication with said inflatable member, said gas generator for generating gas in response to said crash signal wherein said generated gas inflates said inflatable member causing said third securing point to move along said track, driven by said inflatable member, from an undeployed position near said upper edge of said window area to a deployed position near said lower edge of said window area thereby pulling said curtain into a deployed condition covering at least a portion of said window area thus providing restraint for the vehicle occupant's head, wherein said third securing point locks into position at the end of travel along said track when said curtain is fully deployed.

5,588,673

MEMBRANE SWITCH FOR USE OVER A STEERING WHEEL AIRBAG ASSEMBLY

Mark Green, Eden Prairie, and Robert B. Hartline, Richfield, both of Minn., assignors to The Bergquist Company, Minneapolis, Minn.

Filed Feb. 1, 1994, Ser. No. 189,936
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—731 **18 Claims**



1. A membrane switch, comprising:

a pair of flexible, opposing, planar conductive electrodes electrically isolated from one another, each said opposing electrode having an outer surface and an inner surface, said inner surfaces opposing one another, each of said outer surfaces having a continuous flexible non-conductive layer disposed thereon;

a generally planar dielectric member disposed between said opposing electrodes having a high-density pattern of interlaced wall portions defining a plurality of geometric shapes having an axis, said geometric shapes defining a plurality of opposing electrode contact portions on said inner surfaces of said opposing electrodes which remain unobstructed by said dielectric member; and

a plurality of outwardly extending protrusions disposed as a high density pattern on the outer surface of each said nonconductive layer, each of said plurality of outwardly extending protrusions having an axis and being arranged in generally axially aligned relation with each of said plurality of opposing electrode contact portions, such that pressure exerted on each said outwardly extending protrusions causes the correspondingly aligned, opposing electrode contact portions to make electrical contact with one another.

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5,588,674

INTERVENING CLOTH ON AN AIR BAG

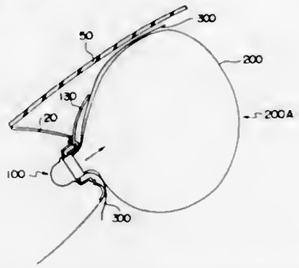
Toshifumi Yoshimura; Ryo Kikuchi, and Shoji Inuma, all of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed May 3, 1995, Ser. No. 434,301

Claims priority, application Japan, Oct. 7, 1994, 6-244298

Int. Cl.[6] B60R *21/22;21/16*

U.S. Cl. 280—732 **5 Claims**



1. An air bag device for installation in a dash board of a vehicle, said air bag device comprising:

a case having an open side and adapted to be inserted into an opening of a dash board of a vehicle;

an air bag having an open end, said air bag being folded within said case with the open end secured to said case adjacent the open side thereof, said air bag being inflatable to deploy out from said case through the case open side and the dash board opening and into the interior of the vehicle;

a door of predetermined width and height, said door closing said case open side with said air bag folded therein and being adapted to be opened upon inflation of said air bag to permit said air bag to deploy into the interior of the vehicle;

a substantially planar intervening cloth secured between said air bag and said door and adapted to intervene between said air bag and said door as said air bag is inflated, said intervening cloth having a length permitting said intervening cloth to extend beyond said door and into the interior of the vehicle and to intervene between said air bag and interior components of the vehicle as said air bag deploys.

5,588,675

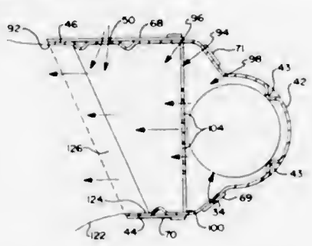
AIR BAG MODULE WITH GAS AUGMENTATION

John A. Lotspih, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 169,124, Dec. 20, 1993, abandoned. This application Jun. 19, 1995, Ser. No. 491,807

Int. Cl.[6] B60R *21/30;21/20*

U.S. Cl. 280—738 **13 Claims**



5. An air bag module comprising:

an inflatable air bag having an inflation opening;

an inflator for discharging inflation gas upwardly towards the inflation opening to inflate the air bag;

a container for housing the air bag and inflator, the container including longitudinally elongated side walls and end walls interconnecting the side walls and defining an upper air bag deployment opening;

one of the side walls being generally planar in a vertical direction parallel to the discharging inflator gas, the side wall being laterally spaced apart from the inflator;

the one of the side walls having a plurality of aspiration holes therein to aspirate ambient air to augment the discharging inflation gas during air bag inflation and for venting the inflation gas to facilitate air bag collapse;

at least one longitudinally extending rib disposed on the one of the side walls and projecting inwardly into the container, the rib being located directly beneath the plurality of aspiration holes, the rib being vertically spaced above the inflator in the direction of the discharging inflation gas such that discharging inflation gas passes over the rib prior to passing over the plurality of aspiration holes and creates a pressure drop over the aspiration holes located above the rib to cause augmentation of ambient air aspiration during air bag inflation.

5,588,676

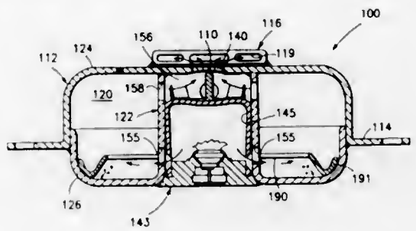
STAMPED METAL TOROIDAL HYBRID GAS GENERATOR

Randall J. Clark, Pleasant View; Bradley W. Smith, Ogden; Kirk H. Rasmussen, West Point, all of Utah, and Leland B. Kort, Lakewood, Colo., assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 321,786, Oct. 12, 1994, Pat. No. 5,516,147. This application Mar. 14, 1996, Ser. No. 615,898

Int. Cl.[6] B60R *21/28*

U.S. Cl. 280—741 **10 Claims**



1. A hybrid inflator comprising a housing having:

A) an upper stamped metal housing part including a top wall and a cylindrical sidewall depending therefrom;

B) a lower stamped metal housing part including a bottom wall, a cylindrical sidewall extending upwardly therefrom and engaged with the cylindrical sidewall of the upper housing part and welded thereto, and a generally cylindrical center tie integrally formed in one piece with the bottom wall and extending from the bottom wall to the top wall and welded to the top wall;

C) an upper wall integrally formed in one piece with one of the upper or lower housing parts and extending across the upper end of the center tie;

D) the housing defining a gas storage chamber surrounding the center tie and the center tie defining at least one inlet opening to the gas storage chamber and the housing further defining a rupturably sealed outlet orifice from the gas storage chamber; and

E) an igniter assembly mounted in the center tie and including a pyrotechnic gas generant material for producing and delivering hot gasses to the gas storage chamber through the inlet opening thereto.

5,588,677

SAFETY BELT TENSIONER FOR MOTOR VEHICLES

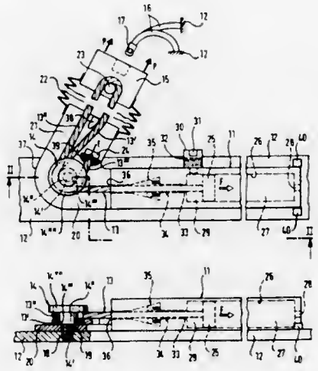
Robert Kopetzky, Lonsee, and Günther Häge, Langenau, both of Germany, assignors to Takata (Europe) Vehicle Safety Technology GmbH

Filed Jun. 19, 1995, Ser. No. 492,286

Claims priority, application Germany, Jun. 23, 1994, 44 22 022.7

Int. Cl.[6] B60R *22/36*

U.S. Cl. 280—806 **20 Claims**



1. Safety belt tensioner for motor vehicles which can be mounted on a vehicle chassis (12), the tensioner comprising an elongate drive device (11) which is to be arranged substantially horizontally in the motor vehicle, a flexible draw element (13) which is displaceable in its longitudinal direction by the drive device (11) and which is guided upwardly from the drive device (11) via deflection member (14), which is secured to the vehicle chassis (12), to a belt lock part (15) which cooperates with a counter-piece (17) arranged at the end of a three-point belt or of a lap belt (16) and which is mounted there so as to transmit a tensile force, characterised in that:

the deflection member (14) is simultaneously designed as a mounting element which secures the drive device (11) to the vehicle chassis (12), and is directly and firmly connectable to the vehicle chassis (12);

the deflection member has a bolt or sleeve section (14') mountable to the vehicle chassis (12) and a deflection section (14");

and

the deflection section (14") has a round peripheral surface which is dimensionally matched to the draw element (13) and which projects radially outwardly beyond the bolt or sleeve section (14') to form ring step (14'") between the bolt or sleeve section and the deflection section; and

a projection (20) of the drive device (11) having a through bore (19) through which the bolt or sleeve section can be inserted with the ring step abutting and pressing against the projection.

5,588,678

TALKING TRADING CARD

Steven R. Young, Dallas, Tex., assignor to Great Western Press, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 265,961, Jun. 27, 1994. This application Mar. 14, 1995, Ser. No. 403,637

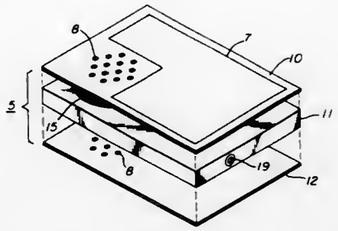
Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—67 **7 Claims**

1. A method of providing a consumer with information concerning a particular subject with the use of a talking trading card comprising the steps of:

providing a substrate housing having a top and a bottom side;

attaching a trading card surface to each side of said housing;



providing indicia on at least one of said trading card surfaces pertaining to a person, place, object, or cartoon character;

providing a voice-chip circuit in the housing for storing a predetermined voice message that is related to the printed indicia to create a talking trading card;

energizing the voice chip through power terminals thereon;

coupling a loudspeaker means in the housing to the voice-chip circuit for generating the message audibly; and

coupling switch means to the voice-chip circuit for selectively causing the voice-chip circuit to provide the consumer with the predetermined talking trading card voice message through the loudspeaker.

5,588,679

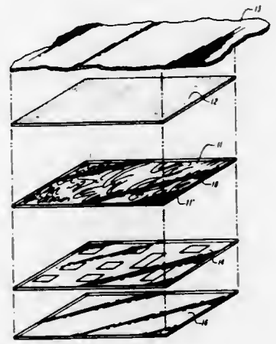
TAMPER RESISTANT LABELING

Richard T. Skov, Spencer, and John R. Pennace, Paxton, both of Mass., assignors to FLEXcon Company, Inc., Spencer, Mass.

Continuation of Ser. No. 875,552, Apr. 24, 1992, abandoned, which is a continuation of Ser. No. 162,239, Feb. 29, 1988, abandoned, which is a division of Ser. No. 941,998, Dec. 15, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 479,553

Int. Cl.[6] B42D *15/00;* **B32B** *7/10*

U.S. Cl. 283—67 **25 Claims**



1. A method of producing a coated label material, comprising the steps of:

providing a film;

applying a light transmitting layer as a predetermined indicia which is initially visible to selected areas of a surface of said film while allowing other areas of said surface to remain exposed; and

adhering a continuous light transmitting coating to said layer and to the exposed areas of said surface, wherein

said coating and said layer forming said indicia have indices of refraction which render said coating and said layer visually indiscernible with respect to one another.

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5,588,680

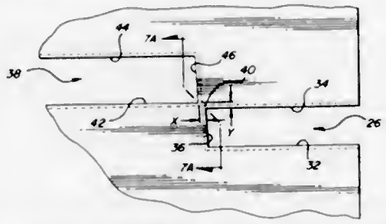
PIPE LAP JOINT WITH IMPROVED COLLAPSIBLE SEALING ZONE

Scott T. Cassel, Bloomfield Hills, and Michael E. Amedure, Orion, both of Mich., assignors to BKS Company, Birmingham, Mich.

Continuation-in-part of Ser. No. 359,531, Dec. 20, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 566,726

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—3 **18 Claims**



1. In a coupling for a pipe lap joint of the type comprising:

an inside pipe and an outside pipe having respective pipe walls in telescoping relationship which provides an overlap region on the end of each pipe, said overlap region on the outside pipe including a pair of slots, the first slot of said pair having first and second sidewalls extending axially inwardly from the end of said outside pipe and terminating in an inner end wall within said overlap region, and the second slot of said pair being spaced inwardly from the end of said outer pipe and circumferentially offset from said first slot and having first and second sidewalls extending inwardly from an outer end wall to an inner end wall, a clamping band disposed around said outside pipe and covering said second slot and the inner end of said first slot, tightening means for clamping said band around said outside pipe to clamp the pipes together and collapse outer pipe into close fitting engagement with said inner pipe within the overlap region to cause sealing engagement of said outer pipe with said inner pipe and with said band, the improvement wherein:

said first sidewalls of the first and second slots are disposed with the outer end of the first sidewall of the second slot circumferentially offset from the inner end of the first sidewall of the first slot, said first sidewalls being connected together by a frangible bridging segment of the wall of the outside pipe,

and said end walls extend transversely of said first sidewalls,

whereby said first and second slots are substantially isolated from each other when said frangible bridging segment is deformed and when it is fractured into two parts by collapse of the overlap region of said outer pipe.

5,588,681

VALVE MOUNTING DEVICE USEFUL WITH FLEXIBLE PIPE

Alan D. Parks, 1351 Charlotte St., Altamonte Springs, Fla. 32701

Filed Aug. 1, 1994, Ser. No. 283,735

Int. Cl.[6] F16L *5/00*

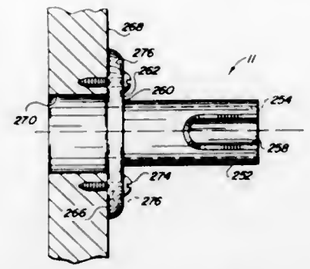
U.S. Cl. 285—46 **9 Claims**

1. A mounting device useful with a valve communicating with flexible pipe, the device comprising:

means for guiding a flexible pipe through a predetermined orientation, the guiding means adapted for engaging and holding the pipe for communicating with a valve;

means for affixing the guiding means to a structural support, the support sufficiently rigid for holding the guiding means in a fixed position; and

means for positioning a valve communicating with the flexible pipe, the valve having a supply tube exit portion extending radially therefrom, the positioning means having a tubular



sleeve for receiving the valve, the tubular sleeve affixed to and communicating with the guiding means for receiving the flexible pipe, the tubular sleeve further having a notch at an exit end for receiving the supply tube exit portion for preventing valve rotation during valve operation.

5,588,682

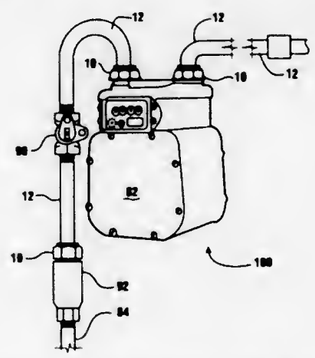
ELECTRICALLY INSULATING GAS LINE SYSTEM

Dean E. Breese, Upper Arlington, Ohio, assignor to Schwler Manufacturing Company Inc., Hilliard, Ohio

Filed Jun. 26, 1995, Ser. No. 494,985

Int. Cl.[6] F16L *55/00;19/02*

U.S. Cl. 285—52 **19 Claims**



1. A system for electrically insulating conduits carrying combustible gas comprising:

a gas meter including a threaded spud;

an electrically conductive conduit portion, said conduit portion having an annular longitudinal end, wherein said end includes an opening, said opening adapted for flow of combustible gas therethrough, and further comprising an annular radially extending conduit flange portion, and an annular tapered portion longitudinally disposed from said conduit flange portion;

a generally annular, continuous electrically insulating portion attached to said longitudinal end, said insulating portion extending in surrounding relation of said longitudinal end, said insulating portion including an annular radially outward extending insulating flange portion and a neck portion extending from said insulating flange portion in a longitudinal direction and away from said opening, wherein said conduit flange portion underlies said insulating flange portion both longitudinally and radially, and wherein said annular tapered portion of said conduit portion has a tapered portion diameter greater than a neck diameter of said neck portion, and wherein said tapered portion diameter of said tapered portion of said conduit terminates at a

generally radially extending step, wherein said step is in close adjacent longitudinal relation with said neck portion; and

a nut portion, said nut portion including a nut aperture, said neck portion extending through said nut aperture, said nut portion further including an annular, radially inward extending lip portion bounding said aperture, and an annular threaded portion longitudinally disposed from said lip portion, wherein said threaded portion is engageable with said spud, and said lip portion is engageable with said insulating flange portion.

5,588,683

ANTI-RESONANCE PIPE CLIP

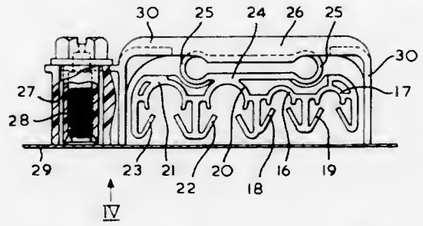
Lothar Schliessner, Linden, Germany, assignor to Emhart, Inc., Newark, Del.

Filed Jan. 19, 1995, Ser. No. 374,068

Claims priority, application Germany, Jan. 27, 1994, 9401393 U

Int. Cl.[6] F16L *3/08;3/22*

U.S. Cl. 285—62 **3 Claims**



1. A resilient pipe clip for supporting elongated tubular objects in an automobile so as to reduce vibration thereof, said clip comprising

a support mount adapted to be attached to and supported on a surface in an automobile;

a web member extending from said support mount, said web member being spaced from and generally parallel to the surface;

at least one article securing member for receiving and retaining a tubular object, said article securing member being disposed on the side of said web facing the surface;

a flexible bridge member attached to said article securing member; and

a pair of curved flexing elements each connected to one end of said bridge member and to said web to resiliently support said bridge member in a position spaced from said support mount to reduce vibration of the tubular object.

5,588,684

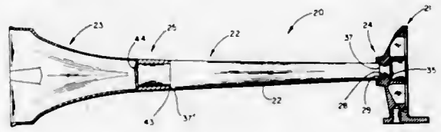
NON-ROTATABLE MECHANICAL ATTACHMENT AND METHOD THEREFOR

James Kiefer, Grand Rapids, Mich., assignor to RAN Enterprises, Inc., Grand Rapids, Mich.

Filed May 24, 1995, Ser. No. 449,094

Int. Cl.[6] F16L *3/00*

U.S. Cl. 285—62 **20 Claims**



1. A mechanical connection comprising:

a first member including receiving structure defining a generally cylindrically-shaped hole with a longitudinal axis and first and second laterally extending shoulders located at opposite ends of the hole;

a tubular member having an end section shaped to mateably engage the cylindrically-shaped hole, said end section including a flared end and a circumferentially extending ridge spaced from said flared end, said ridge and said flared end engaging said first and second laterally extending shoulders, respectively;

said first laterally extending shoulder being circumferentially uniform so that the tubular member can be extended into the hole and the ridge engaged with the first shoulder without regard to angular orientation of the tubular member relative to the first member; and

said second laterally extending shoulder being ring-shaped but including radially-extending depressions and being circumferentially non-uniform, said flared end including material flared after engagement of the end section with the hole that engages said non-uniform second shoulder to prevent rotation of said tubular member relative to said first member, whereby said first member and said tubular member are fixedly mechanically connected both axially and non-rotatably by engagement of said first shoulder and said ridge, and by interlocking engagement of said second shoulder and said flared end.

5,588,685

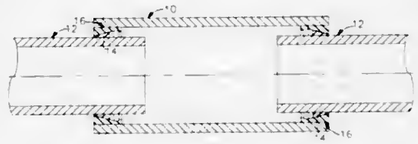
PUSH-PULL PIPE JOINT

Joie L. Folkers, Wichita Falls, Tex., assignor to Ameron International Corporation, Pasadena, Calif.

Filed Jul. 6, 1995, Ser. No. 498,983

Int. Cl.[6] F16L *7/00*

U.S. Cl. 285—94 **26 Claims**



1. A push-pull pipe joint for connecting a smaller pipe to a larger pipe, wherein the larger pipe has an inside diameter larger than the outside diameter of the smaller pipe and one end of said smaller pipe is positioned within said larger pipe, comprising:

an inner annular gasket having an inside diameter smaller than the outside diameter of the smaller pipe and an inclined outer surface wherein one side of the gasket is thicker than the other, wherein the inner gasket is stretch fitted over the outer surface of the smaller pipe at said one end and wherein the thickest side of the inner gasket faces said one end; and

an outer annular gasket having an outside diameter larger than the inside diameter of the larger pipe, wherein the outer gasket has an inner surface a portion of which is inclined increasing in diameter toward the inner gasket, wherein the outer gasket is compression fitted on the inner surface of the larger diameter pipe and wherein the inner gasket inclined surface slides underneath the increased diameter portion of the outer gasket and wedges against the inclined surface of the outer gasket forming a sealed joint.

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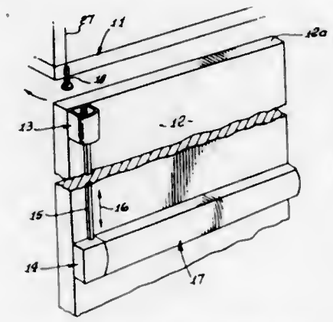
5,588,686

TEMPERATURE RESPONSIVE MECHANISM FOR CONTROLLABLY DEADLOCKING A DOOR TO A DOOR FRAME

Rory M. Riley, Santa Ana; Alan K. Uyeda, Pico Rivera, and Michael Winardi, Rowland Heights, all of Calif., assignors to Adams Rite Manufacturing Company, City of Industry, Calif.

Filed Dec. 5, 1994, Ser. No. 349,744
Int. Cl.[6] E05B *65/10*
U.S. Cl. 292—92 **16 Claims**



1. Locking and unlocking safety mechanism, for a door, comprising

a) a push mechanism including actuator means to be carried by said door,

b) a single rod operatively connected with the push mechanism to be displaced by operation of the push mechanism,

c) a single door latch mechanism operable to latch and unlatch said door in response to movement of said single rod,

d) said door latch mechanism being on said door, above the level of said push mechanism actuator means, said door latch mechanism being the only door latch mechanism on the door, said push mechanism actuator means being free of any push rod extending therebelow to any other door latch mechanism,

e) temperature responsive blocking means associated with the rod and latch mechanism to block operation of the latch mechanism to unlatch said door, in response to a predetermined increase in ambient temperature,

f) said temperature responsive blocking means including a spring-urged element and a heat fusible part blocking spring-urged movement of said element into a position to block rod movement that would otherwise unlatch the door, said heat fusible part having a fixed, non-rotatable position, and blocking movement of said element until fusing of said part.

5,588,687

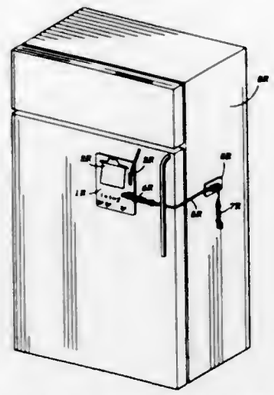
CHILD PROOF REFRIGERATOR DOOR LATCH

William R. Pinkerton, P.O. Box 3035, Brownsville, Tex. 78523

Continuation-in-part of Ser. No. 140,851, Oct. 25, 1993, Pat. No. 5,387,018. This application Aug. 11, 1994, Ser. No. 288,826
Int. Cl.[6] E05C *19/18*
U.S. Cl. 292—259 R **19 Claims**

1. A device for making a refrigerator door or other closure child resistant, comprising:

first and second mounting plates each having front and back sides and each being from about 1 square inch to 250 square inches in area and from about one sixteenth inch to one half inch thick and each having lanyard attaching means comprising a flat loop mounted to its front side in a perpendicular plane relative to the plane of the mounting plate and being tangent along a segment of said loop with said mounting plate and an adhesive surface on said back side of each mounting



plate, wherein further said loop has an inner diameter of from about one half inch to about two inches and is oval or approximately square; wherein said first and second mounting plates are made from any one or two or any combination of the following materials: wood, plastic, steel, brass, bronze, copper, stainless steel, fiberglass, aluminum, magnesium, zinc coated iron, corrosion resistant metal alloys, non photo degradable plastic;

a length of shock cord from two to thirty inches long, sometimes hereafter referred to as, lanyard, said lanyard having a limited stretch capability of from about thirty percent of diameter to about 250 percent of diameter and having first and second ends with said lanyard first end mounted to said loop on said second mounting plate;

a releasable spring clasp having a clasp end and a plain or swivel eyelet butt end mounted by said butt end to said lanyard second end for attaching said lanyard second end to said first mounting plate via the spring clasp when said first mounting plate is adhered via its adhesive backing to one part of a two part closure of the refrigerator door and said second mounting plate is mounted to the other part of said closure so that the lanyard is fully extended to slightly stretched when so connected but having enough stretching capability remaining to allow an adult to easily remove said spring clasp attached to said lanyard from said first mounting plate.

5,588,688

ROBOTIC GRASPING APPARATUS

Stephen C. Jacobsen, Salt Lake City; Dwight Potter, Stansbury Park, and Fraser Smith, Salt Lake City, all of Utah, assignors to Sarcos, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 58,690, May 7, 1993, Pat. No. 5,328,224, which is a continuation of Ser. No. 963,831, Oct. 20, 1992, abandoned, which is a continuation of Ser. No. 563,399, Aug. 6, 1990, Pat. No. 5,172,951. This application Jul. 8, 1994, Ser. No. 272,196
Int. Cl.[6] B25J *15/10*
U.S. Cl. 294—106 **39 Claims**

1. Robotic gripping apparatus comprising:

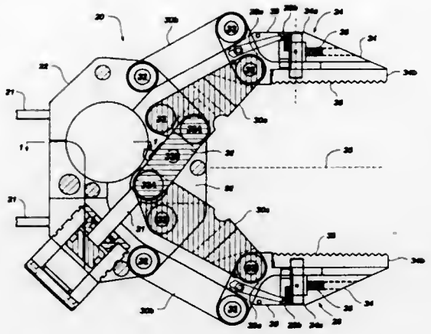
a support base, and

first and second fingers attached at proximal ends to the support base to extend forwardly therefrom, and selectively moveable in a plane toward or away from one another, each of said fingers including

a base section attached at one end to the support base, and

a tip section pivotally attached at a pivot end to the other end of the base section and pivotable downwardly in a direction generally normal to the plane of movement of the fingers, and

a facing side facing the other finger, each facing side including



a first plurality of substantially rigid protuberances projecting toward the other facing side, and

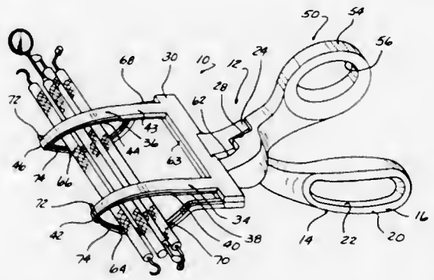
a second plurality of substantially flexible, resilient protuberances projecting toward the other facing side.

5,588,689

DENTAL INSTRUMENT HOLDER

Eric W. Ochs, 22448 Hoffman, St. Clair Shores, Mich. 48082

Filed Apr. 7, 1995, Ser. No. 418,202
Int. Cl.[6] B25B *7/00;* **B25J** *15/00*
U.S. Cl. 294—118 **8 Claims**



1. A dental instrument holder for releasibly holding at least one elongated, rigid dental instrument having opposed ends, the holder comprising:

first and second tong members, each including a jaw lever portion and an opposed handle portion;

means for pivotally connecting the first and second tong members for opposing pivotal movement;

each jaw lever portion including only first and second spaced jaws interconnected by a cross arm integrally extending from the handle portion;

at least one of the first and second jaws on the first and second tong members having an arcuate concave shape extending from the cross arm to an outer end; and

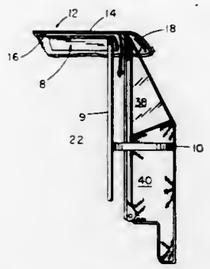
the first and second jaws on the first tong member spaced apart at a different spacing from the first and second jaws on the second tong member to dispose the first jaws and the second jaws on the first and second tong members in respective side-by-side relationship, with the outer ends of each first and second jaw pivoted beyond the outer end of the opposed first and second jaw to form a variably sized closed opening between the first and second jaws for supporting the opposed first and second ends of the at least one dental instrument.

5,588,690

DOUBLE BACK GOLF CART ENCLOSURE

Jerry M. Showalter, Wesley Chapel, Fla., assignor to Tampa G Manufacturing Co., Tampa, Fla.

Filed Dec. 8, 1995, Ser. No. 569,787
Int. Cl.[6] B60J *9/00*
U.S. Cl. 296—77.1 **11 Claims**



1. An enclosure for a golf cart or other vehicle having a roof structure secured above a body portion of the vehicle and a club carrier bracket, said enclosure comprising in combination:

a roof panel having an underside generally corresponding to the configuration of the roof structure of the golf cart, said roof panel overlying said roof structure;

a hem portion coupled to said roof panel about its periphery;

a first back cover coupled to and suspended from said roof panel about said roof panel's rearward periphery;

a second back cover coupled to and suspended from said roof panel about said roof panel's rearward periphery;

a first securing means positioned about the rearward periphery of said roof panel for retaining said first back cover under said hem portion in a rolled state; and

a second securing means positioned about the rearward periphery of said roof panel for retaining said second back cover under said hem portion in a rolled state.

5,588,691

WINDSHIELD MOLDING FOR VEHICLES AND THE PRODUCTION METHOD THEREOF

Yukihiko Yada, Nagoya, and Yoichi Hirai, Ohbu, both of Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan

Continuation of Ser. No. 168,192, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 30,066, Mar. 24, 1993, abandoned. This application Jan. 3, 1996, Ser. No. 582,598
Claims priority, application Japan, Jul. 25, 1991, 3-208600
Int. Cl.[6] B60J *1/02*
U.S. Cl. 296—93 **23 Claims**

1. A windshield molding for vehicles having an upper molding section and a side molding section to be fitted along the periphery of the windshield glass fitted into the window frame opening of the body panel and further including a corner molding section interconnecting the upper molding section and the side molding section, said windshield molding comprising:

a support leg located between the periphery of said windshield glass and an inner edge of the window frame opening of the body panel, a decorative portion provided on the outside edge of the support leg to cover-said space from the outside, said support leg having an enlarged thickened section along the side molding section and a rainwater groove opening to the inner periphery of the windshield molding,

wherein said decorative portion has a outer contour extending throughout the entire length of the windshield molding and is projected outwards apart from the windshield glass surface at least along a part of the side molding section,

said enlarged thickened section is located between the decorative portion and an outer surface of the windshield glass, said

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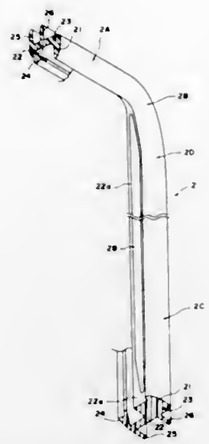


enlarged thickened section increasing in height from said corner molding section and extending along said side molding section with a substantially uniform height to a lower portion of the side molding section, said enlarged thickened section additionally completely surrounding upper and lower ends of the rainwater groove, and

said rainwater groove is provided in the enlarged thickened section of said support leg wherein a depth of the groove is changed along a longitudinal axis of the windshield molding.

8. A windshield molding for vehicles having an upper molding section and a side molding section to be fitted along the periphery of the windshield glass fitted into the window frame opening of the body panel and further including a corner molding section interconnecting the upper molding section and the side molding section, said windshield molding comprising:

a support leg inserted into a space between the periphery of said windshield glass and an inner edge of the window frame opening of the body panel, a decorative portion provided on the outside edge of the support leg to cover said space from the outside, and a rainwater groove opening to the inner periphery of the windshield molding,

wherein said rainwater groove is provided at a central portion of the side molding section, said support leg along the side molding section having an enlarged thickened section, said enlarged thickened section increasing in height from said corner molding section and along said side molding section, said enlarged thickened section additionally completely upper and lower ends of the rainwater groove.

5,588,692

PUSH-OUT VEHICLE SIDE DOOR

Umesh N. Gandhi, Grand Blanc, and Douglas J. Osmak, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1995, Ser. No. 541,165

Int. Cl.[6] B60R *21/04*

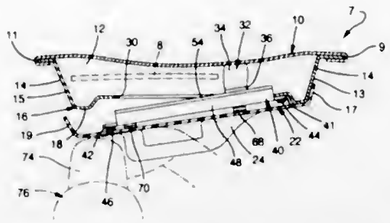
U.S. Cl. 296—146.7 **10 Claims**

1. An automotive vehicle door comprising:

a first generally rigid outer structure having first and second ends;

a second generally rigid inner structure with a major portion spaced from the first outer structure, the second inner structure having first and second ends generally positionally aligned with the first and second ends of the first outer structure, the second inner structure having an opening;

a trim panel positioned generally adjacent the second inner structure;



a target positioned in alignment with the opening of the second inner structure adjacent the first end of the second inner structure, the target also having a portion adjacent the first outer structure; and

a beam having a first end generally fixed with respect to the second inner structure first end and a second end fixed with respect to the second inner structure second end, the beam crossing over the target straddling and a portion of the opening of the rigid inner structure and wherein an impact on the door first outer structure causes the target to move inwardly through the opening, contacting the beam between the beam first and second ends to force the beam second end to dislodge the trim panel from the second inner panel end and move the trim panel inwardly.

5,588,693

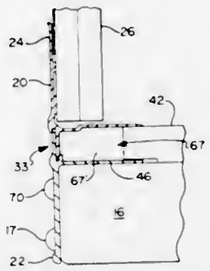
MODULAR TRUCK CARGO AREA BODY

Roy C. Higginson, Ramsden Farm Box 4000 Rd. 4, Birdsboro, Pa. 19508, and Paul L. Whiteman, R.D. #1 Box 63, Morgantown, Pa. 19543

Filed Aug. 31, 1994, Ser. No. 299,219

Int. Cl.[6] B60R *27/00*

U.S. Cl. 246—183 **19 Claims**



1. A modular frame structure for a cargo area body of a truck comprising:

(a) first and second spaced apart substantially co-planar bottom rails, each bottom rail comprising:

(1) a lower rail portion attachable to a truck sub-structure of a truck;

(2) an upper rail portion which interlockingly engages the lower rail portion;

(3) means for interlockingly engaging the lower rail portion and the upper rail portion;

(4) means for sealing disposed proximate the means for interlockingly engaging, the means for sealing comprising at least an elongated O-ring seal;

(b) first and second spaced apart substantially co-planar top rails, each top rail being associated with a corresponding bottom rail, each top rail comprising:

(1) a side rail portion;

(2) a roof rail portion which interdigitately engages the side rail portion;

(3) means for interlockingly engaging the side rail portion and the roof rail portion;

(4) means for sealing disposed proximate the means for interlocking engaging, the means for sealing comprises at least an elongated an O-ring seal;

(c) at least one side wall support extending between each associated bottom rail and top rail and secured thereto; and

(d) a roof structure extending between the top rails.

5,588,694

ARRANGEMENT FOR INCREASING THE BUCKLING STRENGTH OF WINDSHIELD PILLARS OF A VEHICLE

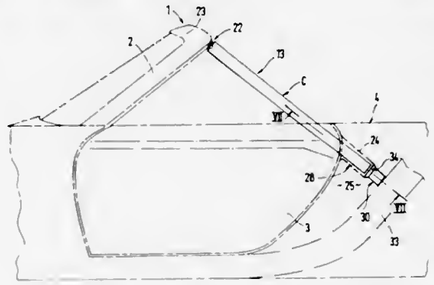
Robert Koehr, Neustadt, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Dec. 6, 1994, Ser. No. 354,068

Claims priority, application Germany, Dec. 6, 1993, 43 41 499.0

Int. Cl.[6] B60R *21/02*

U.S. Cl. 296—188 **12 Claims**



1. An arrangement for increasing the buckling strength of windshield pillars of a vehicle having a lateral vehicle door, comprising:

at least one supporting strut;

an activating device, said at least one supporting strut interacting with said activating device and extending approximately in a longitudinal direction of the vehicle, said supporting strut being aligned approximately horizontally in a deposited position and extending in an upper area of the lateral vehicle door having an inside door panel;

a guide rail located on the windshield pillar, wherein an end of the supporting strut facing the windshield pillar, in a danger event, is moved upwards by said activating device along the guide rail to an upper end area into an operative position;

an impression formed in the vehicle door facing a passenger compartment, said supporting strut being detachably fixed on said impression in a deposited position;

wherein said supporting strut is completely uncoupled from the vehicle door in a swivelled-up position and said operative position; and

a receiving device arranged adjacent to the vehicle door and being fixed at a body side of the vehicle, wherein in said operative position said supporting strut is connected on one side in a force-transmitting manner with the upper end area of the windshield pillar and, on the other side, with said receiving device.

5,588,695

FOLDABLE BEACH CHAIR

Daniel Gomes, P.O. Box 117, Worcester, N.Y. 12197-0117

Continuation-in-part of Ser. No. 553,163, Jul. 13, 1990, abandoned. This application May 19, 1995, Ser. No. 444,656

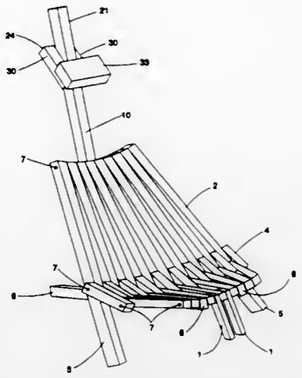
Int. Cl.[6] A47C *4/00*

U.S. Cl. 297—56 **21 Claims**

14. A foldable chair comprising:

a) back members joined together along the top of said chair;

b) seat members joined together along the front of said chair;



c) intermediate seat members interlaced between said back and said seat members and joined to each of said back and seat members such that flexible and pivotable joints are formed from connections of one end of said intermediate members to said back members and from connection of the other end of said intermediate members to said seat members;

d) leg members extending from said back members and said seat members such that said chair is supported when folded open for use and placed upon a flat surface;

e) at least one tip prevention member joined along the front of said chair between said seat members such that said tip prevention member can be alternately extended downward or stored when said chair is in use and contacts said flat surface when a person is seated in said chair and said tip prevention member prevents said chair from tipping forward.

f) means for joining said back, seat and intermediate members of said chair together.

5,588,696

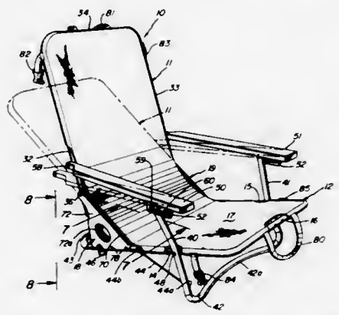
CONVERTIBLE CHAIR WITH ARMRESTS WHICH CONVERTS TO A BACKPACK

John C. Jay, 18 Sea St., Manchester, Mass. 01944, and Clay A. Burns, 8 Claremont Park #2, Boston, Mass. 02118

Filed Jun. 29, 1995, Ser. No. 496,450

Int. Cl.[6] A47C *4/42*

U.S. Cl. 297—129 **18 Claims**



1. A backpack assembly which is convertible to a multiposition chair comprising:

generally parallel front and back panels having tops and bottoms, said front panel intended to be closer to the back of a person carrying the assembly as a backpack;

said front panel including a front cross bar and left and right front vertical side bars lying in a first plane, said back panel

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having a back cross bar and left and right back vertical side bars lying in a second plane;

left and right base members each rigidly attached to a lower portion of the left and right side bars of the front panel, respectively; and pivotally attached to the lower portion of each left and right side bar of the back panel, respectively; said base members establishing a substantial gap between the front and back panels when the assembly is in the backpack configuration defining the substantial carrying volume of the backpack;

at least one strap attached to the assembly for mounting the assembly on a person's back;

rigid cross member having ends rigidly attached to each side bar of said front panel and forming a bottom support when the assembly is configured as a backpack; said cross member forming a ground based leg support when the assembly is configured as a chair;

left and right armrests, one each pivotally mounted to the back panel side bars, a bracket mounted on each of the left and right armrests at the ends of the armrests remote from the pivot mounts, each bracket having an elongated aperture; and

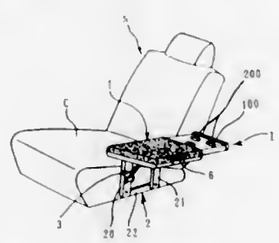
left and right armrest posts each having one end pivotally engaged with the apertures of the left and right armrest brackets, respectively, and a central portion pivotally attached to the left and right side bars of the front panel, whereby the assembly changes into a chair configuration when the back panel is angularly displaced relative to the front panel.

5,588,697

TABLE MEANS FOR VEHICLE

Masami Yoshida, Utsunomiya, and Hidetsugu Okazaki, Wako, both of Japan, assignors to Tokyo Seat Corporation, Saitama-ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed May 19, 1995, Ser. No. 445,301
Claims priority, application Japan, May 23, 1994, 6-133788
Int. Cl.[6] A47B *39/04;83/02*
U.S. Cl. 297—173 **16 Claims**



1. Table means for a vehicle comprising:

a table body;

support means for attaching to a side of a vehicle seat for pivotally supporting said table body;

linkage means provided between said table body and said support means for facilitating maintaining of said table body in a horizontal state during use of said table body and facilitating collapsing of said table body after use of said table body; and

operating means for operating said linkage means;

said operating means comprising lever means pivotally connected to said table body, bracket means including a first bracket member and a second bracket member, and an operating bar having a first end portion and a second end portion;

said first bracket member being attached to said table body;

said operating bar being connected at said first end portion thereof to said lever means and movably coupled at said second end portion thereof to said bracket means; and

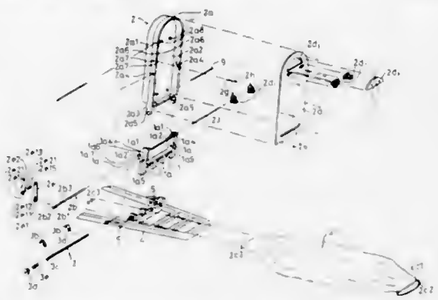
said linkage means and said second bracket member being pivotally connected to said first bracket member.

5,588,698

RECLINABLE MOTORCYCLE BACKREST WITH SADDLE CUSHION COVER HAVING SUN RAY BLOCKING FUNCTION

Tien-Chu Hsueh, 467, Yuan-Shan Rd., Chung-Ho City, Taiwan

Filed May 23, 1994, Ser. No. 247,900
Int. Cl.[6] A47C *7/62*
U.S. Cl. 297—184.11 **5 Claims**



1. A reclinable motorcycle backrest having a sun-shielding saddle cover and being mounted on a motorcycle cargo rack, comprising:

a support bracket mounted on the motorcycle cargo rack having a set of receptacles, each of said receptacles being provided with one of a corresponding set of arresting recesses; and

a backrest assembly including: a main body having a soft pad on one side and a retraction compartment on another side, said main body being jointed pivotally at bottom ends with said support bracket; a scroll having one flat end protruding out of said main body; a roll of sun-shielding cloth having one end fixed onto said scroll; a back-cover board having a slot for covering said roll of sun-shielding cloth stored in said retraction compartment wherein said sun-shielding cloth is pulled out through said slot; a crank bar having a cranking hole composed of a long hole and a round hole formed at one end; and a pivotal rod having two latching ears at each end, each of said latching ears latching onto one of said set of arresting recesses, thereby stopping said backrest assembly from reclining down.

5,588,699

INFLATABLE SAFETY CUSHION

Christopher Rundle, 12598 SW. 60th Ct., Miami, Fla. 33156, and Michael Borell, 7787 SW. 86th St., Apt. 310, Miami, Fla. 33143

Filed Aug. 3, 1995, Ser. No. 510,602
Int. Cl.[6] B60J *1/42*
U.S. Cl. 297—216.11 **15 Claims**

1. A safety device for a child used in combination with a seat belt harness, said device comprising:

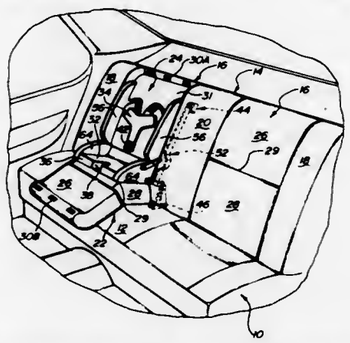
a one-piece inflatable structure defined by a front side surface spaced apart from a rear side surface by a continuous outer side wall, said structure delineated by an upper section having a width approximating the width of a child's head, a middle section having a width approximating the width of a child's torso, and a lower section having a width approximating the width of a child's thighs; an aperture centrally disposed in said upper section and sized for placement over a child's head, an inner side wall having a minimal spacial separation from said outer side wall defining said upper section; an inlet means for inflating said structure; said structure placed beneath a seat belt harness for securing said structure to the child wherein a child's head is inserted through said aperture with said middle section residing against the torso of the child and said lower section placed over the thighs of the child whereby a seat belt harness placed over the front surface of said structure allows said structure to be inflated through said inlet means to remove excess space between the seat belt harness and child providing the child with a properly positioned restraint that further operates as an air cushion.

5,588,700

CHILD SAFETY SEAT WITH SIDE BOLSTERS

Robert I. Homier, Plymouth, Mich., assignor to Douglas & Lomason Company, Farmington Hills, Mich.

Filed Feb. 28, 1994, Ser. No. 202,998
Int. Cl.[6] B60N *2/30*
U.S. Cl. 297—238 **9 Claims**



1. A child seat adapted to be integrated into a vehicle seat and movable from a stowed position to a deployed position relative to the vehicle seat by reclining a seatback member and lowering a seat member, the improvement comprising interconnection means associated with said seatback member and said seat member for automatically reclining said seatback member in coordination with lowering of said seat member, said interconnection means including a first link and a second link on each lateral side of the child seat has been inserted before "each" and each having a first end with a first pivot and a second end with a second pivot, each of said first pivots and each of said second pivots directly pivotably connected to said seat member and to said seatback member respectively; one of said second pivots on each lateral side being pivotably connected to an upper end of the seatback member.

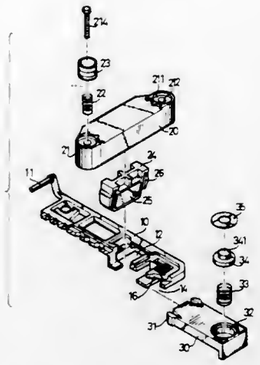
5,588,701

DEVICE FOR MOUNTING BABY CHAIR TO BICYCLE

Shi W. Chuang, No. 7th Floor-8, No. 20, Ta Lon Road, Taichung, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,355
Int. Cl.[6] A47D *1/10*
U.S. Cl. 297—256.16 **3 Claims**

1. A baby chair and rack combination comprising:



a rack including a front portion and including a rear portion having a puncture formed therein, and including a channel laterally formed in said rear portion and communicating with said puncture, said rack including an orifice formed in said rear portion thereof and communicating with said channel,

a baby chair including a front portion for engaging with said front portion of said rack and including a rear portion having a base secured thereto, a block secured to said base for engaging in said puncture of said rack and having a first securing means for engaging with said rack so as to secure said base to said rack, said block including an aperture formed therein for aligning with said channel of said rack, and

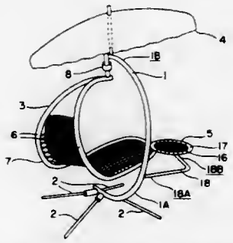
a catch means for engaging in said channel of said rack and in said aperture of said block, said catch means including a second securing means for engaging with said block so as to secure said catch to said block, said catch means including a cavity formed therein for slidably engaging with a button, and said catch means including means for biasing said button outward of said catch means so as to engage said button in said orifice and so as to further secure said catch means to said rack.

5,588,702

GARDEN ROCKING-CHAIR

Stanislaw Litwin, Przybyslawice 96, 63-400 Ostrow Wielkopolski, Poland

Filed Aug. 28, 1995, Ser. No. 519,766
Claims priority, application Poland, Jul. 28, 1995, 309835
Int. Cl.[6] A63G *9/00*
U.S. Cl. 297—277 **2 Claims**



2. A rocking-chair characterized by a bracket support having an upper part, having a lower part with legs, and having a pallet that is pendulously attached and that has a bottom portion, characterized in that the pallet is formed of a tubular frame with a material stretched upon it and is suspended on the bracket support by a lifting joint that comprises an eye-bolt covered with a cylindrical, metallic shield attached to the bracket support, an intermediate link and a hook covered with a cylindrical shield welded onto the frame

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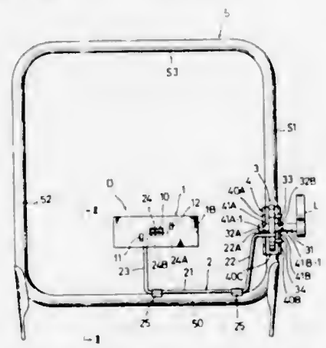
of the pallet, and the cylindrical shields are covered by an elastic bellows jacket, and furthermore the legs of the rocking-chair are slidably fixed together and secured by screws into four tubular elements welded onto the lower part of the bracket support, and furthermore the rocking chair has a tangent umbrella separably attached to the upper part of the bracket support and on a definite height above the bottom level portion of the pallet and has a grading arm with a first end separably attached to the bracket support and with a second end terminating in a table top, and the table top comprises a tubular frame with a material stretched upon it.

5,588,703

LUMBAR SUPPORT DEVICE FOR VEHICLE SEAT

Kenichi Itou, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1995, Ser. No. 542,190
Int. Cl.[6] A47C *3/025*
U.S. Cl. 297—284.4 **11 Claims**



1. A lumbar support device in a vehicle seat, the vehicle seat having a seat back and a seat back frame within the seat back, said lumbar support device comprising:

a lumbar plate having a connecting means provided integrally therein;

a torsion bar having a first end portion connected to said connecting means of said lumbar plate, a second end portion, and a crank portion integrally engaged between said first end portion and said second end portion;

a cramp means by which said crank portion of said torsion bar is rotatably fixed to said seat back frame;

a cam means having discrete cam surfaces on which said second end portion of said torsion bar is slidably engaged, said cam means having a shaft means provided integrally therewith;

a bracket means having a hole means with a narrowed hole means communicating with said hole means, said cam means being rotatably supported in said hole means after said shaft means on said cam means is inserted through said narrowed hole means into said hole means; and

an operation lever connected to one end of said shaft means of said cam means;

wherein said cramp means is provided integrally with a snap action means for permitting said crank portion of said torsion bar to be snap inserted therethrough and rotatably secured in said cramp means;

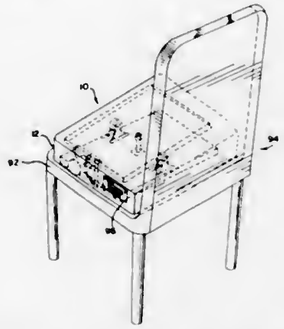
wherein said cramp means comprises at least one generally omega shaped cramp member having a generally circular body in which said crank portion of said torsion bar is rotatably secured and a securing leg portion to be welded to said seat back frame, and wherein said snap action means comprises at least one projected part formed integrally in a neck portion of said generally omega shape cramp member between said generally circular body and said securing leg portion.

5,588,704

ERGONOMIC ANTIFATIGUE SEATING DEVICE AND METHOD

Richard D. Harza, 655 Sheridan Rd., Winnetka, Ill. 60093

Continuation of Ser. No. 308,621, Sep. 19, 1994, abandoned, which is a continuation of Ser. No. 929,964, Aug. 13, 1992, abandoned. This application Apr. 15, 1996, Ser. No. 632,770
Int. Cl.[6] A61H *1/00*
U.S. Cl. 297—314 **6 Claims**



1. An ergonomic antifatigue device for moving the hips and lower midsection of a person seated in a seating apparatus, the device comprising:

a first support having a support element positioned under the hips of the seated person, said support element comprising a left side and a right side;

a central point located substantially within said support element;

a second support structure connected to said support element at said central point for maintaining said central point in a substantially non-moving position while allowing movement of all portions of said support element other than said central point; and

a motor and coupling connected to said first support;

said motor and coupling automatically and alternately pivoting said left side of said support element up and down about said central point, and automatically and alternately pivoting said right side of said support element up and down about said central point, thereby automatically and alternately lifting one hip of the seated person and then the other hip;

said motor and coupling also automatically and alternately rotating said support element back and forth about said central point as a series of cyclical rotations and counter-rotations, thereby cyclically moving backward and forward the hips of the seated person;

whereby motion and stimulation are translated to the seated person in a similar fashion to the motion and stimulation imparted to a person through walking.

5,588,705

SEATBACK RECLINER MECHANISM

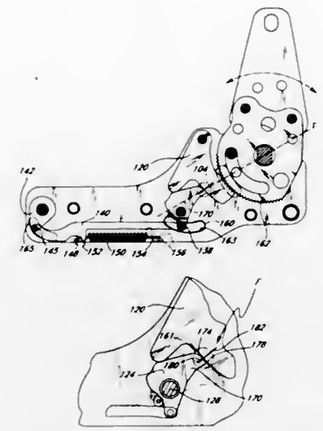
Chung L. Chang, 22834 Lazy Trail Rd., Diamond Bar, Calif. 91765

Division of Ser. No. 132,663, Oct. 6, 1993, Pat. No. 5,433,507. This application May 1, 1995, Ser. No. 431,441
Int. Cl.[6] B60N *2/02*
U.S. Cl. 297—367 **6 Claims**

1. A hinge fitting for a reclining vehicle seat structure, comprising:

a fixed support assembly comprising a pair of sandwich bracket plates;

a seatback support assembly pivotally connected to said fixed support assembly by a first pivot assembly, said seatback support assembly being movable from an upright position, rearwardly through a range of rearwardly inclined positions;



a rotatable locking member positioned at least partially between said bracket plates, pivotally connected to said fixed support assembly by a second pivot assembly, said second pivot assembly fixing said seatback support assembly in adjusted positions throughout the range of rearwardly inclined positions, said locking member defining a first face and first engagement surface, said first face and said first engagement surface being generally perpendicular to one another and intersecting along a first edge, said first face of said locking member defining a first alignment marking extending substantially to said first edge;

a lock actuator assembly, said lock actuator assembly including a rotatable cam pivotally connected to said fixed support assembly by a third pivot assembly, said cam defining a second face and a second engagement surface, said second face and said second engagement surface being generally perpendicular to each another and intersecting along a second edge, said second face of said cam defining a second alignment marking extending substantially to said second edge, said second engagement surface engageable with said locking member to cam said locking member into said locking position and engaging said locking member at an engagement point when said locking member is in said locking position;

wherein said locking member and said cam are sized and shaped such that when said first alignment marking is positioned to a predetermined side of said second alignment marking said engagement point is located such that a force acting perpendicularly at said engagement point urges said cam into engagement with said locking member, thereby preventing movement of said locking member out of said locking position in response to forces applied to said seatback support member.

5,588,706

CONTROL MECHANISM FOR THE SEAT CARRIERS OF CHAIRS, ESPECIALLY SWIVEL CHAIRS

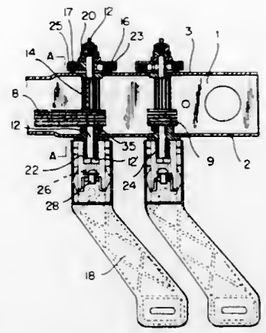
Maria Neumueller, and Angelika Gebhard, both of Burgthann, Germany, assignors to Sifa Sitzfabrik GmbH, Sulzbach-Rosenberg, Germany

Filed Oct. 14, 1994, Ser. No. 322,994
Claims priority, application Germany, Oct. 14, 1993, 43 35 017.8
Int. Cl.[6] A47C *1/027*
U.S. Cl. 297—374 **12 Claims**

1. A clamping mechanism for a seat carrier of a chair, comprising:

a fixed part;

a pivotable part;



said pivotable part being clamped and released by means of lamellae;

first ends of said lamellae being rotatably anchored to a one of said fixed and said pivotable parts without play;

second ends of said lamellae being rotatably anchored to another of said parts with play;

a locking force of said second ends pushing against a lateral inside wall of a one of said parts;

said lamellae, when locked, being released by at least one control lever acting against said locking force;

said lamellae second ends having holes through which pass a clamping bolt that can slide, inside said clamping mechanism, horizontally and transversely toward said lamellae against a spring force that causes said locking force;

said clamping bolt being fitted, on a first side of said clamping mechanism opposite to a second clamping mechanism side at which clamping action takes place, into a pressure sleeve of a diameter greater than a diameter of said lamellae second end holes;

said clamping bolt passing through said second mechanism side;

said clamping bolt having, outside said second mechanism side and at a distance from said second side, a first pressure spring and a mounting for said first pressure spring;

said first pressure spring acting between said clamping bolt and said second side to push said clamping bolt outward, thereby directing said locking force to said lamellae;

said control lever being pivotably mounted, outside said second side in a support rigidly anchored to said second side;

a pressure nose bearing against a head of said clamping bolt; and

said control lever urging said clamping bolt transversely and horizontally toward said lamellae against the force of said first pressure spring, behind said pressure sleeve, said clamping bolt having a stop that bears against said pressure sleeve at least when said clamping mechanism is activated

said support has an alignment hole for said clamping bolt and a pair of lateral necks;

said control lever surrounds said support with at least two flaps directed toward said support; and

said control lever is rotatably mounted on said pair of lateral necks through recesses in said flaps.

5,588,707

FOLDING SEAT

James Bolsworth, Sterling Heights, and Robert E. Adamson, Jr., Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1995, Ser. No. 557,265
Int. Cl.[6] B60N *2/02*
U.S. Cl. 297—378.12 **2 Claims**

1. A vehicle seat comprising:

a front leg having first and second ends, the front leg being pivotally attached to the vehicle floor generally adjacent the front leg first end;

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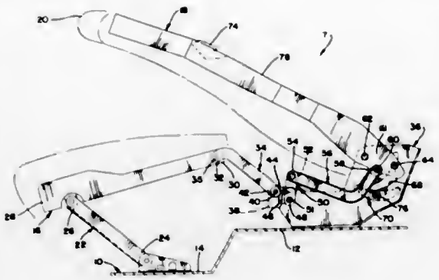


a seat cushion with front and rear ends, the seat cushion front end being pivotally connected to the front leg second end;

a rear leg with a second end pivotally connected adjacent the seat cushion rear end, the rear leg having a first end pivotally connected with respect to the vehicle floor, the rear leg first end having a first gear attached thereto;

a sector link having first and second ends, the sector link second end pivotally connected with respect to the vehicle floor, the sector link second end having a second gear attached thereto, the second gear being meshed with the first gear;

an intermediate link with a rear end and a front end, the intermediate link front end being pivotally connected to the sector link adjacent the sector link first end; and

a seat back pivotally connected with respect to the vehicle floor and pivotally connected to the rear end of the intermediate link, whereby when folding the seat back forwardly, the seat cushion forward end is displaced forwardly to a position more adjacent to the vehicle floor.

5,588,708

ARRANGEMENT IN A FURNITURE MEMBER, ESPECIALLY A LEG SUPPORTING MEMBER FOR A CHAIR

Arne O. Rykken, Øystese, 5610 Øystese, Norway, and Søren Meinert, Bagergade 37, 5700 Svendborg, Denmark

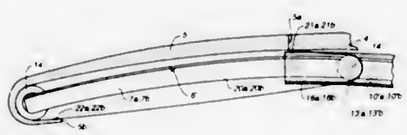
PCT No. PCT/NO93/00154, § 371 Date Apr. 19, 1995, § 102(e) Date Apr. 19, 1995, PCT Pub. No. WO94/08494, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 18, 1993, Ser. No. 416,866

Claims priority, application Norway, Oct. 19, 1992, 924044

Int. Cl.[6] A47C *7/50*

U.S. Cl. 297—423.2 **23 Claims**



1. An arrangement for supporting a calf for a chair comprising a chair seat part and a back part, the calf-supporting arrangement comprising: a chiefly non-stiffened web-shaped portion which is supported by a moveable supporting/carrying device and which runs in a loop via at least one curved guide device attached to the moveable supporting/carrying device so that the web-shaped portion is continuously moveable between a shielded, inactive retracted position underneath the chair seat part and an active protruded calf-supporting position, chiefly flush with the chair seat part, the moveable supporting/carrying device further including a sheet-shaped supporting/carrying carriage arranged to support said chiefly non-stiffened web-shaped portion.

5,588,709

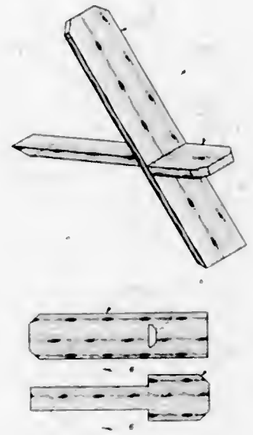
KNOCKDOWN SEAT

William J. Lewallen, Sr., 12026 Co. Rd L., Napoleon, Ohio 43545

Filed Jun. 26, 1995, Ser. No. 494,953

Int. Cl.[6] A47C *4/03*

U.S. Cl. 297—440.19 **2 Claims**



1. A knockdown seat comprising: a back panel of substantially elongated planar configuration shaped so as to define a receiving aperture directed therethrough, the receiving aperture separating the back panel into a back rest extending in a first direction from the receiving aperture, and a front support leg extending in an opposite second direction from the receiving aperture; a seat panel shaped so as to define a rear support leg which extends through the receiving aperture of the back panel, and a seat bottom which resides adjacent to a front face of the back panel, wherein the rear support leg projects through the receiving aperture and extends from a rear face of the back panel and where the bank panel is shaped so as to define longitudinal edges extending in a substantially spaced and parallel orientation along a length of the back panel, with the front support leg of the back panel being shaped so as to define a beveled engaging and extending substantially orthogonally between the longitudinal edges of the back panel and where the back rest is further shaped so as to define an upper edge extending substantially othrogonally with respect to the longitudinal edges of the back panel, and angled corner edges extending at an Oblique angle between the upper edge and the respective longitudinal edges, wherein the angled corner edges permit shoulder blades of an individual to project beyond the back panel and where the seat bottom of the seat panel is shaped so as to define spaced and parallel longitudinal edges oriented a first transverse distance apart, the seat bottom further including a forward edge extending substantially orthogonally relative to the longitudinal edges of the seat bottom, with angled corners edges extending at an oblique angle between opposed ends of the forward edge and the respective longitudinal edges of the seat bottom and where the rear support leg of the seat panel further includes substantially spaced and parallel longitudinal edges which are spaced a second transverse distance apart, wherein the first transverse distance is substantially greater than the second transverse distance so as to define a reduced transverse dimension of the rear support leg relative to the seat bottom and where the seat panel includes abutment edges extending substantially orthogonally between the longitudinal edges of the seat bottom and the longitudinal edges of the rear support leg, the abutment edges engaging the front face of the back panel when the rear support leg of the seat panel is positioned through the receiving aperture of the back panel and where the rear support leg is shaped so as to define a beveled engaging end extending substantially orthogonally between the longitudinal edges thereof and where the receiving aperture is shaped so as to accommodate corresponding shape of the rear support leg and where the rear support leg of the seat panel is shaped so as to define a planar upper surface oriented in a substantially spaced and parallel orientation to a planar lower surface, the support leg of the seat panel being further shaped so as to define orthogonal longitudinal edges extending substantially orthogonally in a spaced and parallel orientation from the upper surface, and beveled longitudinal edges of planar configuration extending at an oblique angle between the respective orthogonal edges and the lower surface increasing the rear support leg's strength.

5,588,710

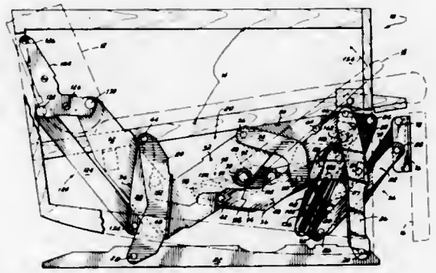
WALL AVOIDING RECLINING FURNITURE MECHANISM

Glenn N. Wlecek, Shelbyville, Ky., assignor to L&P Property Management Company, Chicago, Ill.

Filed Feb. 28, 1995, Ser. No. 395,577

Int. Cl.[6] A47C *15/00*

U.S. Cl. 297—463.1 **8 Claims**



1. A linkage mechanism for an item of reclining furniture having a unitary seat and armrest frame structure, a backrest frame structure and a footrest frame structure each being movable with respect to each other between fully upright and fully reclined positions, said mechanism comprising:

a stationary base mounting member;

front and rear drive links pivotally connected at spaced locations to said base mounting member;

a seat link having upper front and rear sections and a lower section therebetween;

a seat supporting linkage assembly connected generally between said front and rear drive links and between said base mounting member and said seat link, said seat supporting linkage assembly including a seat actuating linkage assembly pivotally connected at one end to an upper portion of said front drive link and at another end to an upper portion of said rear drive link;

a footrest linkage assembly connected to said front end of said seat link and movable between extended and retracted positions relative to said seat link; and,

footrest actuating linkage including:

a) a handle link having front and rear ends and being pivotal about an axis disposed between said handle link front and rear ends;

b) a footrest drive link pivotally connected between said handle link rear end and said footrest linkage assembly;

c) a ratio connecting link pivotally connected between said handle link front end and said front drive link; and,

d) a torsion bar rigidly connected for rotation with said handle link about said axis, said torsion bar extending transversely to said linkage mechanism and adapted to connect with a handle link of a second linkage mechanism.

5,588,711

SIDE DUMPING CONTAINER

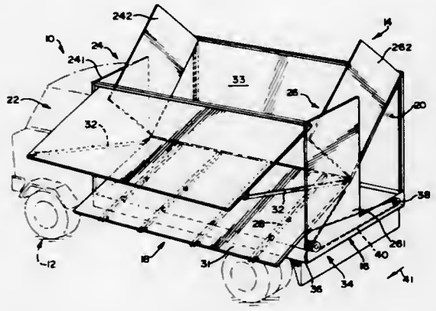
Daniel J. Hall, Voorbaai, South Africa, assignor to John Daniel Containers (Proprietary) Limited, George, South Africa

Filed Mar. 16, 1995, Ser. No. 404,875

Claims priority, application South Africa, Mar. 16, 1994, 94/1833; Jun. 3, 1994, 94/3913

Int. Cl.[6] B65D *88/54*

U.S. Cl. 298—18 **16 Claims**



1. A container for use in the transportation of goods, which container is mountable on a load carrying vehicle and includes

a floor;

a pair of opposed side walls each of which is supported for displacement about a pivotal axis adjacent its upper edge and one of which is hingedly connected adjacent its lower edge to the floor;

displacement means for displacing the floor and at least said one side wall between a rest position in which goods can be contained within the container and a discharge position in which goods contained within the container can be discharged therefrom; and

friction reducing floor support means supporting the floor to facilitate displacement thereof between its rest and discharge positions, the friction reducing floor support means including a plurality of longitudinally spaced apart transversely extending tracks and longitudinally spaced apart sets of rollers which run on the tracks.

5,588,712

DEVICE AND METHOD FOR LOWERING A DUMP TRUCK BED ACCORDING TO THE TRANSMISSION STATE OF THE VEHICLE

Louie J. Brooks, 1142 Littlevine Church Rd., Villa Rica, Ga. 30180

Division of Ser. No. 100,681, Aug. 2, 1993, Pat. No. 5,452,942. This application Jun. 21, 1995, Ser. No. 492,754

Int. Cl.[6] B60P *1/16*

U.S. Cl. 298—22 C **7 Claims**

1. An improved dump vehicle, comprising;

a dump bed whereby material is carried in and dumped from said dump bed;

means for operating said dump bed;

a powered wheel drive with a transmission;

said transmission comprising pneumatic manual transmission control means for selectively shifting said transmission in reverse, neutral and various forward gears for corresponding selective operation of said powered wheel drive and:

means responsive to said pneumatic manual transmission control means for automatically lowering said dump bed when said transmission is shifted to or above a predetermined gear wherein said predetermined gear may be set before the vehicle begins travel.

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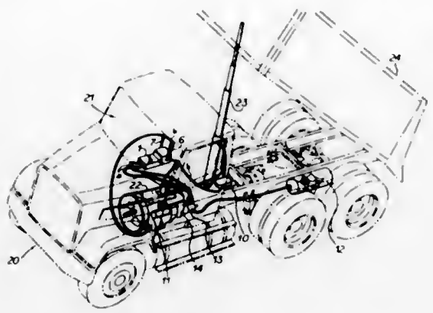


5,588,713

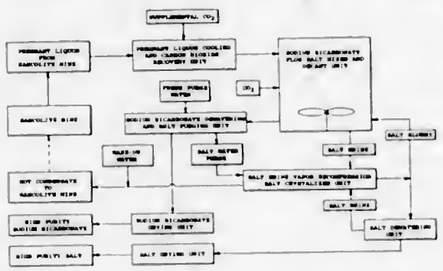
PROCESS FOR MAKING SODIUM BICARBONATE FROM NAHCOLITE-RICH SOLUTIONS

Tom D. Stevenson, 2413 Pelham Dr., Houston, Tex. 77019

Filed Dec. 20, 1995, Ser. No. 575,883

Int. Cl.[6] E21B *43/28;* **E21C** *41/20;* **C01D** *7/10*

U.S. Cl. 299—5 **12 Claims**



1. A process for making sodium bicarbonate from Nahcolite-rich solutions by use of solubility suppression with addition of salt, comprising the steps of:

(a) pumping hot water into an underground Nahcolite ($NaHCO_3$)-rich formation to dissolve the Nahcolite ($NaHCO_3$);

(b) returning the dissolved Nahcolite ($NaHCO_3$) to the surface of the formation in the form of a saturated brine pregnant liquor solution;

(c) de-gassing the pregnant liquor solution under pressure in a pressure controlled system;

(d) mixing the de-gassed pregnant liquor solution with a salt slurry containing an amount of NaCl sufficient to saturate the de-gassed pregnant liquor solution and reducing the temperature of the de-gassed pregnant liquor solution sufficient to saturate the de-gassed pregnant liquor solution with NaCl and to force precipitation of Nahcolite ($NaHCO_3$) out of the de-gassed pregnant liquor solution;

(e) while mixing the de-gassed pregnant liquor solution with said salt slurry, injecting carbon dioxide (CO_2) into the mixture to facilitate precipitation and conversion of any sodium carbonate (Na_2CO_3) present into sodium bicarbonate ($NaHCO_3$);

(f) dewatering and filtering the sodium bicarbonate ($NaHCO_3$) to form a sodium bicarbonate ($NaHCO_3$) filter cake, and washing the filter cake with fresh water to remove NaCl, sodium carbonate (Na_2CO_3), and other impurities as a salt-rich brine filtrate; and

(g) drying the washed sodium bicarbonate ($NaHCO_3$) filter cake to produce a high grade of natural sodium bicarbonate ($NaHCO_3$).

5,588,714

METHOD FOR MANUFACTURING BRUSHES

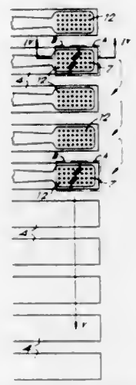
Leonel P. Boucherie, Ambachtenstraat, Belgium, assignor to Firma G. B. Boucherie, naamloze vennootschap, Belgium

Filed May 5, 1995, Ser. No. 436,008

Claims priority, application Belgium, May 9, 1994, 09400479

Int. Cl.[6] A46D *3/04*

U.S. Cl. 300—21 **9 Claims**



1. In a method for manufacturing brushes in which brush bodies having fiber receiving openings arranged in a specific hole pattern are supplied to a filling station having at least two filling tools whereat bundles of fibers are inserted by the filling tools in the openings, the improvement comprising the steps of:

successively presenting each brush body to the at least two filling tools such that each filling tool fills only a portion of the entire hole pattern of each brush body presented to it for filling, with the portions filled by the filling tools being different but complimentary to each other so that the filling tools collectively in succeeding steps insert fibers into the entire hole pattern of each brush body supplied to the filling station;

each filling tool filling a different portion of the hole pattern of each successive brush body presented to it for filling.

5,588,715

NON-ROTATING WHEEL COVER ASSEMBLY

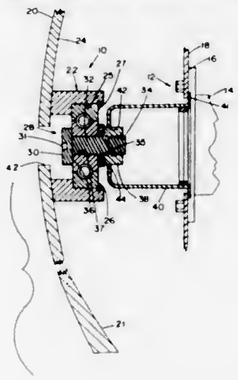
Charles D. Harlen, 2006 Wooddale Dr., Huntsville, Ala. 35801

Filed Jun. 20, 1994, Ser. No. 263,372

Int. Cl.[6] B60B *7/20*

U.S. Cl. 301—37.25 **10 Claims**

1. A non-rotatable wheel cover assembly including mounting



means for mounting a wheel cover directly to a wheel support assembly of a vehicle, said wheel cover being a single member in the form of a disc and having inner and outer surfaces, and said wheel supporting assembly including a housing enclosing an axle, said axle having a distal threaded end, said wheel supporting assembly disposed for supporting the wheels of said vehicle, said mounting means comprising:

a cup-like member secured to said wheel support assembly, said cup-like member having a top closure portion provided with an axial opening having a seal therein:

first attaching means including a member mounted on said inner surface of said wheel cover and extending inwardly therefrom;

second attaching means including a member having a first end disposed for secured relation with said wheel cover supporting member of said first attaching means and a second end disposed for secured relation with said distal end of said axle, said first attaching means disposed for secured relation with said member of said second attachment means for non-rotational support of said wheel cover, said member of said second attaching means including a first end and a second end, said first end disposed for extending through said seal of said cup-like member for secured relation with said wheel cover supporting member of said first attachment means and said second end disposed for secured relation with said distal end of said axle; and

wheel cover position retention means disposed on said wheel cover for retaining the orientation of said wheel cover in a stationary, non-rotating position.

5,588,716

METHOD AND DEVICE FOR ELECTRONICALLY CONTROLLING THE BRAKE SYSTEM OF A VEHICLE

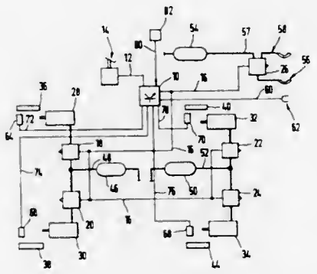
Werner Stumpe, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 25, 1995, Ser. No. 548,025

Claims priority, application Germany, Oct. 26, 1994, 44 38 252.9

Int. Cl.[6] B60T *8/18;13/66*

U.S. Cl. 303—7 **14 Claims**



1. Method for braking a towing vehicle and a trailer towed by said towing vehicle, said method comprising:

generating a brake signal (e) for said towing vehicle in response to a driver's action,

generating a brake signal (eTr) for said trailer in dependence on said brake signal (e) for said towing vehicle;

generating a prescribed deceleration (Zdes) for said towing vehicle in dependence on said brake signal (e) for said towing vehicle,

generating an actual deceleration (Zact) for the whole vehicle (towing vehicle and trailer),

generating a correction value K for the brake signal (eTr) for the trailer during braking in dependence on said prescribed deceleration (Zdes) and the actual deceleration (Zact),

correcting the brake signal (eTr) for the trailer during braking by the correction value K, whereby said actual deceleration (Zact) substantially equals to said prescribed deceleration (Zdes),

applying brake pressure at the towing vehicle and the trailer based on the respective brake signals.

5,588,717

VALVE UTILIZING SHAPE MEMORY ALLOYS AND AN ANTI-LOCK BRAKE SYSTEM WITH THE VALVE

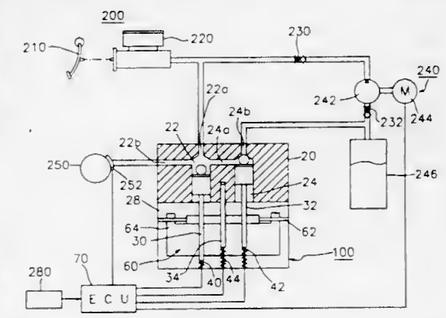
Sang K. Kim; PahngRoc Oh, and Hong J. Lee, all of Seoul, Rep. of Korea, assignors to Daewoo Electronic Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 13, 1995, Ser. No. 501,935

Claims priority, application Rep. of Korea, Jul. 15, 1994, 94-17255

Int. Cl.[6] F16K *31/66*

U.S. Cl. 303—84.2 **10 Claims**



1. A valve comprising:

an electronic control unit for generating a first control current and a second control current;

a housing including a bore formed in an upper portion thereof having an inlet for introducing a fluid from a fluid supply and an outlet for discharging the fluid, and a compartment formed in a lower portion thereof;

a valve spool for closing the inlet at a first position of said valve spool and for opening the inlet at a second position of said valve spool;

biasing means for applying a biasing force to said valve spool to maintain said valve spool at the first position of said valve spool;

a shape memory alloy member for moving said valve spool to the second position of said valve spool while overcoming the biasing force of said biasing means when the first control current is supplied from said electronic control unit;

holding means for maintaining said valve spool at the second position of said valve spool when said valve spool moves to the second position of said valve spool by said shape memory alloy member; and

releasing means for releasing a state of said valve spool which is maintained at the second position of said valve spool by means of said holding means when the second control current is supplied from said electronic control unit, so that said valve spool is moved to the first position of said valve spool by said biasing means,

wherein said biasing means is a spring installed between a bottom surface of said compartment and a lower end of said valve spool,

said shape memory alloy member is installed between said valve spool and the bottom surface of said compartment is electrically connected to said electronic control unit, and has a shape of a linear wire, and

said holding means comprises:

a shaft transversely-installed within said compartment;

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a plate pivotally mounted about said shaft;

a plate spring installed between an inner sidewall of said compartment and a lower surface of said plate for elastically supporting said plate; and

a ratchet formed at a lower end of said valve spool for being locked to said plate when said valve spool is positioned at the second position of said valve spool.

5,588,718

VEHICLE HYDRAULIC BRAKE SYSTEM OPERATING WITH POWER ASSISTANCE

Hermann Winner, and Alain Gaillard, both of Karlsruhe, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

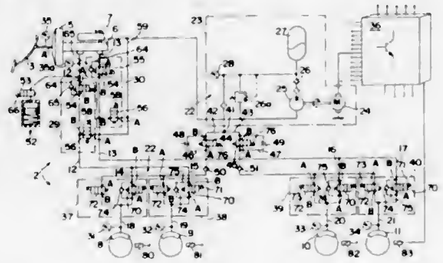
PCT No. PCT/DE94/01287, § 371 Date Jun. 16, 1995, § 102(e) Date Jun. 16, 1995, PCT Pub. No. WO95/14595, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 2, 1994, Ser. No. 454,331

Claims priority, application Germany, Nov. 27, 1993, 43 40 467.7

Int. Cl.[6] B60T *8/32;8/48;8/60;13/12*

U.S. Cl. 303—113.1 **17 Claims**



1. A vehicle hydraulic brake system which comprises a twin circuit emergency brake pressure source which can be put into operation by a pedal, wheel brakes which can be supplied from the emergency brake pressure source, emergency brake main conduits laid as a twin circuit and extending from the emergency brake pressure source to the wheel brakes and with a power-assisted brake device which can be controlled electrically by means of the pedal, said brake device has at least one fluid pump which can be supplied from a reservoir, a power reservoir which can be charged by said at least one pump, and at least one controllable first valve arrangement (**29**, **30**) per brake circuit, for the selection of a brake pressure source, between the emergency brake pressure source and wheel brakes and said brake device has at least one electrically controllable second valve arrangement (**37**, **38**, **39**, **40**, **37***a*, **37***b*, **37***c*), for brake pressure setting, a required brake pressure value generator (**35**) which can be controlled by means of the pedal, and a control unit (**36**) connected to the required brake pressure value generator (**35**), said control unit (**36**) controls the at least one second valve arrangement (**37**, **38**, **39**, **40**, **37***a*, **37***b*, **37***c* in order to generate brake pressures from the energy of the power source and to change these brake pressures, wherein the at least one first valve arrangement (**29**, **30**) for selecting the brake pressure sources (**6**, **23**) is arranged to open the associated emergency brake main conduits (**12**, **13**) to a return conduit (**59**) which leads to the reservoir (**7**), wherein the at least one second valve arrangement (**37**, **38**, **39**, **40**, **37***a*, **37***b*, **37***c*) is connected to the emergency brake main conduits (**12**, **13**) and at least one of the wheel brakes (**8**, **9**, **10**, **11**) to set brake pressures while relaying a pressure medium from the power source (**23**) and is arranged in such a way that said at least one second valve arrangement connects the emergency brake main conduits (**12**, **13**) to the wheel brakes (**8**, **9**, **10**, **11**) when no electrical current is applied to the at least one electromagnet (**71**, **73**, **83**) and separates the wheel brakes (**8**, **9**, **10**, **11**) from the power source (**23**) and, in power-assisted brake operation, connects the wheel brakes (**8**, **9**, **10**, **11**) to the power source (**23**) for the purpose of a brake pressure increase and to the emergency brake main conduits (**12**, **13**), which can be opened to the reservoir (**7**), for the purpose of brake pressure reduction.

5,588,719

ANTI-WHEEL-LOCK BRAKING SYSTEM FOR A MOTOR VEHICLE

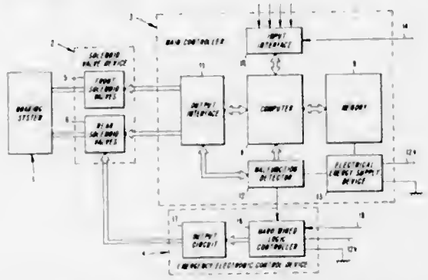
Francois Bailleux, Val D'Albian, France, assignor to Automobiles Peugeot, Paris, and Automobiles Citroen, Neuilly Sur Seine, both of France

Filed Aug. 30, 1994, Ser. No. 297,884

Claims priority, application France, Sep. 2, 1993, 93 10466

Int. Cl.[6] B60T *8/88*

U.S. Cl. 303—122.04 **14 Claims**



1. An anti-lock braking system for a motor vehicle having front and rear wheels, comprising:

a main electronic controller including (i) wheel speed inputs and (ii) means to detect a failure of the main electronic controller and to generate a signal independently of wheel speed inputs when the main electronic controller fails; and

an emergency electronic controller independent of the main electronic controller and independent of wheel speed inputs, having means to directly decrease braking of the rear wheels when the means to detect a failure generates a signal that a failure of the main electronic controller is detected.

5,588,720

CIRCUIT ARRANGEMENT FOR A BRAKE SYSTEM WITH ANTI-LOCK SYSTEM AND/OR TRACTION CONTROL

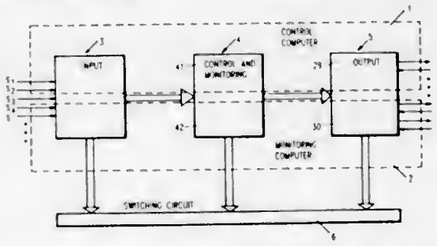
Klaus-Peter Mattern, Beilstein, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 29, 1995, Ser. No. 580,891

Claims priority, application Germany, Jan. 5, 1995, 195 00 188.5

Int. Cl.[6] B60T *8/32;* **B60K** *28/16*

U.S. Cl. 303—122.08 **15 Claims**



1. A circuit arrangement for a brake system with anti-lock system and/or traction control with input circuits for conditioning

sensor signals, which represent rotational behavior of individual vehicle wheels, with output circuits for outputting control signals, with control circuits for processing the conditioned sensor signals and for generating control signals, with monitoring circuits to which the conditioned sensor signals can be fed, for processing a model algorithm which constitutes a simplified simulation of the control algorithm, with comparator circuits for comparing the signals of the control circuits with the corresponding signals of the monitoring circuits and with circuits for switching off the control in the event of a fault, wherein both the control circuits (**16**) and the monitoring circuits (**17**) comprise watchdog circuits (**23**, **24**) for continuously processing a watchdog algorithm which tests the functioning of the control and monitoring circuits (**16**, **17**) and comparator circuits (**25**, **26**) for comparing the results of the processed watchdog algorithms, and wherein the output circuits (**21**, **22**) only enable the control if both the control signals output by the control circuits (**16**) correspond to the corresponding signals of the monitoring circuits (**17**) and the results of the watchdog algorithms respectively processed in the watchdog circuits (**23**, **24**) correspond.

5,588,721

VIBRATION ANALYSIS OF THE ROTATING WHEEL FOR CONTROLLING ANTI-LOCK BRAKING OPERATION

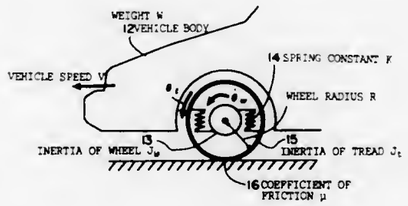
Katsuhiro Asano; Masaru Sugai; Hiroyuki Yamaguchi, and Takaji Umeno, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Aug. 28, 1995, Ser. No. 519,965

Claims priority, application Japan, Aug. 29, 1994, 6-203510; Jun. 5, 1995, 7-138306

Int. Cl.[6] B60T *8/66*

U.S. Cl. 303—163 **23 Claims**



1. An anti-lock brake controlling apparatus comprising:

detecting means for detecting a vibration characteristic of a wheel which is rotating at a certain speed; and

controlling means for controlling a mean braking force acting on the wheel on the basis of the detected vibration characteristic such that a slip ratio between a tire and a road surface is not larger than a value at which a coefficient of friction between the tire and the road surface substantially reaches a peak value.

5,588,722

BRAKING SYSTEM HAVING MECHANISM FOR CONTROLLING RESISTANCE OF FLUID FLOW FROM PUMP INTO LOW-PRESSURE BRAKE CYLINDER DEPENDING UPON PRESSURE DIFFERENCE BETWEEN LOW-PRESSURE AND HIGH-PRESSURE BRAKE CYLINDERS

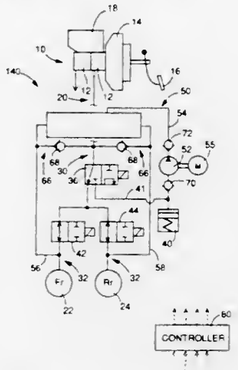
Noboru Noguchi, Nagoya, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 26, 1995, Ser. No. 548,894

Claims priority, application Japan, Nov. 11, 1994, 6-277416

Int. Cl.[6] B60T *13/00*

U.S. Cl. 303—186 **9 Claims**



1. A braking system comprising:

a reservoir for storing a working fluid;

a pump which is operated to pressurize the working fluid received from the reservoir so as to intermittently deliver the pressurized fluid;

two brake cylinders to which the pressurized fluid delivered from the pump is distributed;

an electrically operated pressure control device connected to the reservoir, pump and two brake cylinders;

a controller for electrically controlling the electrically operated pressure control device to electrically control the pressures in the two brake cylinders; and

a flow resistance control mechanism provided in a pump passage connecting said pump and said two brake cylinders, said flow resistance control mechanism controlling flows of the working fluid during operation of said pump such that when a difference between pressures of the fluid in said two brake cylinders is relatively large, a resistance of flow of the fluid from the pump toward a low-pressure cylinder of said two brake cylinders is increased relative to a resistance of flow of the fluid from the pump toward a high-pressure cylinder of said two brake cylinders.

5,588,723

ADJUSTABLE KITCHEN APPLIANCE GARAGE

B. Jerry Sivin, Parsons Pine Products, Inc P.O.Box 670, Ashland, Oreg. 97520

Filed Feb. 13, 1995, Ser. No. 387,256

Int. Cl.[6] A47B *45/00*

U.S. Cl. 312—205 **16 Claims**

1. A variable height storage device for placement between a lower surface, an upper surface and a rear surface, comprising:

a) a left wall having a left wall front portion with a left wall front portion lip extending therefrom;

b) a right wall having a right wall front portion with a right wall front portion lip extending therefrom, the right wall being displaced a distance from the left wall and defining a storage space therebetween;

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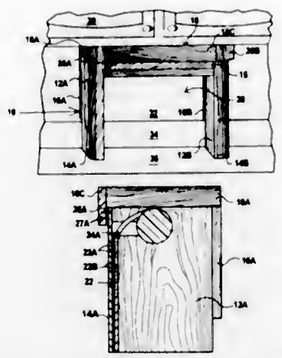
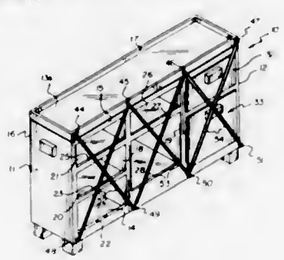


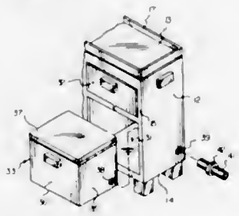
c) a cross member connecting the left wall to the right wall and having a left end and a right end, the left end of the cross member being attached to the left wall front portion lip and the right end of the cross member being attached to the right wall front portion lip;

d) a retractable door disposed within the left wall front portion lip and the right wall front portion lip capable of moving between a closed position covering the storage space and an open position; and

e) a shroud removably mounted to the cross member and joining the variable height storage device to the upper surface so that the space between the variable height storage device and the upper surface is aesthetically enclosed while providing support for the mounted variable height storage device.

5,588,724
CAMP KITCHEN CABINET
David Emery, 108A Taylortown Rd., Boonton, N.J. 07005
Filed Apr. 10, 1995, Ser. No. 419,440
Int. Cl.[6] A47B *77/08*
U.S. Cl. 312—236 **4 Claims**





1. A camp kitchen cabinet comprising,

a housing having a first side wall spaced from a second side wall, a top wall spaced from a bottom wall, and a front wall spaced from a rear wall, and

at least one intermediate wall extending between the top wall and the bottom wall, and

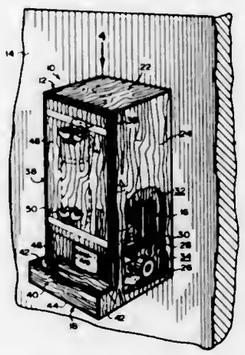
a plurality of shelf plates, wherein one of said plurality of shelf plates extends from the at least one intermediate wall to the first side wall to define a storage support member, and a further shelf plate of said plurality of shelf plates extends from a further intermediate wall to the second side wall to define a first storage cavity between the further shelf plate and the top wall, and a second storage cavity between the further shelf plate and the bottom wall, with a storage member slideably received within the first storage cavity, and

a cooler container slideably received within the second storage cavity, and

retaining means extending from the cooler container and through the cabinet second side wall for selectively securing the cooler container within the second storage cavity when the cooler container is complementarily received within the second storage cavity, and

a top wall plate, wherein the top wall plate is arranged to include a hinge member hingedly securing the top wall plate to the rear wall, and the top wall plate is coextensive with the top wall in a first position and is substantially coplanar with the top wall in a second position, a continuous flange integrally secured to the top wall plate, the continuous flange extending about a periphery of the top wall plate, at least one hook member secured to the cabinet front wall, at least one further hook member secured to the continuous flange, and at least one resilient cord member, the resilient cord member having a cord hook at each end thereof for securement to each said hook to extend over the first storage cavity and the second storage cavity.

5,588,725
DECORATIVE MULTI-PURPOSE EMERGENCY CABINET
Carmella L. Frank, 112 Overlook Dr., East Islip, N.Y. 11730
Filed Aug. 30, 1995, Ser. No. 521,523
Int. Cl.[6] A47B *67/02*
U.S. Cl. 312—245 **1 Claim**



1. A decorative emergency cabinet mounted upon a vertical flat member in an upright position for holding various emergency type articles in one place, so that during an emergency situation the articles can be retrieved quickly for immediate use comprising:

a) a flat, horizontal top panel, a pair of flat, vertical side panels, and a rear panel forming an open front compartment;

b) a shelf within said compartment about a third of the distance up from said bottom panel dividing said compartment into upper and lower chambers;

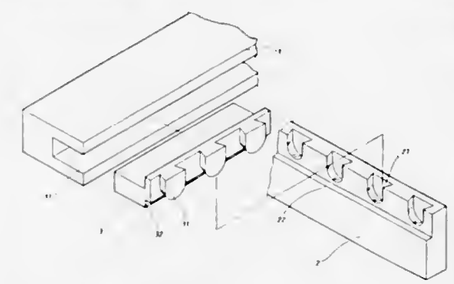
c) a hinge along one free edge of one side panel between said top panel and said shelf, and a door connected to said hinge to open and close the upper chamber;

d) planter means comprising said bottom panel extending from said rear panel a sufficient distance beyond said door when closed so as to form a planter in front of said lower chamber and forward of said door when closed for holding flowering house plants therein, said side panels being L-shaped and a vertical front panel to enclose the sides of said planter;

e) means separating said planter from said lower chamber comprising a narrow partition on the bottom panel extending between the side panels and being of the same height as said planter for gaining access to said lower chamber;

f) said door including a transparent pane with a decorative lattice thereon.

5,588,726
CABINET WALL BOARD ASSEMBLY
Shang-Ming Lee, 5F-1, No. 3, Lane 179, Yen-Ping S. Rd., Taipei, Taiwan
Filed Oct. 24, 1995, Ser. No. 547,203
Int. Cl.[6] A47B *47/00*
U.S. Cl. 312—263 **1 Claim**



1. A cabinet wall board assembly comprising:

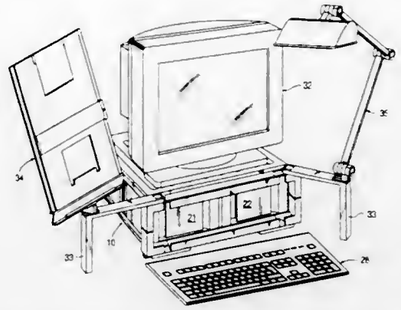
a horizontal board formed with a connecting channel;

multiple adjoining members each having a first end for inserting into the connecting channel and a second end disposed with multiple equally spaced tenons, each tenon having an arch bottom, an end face and a root portion, the tenon being tapered from the end face to the root portion, each said adjoining member further having an engaging face under the tenons; and

a wall board having an upper end disposed with multiple dovetail mortises corresponding to the tenons of the adjoining members and having a supporting face on the inner side of the dovetail mortises for engaging with the engaging faces of the adjoining members.

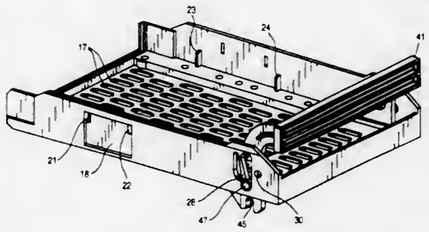
5,588,727
DESKTOP ORGANIZER FOR AN OFFICE WORKSTATION
Amos D'Agaro, Udine; Adriano Marino, Novara, and Andrea Venturini, Udine, all of Italy, assignors to Exponent Italia S.r.l., Udine, Italy
Filed Apr. 5, 1995, Ser. No. 417,114
Claims priority, application Italy, Nov. 3, 1994, PN940039 U
Int. Cl.[6] A47B *97/00*
U.S. Cl. 312—283 **20 Claims**

1. A desktop organizer for organizing an office workstation that includes at least a monitor of a computer, said desktop organizer comprising: a container in the form of a box having a top, a bottom, a front end, a rear end and first and second opposite sides, the front end and said first side of the container being open to the interior of the container, and the container including a rigid member having a substantially planar upper surface defining the top of the container, whereby a computer monitor can be supported on top of the container; a first runner disposed inside the container and extending in a first direction between the front end and the rear end of the container; a second runner disposed inside the container and



extending in a section direction between the first and second sides of the container, said second direction being orthogonal to said first direction; and a drawer housed within said container and supported by said first and second runners so as to be pullable out of and pushable into the container through both the front end of the container and said first side of the container.

5,588,728
PORTABLE DISK DRIVE CARRIER AND CHASSIS
Robert A. Eldridge, Beaverton; Ed J. Unrein, Lake Oswego; David L. Brown, Milwaukee, and Scott L. Noble, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Continuation of Ser. No. 346,039, Nov. 29, 1994. This application Dec. 29, 1995, Ser. No. 580,489
Int. Cl.[6] A47B *95/02*; **H01R** *13/62*
U.S. Cl. 312—332.1 **14 Claims**



1. A disk drive carrier adapted to be housed in a disk drive chassis comprising:

an integrated carrying handle and locking mechanism suitable for handling said disk drive carrier and for providing a one-hand activated locking mechanism for locking and unlocking said disk drive carrier in the disk drive chassis;

wherein said carrying handle includes:

first and second swing arms each having a first end, said swing arms for pivotally mounting said carrying handle to said drive bay;

a single cross member having opposing ends, said single cross member being coupled to said first ends of said first and second swing arms proximal to said opposing ends of said single cross member; wherein said first and second swing arms have second ends, said second ends each having locking post engagement grooves;

first and second axially aligned cylindrical attachment posts protruding from said first and second swing arms, respectively; and

a drive bay for receiving and holding a hard disk drive, said drive bay including first and second opposing side walls, each side wall having a front end and defining an aperture, said aperture aligned proximal to said front end for receiving attachment posts associated with the carrying handle; wherein

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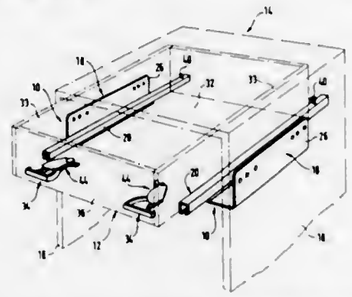
said apertures each define a flexible locking member which allows for the pivotal locking of said attachment posts.

5,588,729
HARDWARE DEVICE FOR THE VERTICAL ADJUSTMENT OF DRAWERS

Horst Berger, Bielefeld, Germany, assignor to MEPLA-Werke Lautenschläger GmbH & Co. KG, Germany

Filed Sep. 14, 1995, Ser. No. 527,872
Claims priority, application Germany, Sep. 15, 1994, 44 32 820.6
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—334.4 **8 Claims**



1. A hardware device for the vertically adjustable mounting of a drawer mounted by means of drawer slides in a furniture carcase interior, in which the drawer slides have each one guide rail to be fastened in the carcase interior and one runner rail provided on the drawer, said runner rail being provided with roller means,

the hardware device comprising a flat adjuster of substantially sector-shaped outline for mounting for rotation about a vertical axis towards an end of a drawer slide adjacent a front end of a furniture carcase, the adjuster being shaped as a wedge increasing in thickness from an approximately radial defining edge in a direction of rotation towards a rear edge of the adjuster, and wherein

the adjuster is rotatable about a vertical axis and is insertable between a runner rail of a drawer slide and a bottom face of a drawer bottom to thereby effect a vertical adjustment of the drawer bottom with respect to the runner rail

wherein a lever arm acting as a handle extends outwardly from an outer circumference of the adjuster, running radially to the axis of rotation, and

the adjuster being oriented such that the substantially radially running edge of the adjuster in an initial position lies directly beside the runner rail, running in a lengthwise direction of the runner rail

wherein the adjuster is journaled in a separately formed mounting device attached to the drawer-front end of the runner rail.

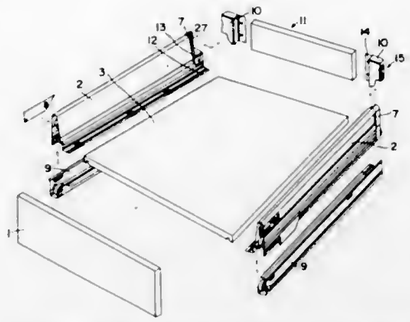
5,588,730
FITTING

Erich Röck, Höchst, and Edgar Huber, Hard, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jan. 13, 1995, Ser. No. 372,328
Claims priority, application Austria, Jan. 17, 1994, A 77/94
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—348.2 **14 Claims**

1. A fitting for use in attaching a rear wall of a drawer to a side part of the drawer, said fitting comprising:

a holding part including a flange to extend in a direction to be parallel to a rear surface of the rear wall and to be attached thereto, and a housing portion integral with said flange and



extending laterally therefrom in a direction such that when said flange is attached to the rear surface of the rear wall said housing portion is positioned at a location of a respective lateral end of the rear wall to form a lateral extension thereof;

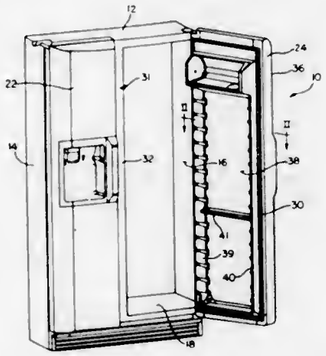
said housing portion including a closure wall extending parallel to said flange in a direction to form a closed lateral continuation of a front surface of the rear wall, a member connecting said flange to one lateral end of said closure wall, a side wall integral with an opposite lateral end of said closure wall and defining therewith a corner, said side wall extending perpendicular to said closure wall in a direction to be rearward of the drawer, and locating holes formed in said side wall; and

a supporting part to be attached to the side part of the drawer, said supporting part having extending laterally therefrom fixing lugs to engage in said locating holes to thereby attach said holding part to said supporting part with said housing portion positioned laterally between the side part and the rear wall of the drawer.

5,588,731
REFRIGERATOR DOOR CONSTRUCTION

Christopher G. Schmidt, Evansville; Michael H. Fisher, Princeton, both of Ind.; Amilton F. de Almeida, and Edson T. Tani, both of Sao Paulo, Brazil, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 17, 1995, Ser. No. 503,358
Int. Cl.[6] A47B *96/04;81/00*
U.S. Cl. 312—405 **9 Claims**



1. In the construction of a refrigerator door, the door having an external panel and an inside liner with an insulation material applied there between, the improvement comprising:

said external panel having a front wall and side walls defining a C-shaped cross section with the side walls defining the perim-

eter of the panel and being generally perpendicular to the front wall and terminating in edge portions to define an open face of the panel;

a border trim for applying around the perimeter of said panel, said border trim having a connection means for connecting to said edge portions, and said border trim further having a flange portion extending inwardly from said side walls;

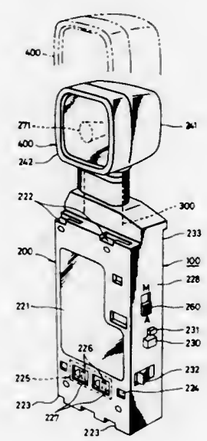
a gasket having a portion disposed between the liner and the border trim and lying adjacent the flange; and

wherein the insulation material structurally unitizes the panel, border trim, liner-and gasket and presses said portion of the gasket against the flange to prevent the escape of the insulation material between the border trim and the liner.

5,588,732
VIDEO LIGHTING APPARATUS AND ELECTRODE APPARATUS THEREFOR

Yuu Sasaki, Chiba; Junichi Iwasawa, and Masahiro Yamada, both of Kanagawa, all of Japan, assignors to Sony Corporation, Japan, and Asahi Research Corp., both of Japan

Continuation of Ser. No. 881,799, May 12, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 269,616
Claims priority, application Japan, May 17, 1991, 3-113512
Int. Cl.[6] G03B *15/021*
U.S. Cl. 362—10 **9 Claims**



1. A lighting apparatus attachable to a video camera comprising:

a lighting apparatus body attachable to said video camera;

illumination means associated with said lighting apparatus body for providing illumination, said illumination means being arranged so as to moveably project from a first position close to said lighting apparatus body to a second position distance from said lighting apparatus body by a predetermined distance;

spring-biasing means associated with said lighting apparatus body for spring-biasing said illumination means in said second position;

engaging means associated with said lighting apparatus body for engaging said illumination means at said first position;

a mode switch means associated with said lighting apparatus body for selecting an automatic mode and a manual mode;

releasing means associated with said lighting apparatus body for releasing said engaging means and for switching said illumination means on in accordance with said movement of said illumination means, from said first position to said second position, when said releasing means releases said engaging means at the time of said manual mode; and

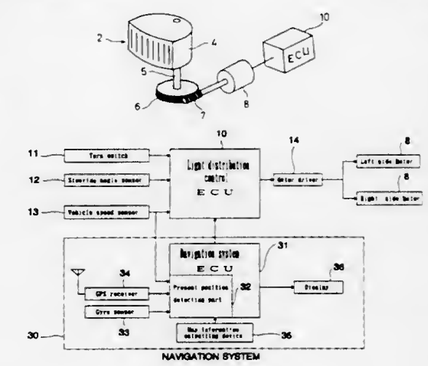
a current detecting circuit means associated with said lighting apparatus body for detecting current of an internal circuit of said video camera at the time of said automatic mode;

wherein said illumination means lights according to the detection of said current detecting circuit means.

5,588,733
HEAD LAMP DEVICE FOR VEHICLE

Shinichirou Gotou, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 472,225
Claims priority, application Japan, Jan. 17, 1995, 7-020898
Int. Cl.[6] B60Q *1/12*
U.S. Cl. 362—37 **17 Claims**



1. A head lamp device for a vehicle in which a lighting region in front of the vehicle can be adjusted in rightward and leftward directions,

said device comprises:

direction indicating signal outputting means for detecting an operation of a winker device and outputting a direction indicating signal;

steering signal outputting means for detecting a steering angle of a steering device and outputting a steering angle signal;

map information outputting means for outputting map information including road data;

present position detecting means for detecting a present position of a proper vehicle on the map; and

control means for inputting said direction indicating signal, steering angle signal, map information and information of the present position and adjusting the lighting region of said head lamp based thereon, and

said control means selects a first control mode when said direction indicating signal is inputted; a second control mode for adjusting the lighting region in response to said steering angle when said first mode is not selected and said present position is not found on the road data of said map information or a steering angle of said steering angle exceeds a predetermined range; and a third control mode for adjusting the lighting region in compliance with an expectation of a forward road shape in a traveling direction of the vehicle in reference to said map information and the present position when said first and second control modes are not selected.

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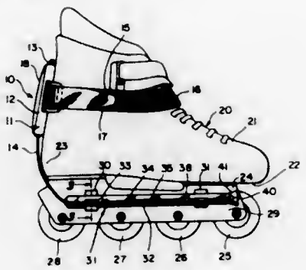
5,588,734

SIDE LIGHT FOR IN-LINE ROLLER SKATE

John A. Talamo, 131 Seafare, Laguna Niguel, Calif. 92677, and Angela C. Hoy, 222 Prospect Ave., Newport Beach, Calif. 92663

Filed Jul. 6, 1995, Ser. No. 498,575
Int. Cl.[6] A63C *17/26*
U.S. Cl. 362—61 **7 Claims**



1. A side light for use in combination with an in-line skate having a foot-receiving portion, a frame beneath the foot-receiving portion, and a plurality of wheels supported by the frame, said side light comprising:

a power unit having a housing defining an interior cavity, a rear lens, and an on/off switch;

an attachment strap for securing said housing to the foot-receiving portion of the in-line skate;

battery power means within said interior cavity coupled to said on/off switch;

at least one rear light element supported by said housing and coupled to said power unit for illuminating said rear lens;

an elongated tube defining a passage therein and formed of a light-transmissive material;

a plurality of side light elements supported within said passage and coupled to said battery power means; and

attachment means for attaching said elongated tube to the frame of the in-line skate.

5,588,735

STICK

Noboru Harada, 2-25-11, Chuo, Edogawa-ku, Tokyo, Japan

Filed May 18, 1995, Ser. No. 443,670
Claims priority, application Japan, Jun. 14, 1994, 6-154334
Int. Cl.[6] A45B *3/04*
U.S. Cl. 362—102 **2 Claims**

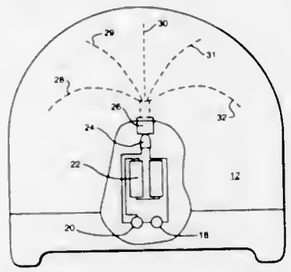
1. A stick comprising a bar having a handle portion at an upper end of said bar, a power source battery contained in said bar, an illuminating light source connected to said power source battery for illuminating an area close to feet of a user having said stick, a warning source connected to said power source battery for drawing a third person's attention, a transparent cover disposed on a front surface of said illuminating light source, and a control circuit for supplying a drive signal to each of said sources by opening/closing a switch of a feed line from said power source battery, wherein a drive signal is output from said control circuit on the basis of an AND logic of an output signal from each of a brightness sensor for detecting a brightness range and a sensible sensor for detecting a user's body temperature.

5,588,736

SELF-LIGHTED SAFETY HELMET

Raymond E. Shea, Sr., 1030 Stafford St., Rochdale, Mass. 01542

Filed Oct. 27, 1995, Ser. No. 549,326
Int. Cl.[6] F21L *15/14*
U.S. Cl. 362—106 **19 Claims**



1. A self-lighted safety helmet, comprising:

a helmet body with a phosphorescent outer shell member; and

a radiation source providing radiation to said outer shell capable of inducing phosphorescence of said outer shell, to project luminescence from the helmet to increase helmet visibility.

5,588,737

MODULAR RECESSED LIGHTING SYSTEM

Raymond J. Kusmer, Yorba Linda, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.

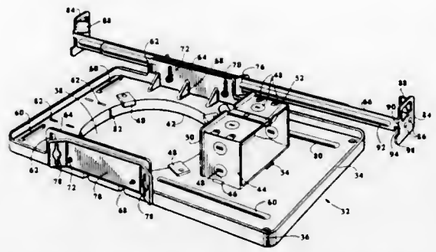
Filed Nov. 10, 1994, Ser. No. 339,193
Int. Cl.[6] F21S *1/02*
U.S. Cl. 362—148 **16 Claims**

1. A modular recessed light fixture, comprising:

a plaster frame defining a major plane;

a junction box mounted on said plaster frame, said junction box defining a first face;

means for selectively attaching a junction face plate at said first face of said junction box, said means for selectively attaching comprises a recess in said plaster frame, said recess lying in said major plane; and



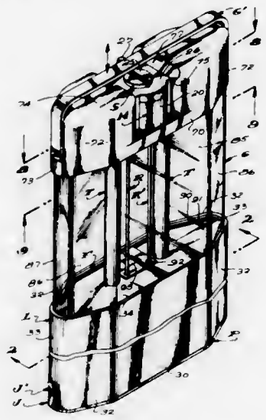
a junction face plate selectively attachable at said first face by said means for selectively attaching, a tab on said junction face plate for selective insertion into said recess in said major plane of said plaster frame, said junction face plate including means for adapting said junction box to an installation configuration wherein said installation configuration comprises a component selected from the group comprising: a transformer, a thermal protector, a ballast and a conduit connector.

5,588,738

LANTERN

Rudy B. Meoli, 1660 Orchard Dr., Placentia, Calif. 92670

Filed Jul. 10, 1995, Ser. No. 500,050
Int. Cl.[6] F21L *7/00*
U.S. Cl. 362—184 **11 Claims**



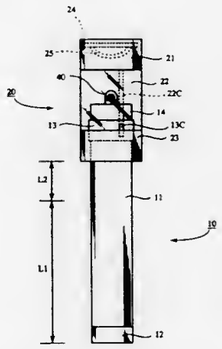
1. An elongate vertically extending lantern including upper and lower housing sections and a central elongate vertically extending tubular globe with spaced apart oppositely disposed transparent front and rear walls, spaced apart oppositely disposed transparent side walls and upper and lower ends sealingly engaging the upper and lower housing sections, a plurality of spaced apart vertically extending fluorescent tubes positioned within the globe and having upper and lower ends that are within the upper and lower housing sections, a battery power supply within the lower housing section, electric circuit means connecting the battery power supply with the lower ends of the tubes, a manually operable multi-position switch connected with the power supply by the electric circuit means and having a normal open position and a first closed position, electric conductors connecting the first closed position of the switch to the upper ends of the tubes, a flat vertically and laterally extending, forwardly disposed, reflector panel positioned within the rear portion of the lantern and selectively shiftable between a down stored position within the lower housing section to an up operating position within the globe, rearward of the tubes and forward of the rear wall and of the globe.

5,588,739

FLASHLIGHT WITH SIGNALING LAMP

Masashi Nakao, Tokyo, Japan, assignor to Kyoyu Corporation, Tokyo, Japan

PCT No. PCT/JP94/00529, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/27085, PCT Pub. Date Nov. 24, 1994
PCT Filed Mar. 30, 1994, Ser. No. 356,208
Claims priority, application Japan, May 11, 1993, 5-133003
Int. Cl.[6] F21L *11/00*
U.S. Cl. 362—205 **6 Claims**



1. A flashlight with signaling lamp comprising:

a main body (**10**) comprising a tubular casing (**11**) having a space sufficient to accommodate a battery (**31, 32**), a housing (**14**) for attaching a lamp bulb (**40**), and a rotary switch (**13, 130**) provided between the tubular casing and the housing; and

a slide body (**20**) comprising an illuminating tubular portion (**21**) and a signaling tubular portion (**22, 220**), said illuminating tubular portion accommodating a transparent plate (**24**) which is fitted to an upper end of the illuminating tubular portion and a reflection plate positioned (**25**) for irradiating light through the transparent plate and said signaling tubular portion having an upper end being connected to a lower end of the illuminating tubular portion and comprised of a transparent material,

wherein said rotary switch includes a fixed portion (**13A, 132, 136, 139**) fixed on the tubular casing and a rotary portion, associated with the slide body, (**13B, 131, 133, 134, 135, 137**) rotating with a central axis (X) in a length direction of the main body being as axis of rotation and constitutes a power supply path for delivering a power from the battery accommodated within the tubular casing to the lamp bulb, said power supply path being ON/OFF controlled by rotating the rotary portion, and

wherein the slide body is a slidably attached to an outside of the main body so that the transparent plate is directed toward the housing and so that said slide body can slide along said central axis and can rotate with said central axis as axis of rotation, said slide body including engagement means (**22C, 220C**) for transmitting a rotational movement of the slide body to the rotary portion of the rotary switch.

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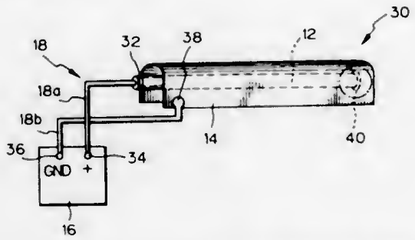
5,588,740

BACKLIGHT DEVICE FOR A LIQUID CRYSTAL DISPLAY FACILITATING THE REPLACEMENT OF A LAMP THEREOF

Koji Kasuga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 28, 1994, Ser. No. 331,192
Claims priority, application Japan, Oct. 29, 1993, 5-292506
Int. Cl.[6] F21V *23/00*
U.S. Cl. 362—221 **10 Claims**



1. A backlight device for a liquid crystal display comprising:

a lamp having a first electrode and a second electrode at opposite ends thereof; and

a lamp reflector made of a conductive material for reflecting light issuing from said lamp, said lamp reflector being electrically connected to a ground terminal of a power source at one end and mating with said first electrode of said lamp at the other end, wherein

said second electrode is electrically connected to a positive terminal of said power source, and wherein

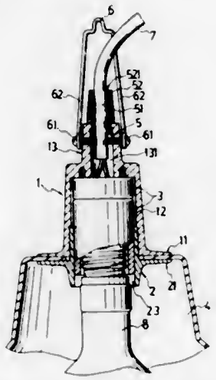
said other end of said lamp reflector is squeezed inward in a funnel configuration for mating with said first electrode of said lamp.

5,588,741

LAMP HOLDER ASSEMBLY

Angus Huang, 7F, No. 15, Alley 17, Lane 79, Sec. 2, Kee-Lung Rd., Taipei, Taiwan

Filed Oct. 13, 1995, Ser. No. 542,502
Int. Cl.[6] F21V *31/02*
U.S. Cl. 362—267 **3 Claims**



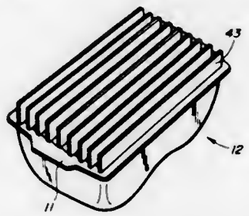
1. A lamp holder assembly comprising an upper shell, a hanger connected to said upper shell, an electric wire, a wire holder mounted on said upper shell to hold said electric wire, a ceramic socket fixed to the inside of said upper shell and connected to said electric wire to hold a lamp bulb, a bottom shell mounted around said ceramic socket and fixed to said upper shell, and a lampshade retained between said upper shell and said bottom shell around the lamp bulb, wherein: said upper shell is made of hollow, cap-like structure, comprising an outward flange around the periphery of a bottom end thereof, an inner thread, a cylindrical top section, which holds said wire holder, two screw holes on said cylindrical top section at two opposite sides, and two screws respectively threaded into said screw holes and stopped against said electric wire at two opposite sides to secure said hanger in place and to hold down said electric wire; said bottom shell is made of cylindrical shape fitting said upper shell, having an outer thread threaded into the inner thread of said upper shell, an outward flange attached to the outward flange of said upper shell to hold a top side of said lampshade between, and a center through hole, which receives said ceramic socket.

5,588,742

INTERNALLY ILLUMINATED SIGN

Gregory J. Subisak, Gahanna, Ohio, and Douglas S. Hammond, Vicksburg, Mich., assignors to Holophone Corporation, Newark, Ohio

Division of Ser. No. 961,262, Oct. 15, 1992, Pat. No. 5,355,291, which is a continuation-in-part of Ser. No. 646,917, Jan. 28, 1991, Pat. No. 5,188,453. This application Jun. 29, 1994, Ser. No. 267,970
Int. Cl.[6] F21V *11/00*
U.S. Cl. 362—291 **8 Claims**



1. In a sign having at least two spatially separated faces adapted to be illuminated from light radiated into the interior of said sign between said spatially separated faces, said at least two spatially separated faces including at least one translucent face, the improvement comprising:

a luminaire mountable on the periphery of said sign having means for providing light in the region between said spatially separated faces, means for eliminating bright spots on said at least one translucent face adjacent said luminaire, said elimination means comprising a plurality of spatially separated painted louvers, and means for disbursing light in the interior of said sign between said spatially separated faces to uniformly illuminate at least one translucent face.

5,588,743

LUMINAIRES

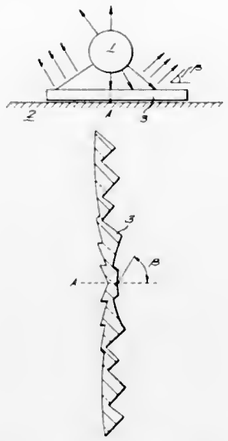
Kevin Mayo, and Mark Wiltshire, both of Nr Banbury, United Kingdom, assignors to Menvier (Electronic Engineers) Ltd., Banbury, United Kingdom

Filed Oct. 17, 1994, Ser. No. 324,761
Claims priority, application United Kingdom, Nov. 17, 1993, 9323663
Int. Cl.[6] F21V *7/12*
U.S. Cl. 362—299 **8 Claims**

1. A luminaire comprising:

a light source; and

a light redirecting element disposed behind the light source to cause light impinging upon the redirecting element from the light source to be redirected back past the light source at a chosen angle, the redirecting element being a Fresnel type



lens having a first plurality of inclined faces at a lens surface nearest the light source and a second plurality of inclined faces at a lens surface furthest from the light source.

5,588,744

GALLERY RING ASSEMBLIES FOR CHANDELIERS

John M. Lucas, Cadyville; Arnold Schonbek, and Georg Bayer, both of Plattsburgh, all of N.Y., assignors to Schoenbek Worldwide Lighting, Inc., Plattsburgh, N.Y.

Filed Jan. 6, 1995, Ser. No. 369,384
Int. Cl.[6] F21S *1/06*
U.S. Cl. 362—405 **22 Claims**

1. A gallery ring assembly for a decorative lighting chandelier, comprising:

a plurality of decorative members, each having a mounting hole; and

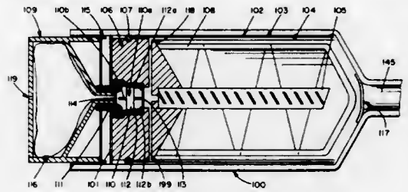
a gallery ring having a plurality of locations for mounting said decorative members, each of said mounting locations including a mounting hole, each of said decorative members being secured to said gallery ring by a mounting screw that passes through The mounting hole in said decorative member and the mounting hole in said gallery ring, each of said decorative members and each of the mounting locations on said gallery ring having interlocking elements to prevent rotation of said decorative member about said mounting screw relative to said gallery ring.

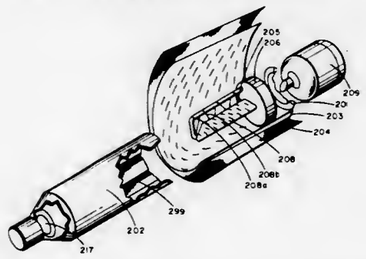
5,588,745

METHODS AND APPARATUS FOR MIXING BONE CEMENT COMPONENTS USING AN EVACUATED MIXING CHAMBER

Kazuna Tanaka, Cos Cob; Jeffrey Kapec, Westport, both of Conn., and Allan B. Chochinov, New York, N.Y., assignors to Howmedica

Filed Sep. 2, 1994, Ser. No. 300,045
Int. Cl.[6] B01F *13/06;15/02*
U.S. Cl. 366—130 **73 Claims**





37. A mixing device for mixing a powdered and a liquid component comprising:

(a) a first evacuated container containing a powdered component mass;

(b) a second container containing a liquid component;

(c) means for connecting said first and second containers, after the evacuation of said first container, allowing said liquid component to be drawn into said first container, and

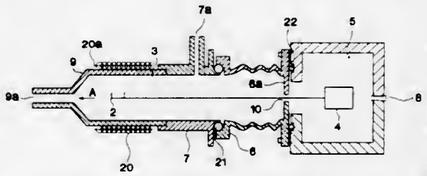
(d) means for introducing said liquid component into said first container in a manner which substantially wets the powdered component mass stored therein by wetting said powdered component mass from outside and from within the stored powdered component mass.

5,588,746

APPARATUS FOR THERMAL ANALYSIS

Masao Minobe, Tsuchiura; Noboru Shiraga, Tsukuba, and Nobutaka Nakamura, Gotenba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, and Seiko Instruments, Inc., Tokyo , both of Japan

Filed Jul. 19, 1994, Ser. No. 277,046
Claims priority, application Japan, Jul. 22, 1993, 5-181639
Int. Cl.[6] G01N *25/00;5/00;25/20*
U.S. Cl. 374—10 **8 Claims**



1. An apparatus for thermal analysis comprising a sample chamber having a portion for a sample to be analyzed at which the

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sample is placed and a signal detection chamber provided with a signal detection member which detects a physical change or a chemical change in the sample during the thermal analysis, wherein

the signal detection chamber comprises an inlet port through which a purging gas is supplied into the signal detection chamber,

a partition member having a passage through which the purging gas passes is provided between the sample chamber and the signal detection chamber so as to separate the sample chamber from the signal detection chamber, and

the sample chamber is provided with an inlet port through which an atmosphere gas is supplied into the sample chamber so that the sample is subjected to a predetermined atmosphere comprising the atmosphere gas, and the sample chamber is provided with an outlet port through which the atmosphere gas and the purging gas are withdrawn to the outside of the apparatus, wherein the partition member is so constructed that a ratio of a cross sectional area of the purging gas passage (A) to a cross sectional area of the partition member (B) which is adjacent to the sample chamber on one side thereof and also to the signal detection chamber on the other side thereof is not larger than ½ and not smaller than 1/100.

5,588,747

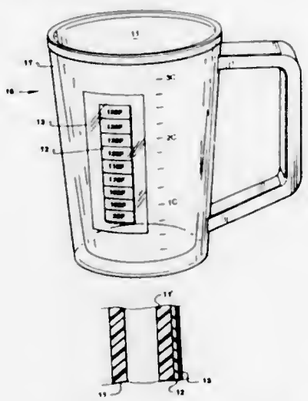
MEASURING CUP WITH EXTERNALLY-MOUNTED LIQUID CRYSTAL THERMOMETER

Terry D. Blevins, 5808 Tree Mountain Pkwy., Stone Mountain, Ga. 30083

Continuation-in-part of Ser. No. 252,588, Jun. 1, 1994, abandoned. This application Jan. 5, 1995, Ser. No. 369,678

Int. Cl.[6] G01K *1/14;13/12*

U.S. Cl. 374—157 **2 Claims**



1. A device adapted for use in mixing proper quantities of ingredients at a desired temperature, comprising:

(a) an insulated measuring cup having a structure which defines an upper-rim and interior and exterior walls joined thereto, the interior wall defining a receptacle, contiguous portions of the interior and exterior walls located downwardly of the upper rim being spaced apart from each other and separated by an air gap; and

(b) a liquid crystal thermometer fixedly attached to the exterior wall of the cup so that the thermometer is thermally isolated from the receptacle.

5,588,748

PROBE COVER FOR USE IN TYMPANIC THERMOMETER

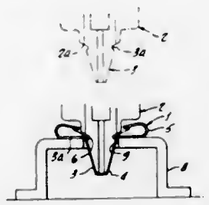
Toshiyuki Nomura; Yuiji Tsujioka, and Naohiro Osuga, all of Miyanohigashi-machi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Continuation of Ser. No. 501,696, Jul. 12, 1995, abandoned, which is a continuation of Ser. No. 121,361, Sep. 14, 1993, abandoned. This application Jun. 28, 1996, Ser. No. 668,517

Claims priority, application Japan, Sep. 19, 1992, 4-275543

Int. Cl.[6] G01K *1/08*

U.S. Cl. 374—158 **17 Claims**



17. A probe cover for use with a thermometer having an elongate probe, the probe defining a receiving groove at its base, the probe cover comprising:

a flexible retaining member having at least two end edge portions and a substantially centrally located opening, the opening being dimensioned to admit the elongate probe and to engage the receiving groove; and

a film member secured to the retaining member at the end edge portions, the film member covering the opening;

the film member contacting the probe and being urged through the opening of the retaining member by the probe when the probe cover is urged over the probe, thereby drawing the end edge portions of the retaining member inwardly toward the opening.

5,588,749

MULTIFUNCTIONAL BAG

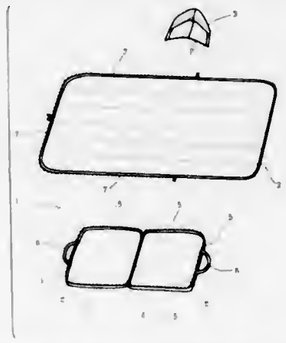
Hiromi Ishikawa, Tokyo, Japan, assignor to Office Ishikawa Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 412,884

Claims priority, application Japan, Apr. 6, 1994, 6-004704

Int. Cl.[6] B65D *30/10;33/10;* **A41D** *3/08;15/04*

U.S. Cl. 383—4 **10 Claims**



1. A multifunctional bag device comprising:

a bag including first and second bag members, each of said first and second bag members including a hinge edge along a portion of a periphery thereof and fastener edges having fasteners thereon along other portions of the periphery, said first and second bag members being hinged together at their respective hinge edges and being detachably attached along their respective fastener edges by said fasteners, so that said bag is closable into a bag-shape for containing items therein by folding said first and second bag members toward one another about said hinge edges and fastening together the respective fastener edges of said first and second bag members with said fasteners, and so that said bag is openable to form a pair of seats by detaching the respective fastener edges from one another and unfolding said first and second bag members from one another along said hinge edges;

an elongate foldable sheet removably insertable in said bag when said bag is closed into said bag-shape and said sheet is folded, said sheet having fasteners provided along peripheral edges thereof for enabling said sheet to be formed into a sleeping bag by being folded along a longitudinal center and having said fasteners along the peripheral edges thereof fastened together so that one longitudinal end of the sleeping bag is closed by the fasteners, a first longitudinal side of the sleeping bag formed by folding along the longitudinal center of said sheet is closed and at least a portion of a second longitudinal side of said sleeping bag, opposite said first longitudinal side of said sleeping bag, is closed by the fasteners, said fasteners being unfastenable to allow said sheet to be unfolded for use as a lap robe or a body portion of a hooded poncho; and

a hood removably insertable in said bag when said bag is closed into said bag-shape, said hood having a fastener provided along a bottom edge thereof for detachable attachment to a portion of one of the fasteners provided along the peripheral edges of said sheet, such that said hood and said sheet, when fastened together by the respective fasteners, form the hooded poncho.

5,588,750

BALL RETAINER WITH INNER SEAL FOR LINEAR GUIDE APPARATUS

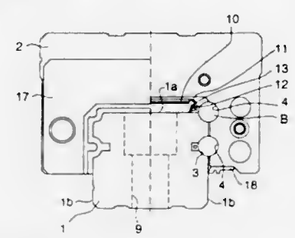
Nobuyuki Osawa, and Masayuki Katahira, both of Gunma, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jul. 20, 1995, Ser. No. 504,579

Claims priority, application Japan, Jul. 20, 1994, 6-168184

Int. Cl.[6] F16C *29/06*

U.S. Cl. 384—15 **8 Claims**



1. A linear guide apparatus comprising:

a guide rail including in a side surface thereof a first ball rolling groove extending in an axial direction of the guide rail;

a slider including in an inside surface thereof a second ball rolling groove formed in opposition to the first ball rolling groove, the slider hanging over the guide rail so that the slider is movable in the axial direction with respect to the guide rail;

a plurality of balls loaded into the mutually opposing ball rolling grooves; and

a ball retainer being mounted into the slider and including an inner seal disposed in a space formed within the slider and the guide rail, wherein the inner seal has side edges comprising:

a pair of ball holding parts for holding the balls loaded into the second ball rolling groove to thereby prevent the balls from falling away from the second ball rolling groove when the slider is removed from the guide rail; and

a pair of thin-plate shaped inner seal parts respectively extending along and fixed integrally to the ball holding parts, the inner seal parts including end portions slidingly contactable with an upper surface of the guide rail.

5,588,751

ROLLING BEARING AND METHOD OF FABRICATING THE SAME

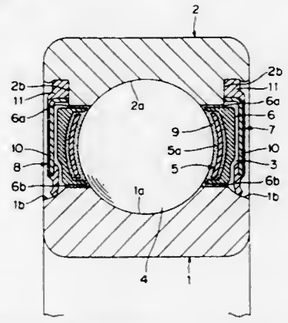
Ryuji Nakata, Osaka, and Hiroshi Komiya, Kashihara, both of Japan, assignors to Koyo Seiko Co., Ltd., Japan

Filed Mar. 13, 1996, Ser. No. 614,473

Claims priority, application Japan, Mar. 13, 1995, 7-053010; Mar. 5, 1996, 8-047743

Int. Cl.[6] F16C *33/66*

U.S. Cl. 384—463 **16 Claims**



1. A rolling bearing comprising:

a pair of races for defining an annular region therebetween;

a plurality of rolling elements arranged in the region and rolling on each of the races;

a cage arranged in the region and having pockets for holding the respective rolling elements; and

a solid lubricating composition which is composed of a mixture of a resin and a lubricating component, with which the region is filled;

a film including a lubricating component being formed between the pocket and the rolling element in a state where the solid lubricating composition is prevented from being interposed therebetween.

5,588,752

BEARING AND JOURNAL ASSEMBLY

Mark W. K. Fetty, Hopewell, Va., assignor to Brenco, Incorporated, Petersburg, Va.

Filed Mar. 4, 1996, Ser. No. 610,304

Int. Cl.[6] F16C *33/78*

U.S. Cl. 384—477 **12 Claims**

1. In combination with a rail car axle having a coaxial, cylindrical journal portion at and extending inwardly from a free end of the axle and a coaxial, cylindrical shoulder portion spaced from the free end and having a diameter larger than the diameter of the journal, and a fillet merging the cylindrical journal surface into the shoulder, an improved bearing assembly fitted onto the journal and retained thereon by an end cap mounted on said free end to permit relative rotation between the axle and an element supported by the bearing, said bearing assembly comprising, an inboard bearing cone and an outboard bearing cone mounted on said journal in axially spaced relation to one another, each said cone defining frustoconical inner raceway and each having an inner diameter providing an interference fit with said journal, a cylindrical spacer element mounted on said journal between said bearing cones and

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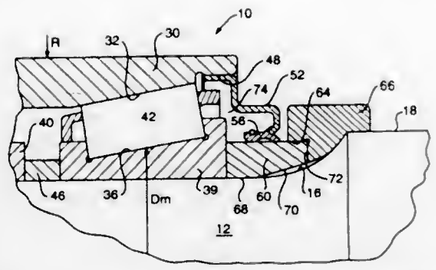


maintaining said bearing cones in said axially spaced relation, a bearing cup defining a pair of inwardly directed frustoconical outer raceways located one in radially outwardly spaced relation to each of said inner raceways, rolling elements located between the outer and inner raceways, a backing ring mounted on said shoulder, said backing ring having a counterbore formed therein providing an interference fit with said cylindrical shoulder surface and a contoured surface complementary to and engaging said fillet surface over a portion of the axial extent of said fillet in a manner to radially and axially fix the backing ring on the axle, a second counterbore formed in said backing ring providing an annular, substantially planar axially outwardly directed abutment surface at an axial location spaced between the maximum and minimum diameter portions of said fillet, a first seal wear ring mounted on said journal and having a first end surface engaging said backing ring abutment surface and a second end surface engaging said inboard bearing cone, a second seal wear ring mounted in contact with said outboard bearing cone and said end cap, and a pair of annular sealing elements interposed one between each end of said bearing cup and each said seal wear ring forming a lubricant barrier at each end of the bearing, said first seal wear ring having an inner generally cylindrical surface providing an interference fit with said cylindrical journal surface over a portion of the axial length of said first seal wear ring and having an outer cylindrical surface providing an interference fit with said second cylindrical bore in said backing ring, said outer cylindrical surface of said first seal wear ring having a diameter at least equal to the mean diameter of said inner raceways.

5,588,753

DISK DRIVE MOTOR WITH LABYRINTH SEAL

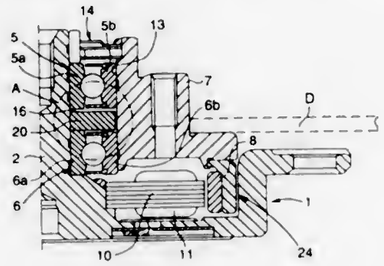
Shinji Kinoshita, and Mitsuru Ide, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Aug. 15, 1995, Ser. No. 518,486

Claims priority, application Japan, Aug. 17, 1994, 6-193446

Int. Cl.[6] F16C *33/80*

U.S. Cl. 384—488 **8 Claims**



1. A disk drive motor comprising:

a center shaft;

ball bearings, inner rings thereof being fixedly fitted with the center shaft while interposing a predetermined distance therebetween;

a hub supported so as to be rotatable about the center shaft with outer rings of the ball bearings being fixed to an inner hole thereof;

a drive magnet secured to the hub;

a stator core arranged so as to confront the drive magnet;

first and second seals arranged along respective paths in the disk drive motor, said paths leading to a space outside the motor, at least one of said paths communicating the ball bearings with the space outside the motor;

an annular spacer fixedly fitted with the center shaft between the inner rings of the pair of ball bearings, wherein an outer circumferential surface of the spacer confronts an inner circumferential surface of the inner hole of the hub while interposing a small gap therebetween, so that a labyrinth seal mechanism is formed.

5,588,754

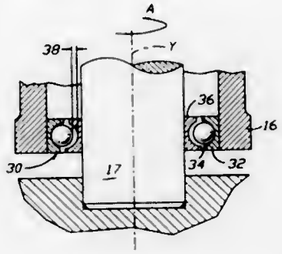
BACKUP BEARINGS FOR EXTREME SPEED TOUCH DOWN APPLICATIONS

Robin M. Miller, Ellington, Conn., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Dec. 29, 1995, Ser. No. 581,080

Int. Cl.[6] F16C *19/10;32/04*

U.S. Cl. 384—609 **18 Claims**



1. A backup bearing for providing backup to magnetic bearings comprising:

an outer race disposed about an axis, and mounted for rotational movement with respect thereto;

an inner race spaced from the outer race and disposed about the axis, the inner race being substantially stationary with respect to the axis;

a plurality of rolling elements each having a central axis with each element being spaced from the inner race and disposed between the inner and outer race for rotational movement therebetween;

wherein rotation of the outer race causes corresponding rotation of the plurality of rolling elements such that upon contact of the rolling elements with the inner race, the speed differential between the rotating rolling elements and the substantially stationary inner race causes each rolling element contacting the inner race to accelerate about its central axis.

5,588,755

UNWINDING APPARATUS FOR UNWINDING TAPE-LIKE SHEET MEMBER

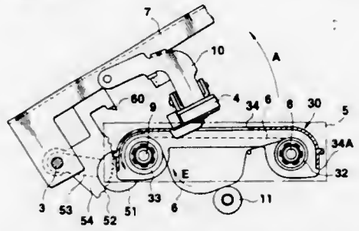
Wataru Nimura, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1995, Ser. No. 425,421

Claims priority, application Japan, Apr. 30, 1994, 6-113606

Int. Cl.[6] B41J *33/14*

U.S. Cl. 400—234 **15 Claims**



1. An unwinding apparatus for use with a cassette including upper and lower opening portions at upper and lower portions thereof and a tape-like sheet member therein, said unwinding apparatus comprising:

an apparatus main body having a cassette inlet and outlet opening at a side portion thereof such that the cassette 13 detachable with the apparatus main body through the cassette inlet and outlet opening of the apparatus main body, the apparatus main body including a winding shaft and an unwinding shaft such that the tape-like sheet member is bridged between the winding shaft and the unwinding shaft when inserted in the apparatus main body;

a head member inserted into the cassette through the upper opening portion formed on the cassette for pressing down the sheet member to position below the lower opening portion;

a head attaching member attached with the head member and movably disposed on the apparatus main body in an upward and downward direction so as to bring the head member into contact with the sheet member and to separate the head member from the sheet member;

an abutting member disposed on the apparatus main body at a position opposed to the head member so as to abut the head member through the sheet member; and

unwinding means for rotating the unwinding shaft to move the sheet member in an unwinding direction in connection with the movement of the head attaching member when the head attaching member moves in a direction to separate the head member from the sheet member, so as to move the sheet member in a tensioning direction.

5,588,756

INK RIBBON CARTRIDGE AND METHOD OF INSTALLING SAME

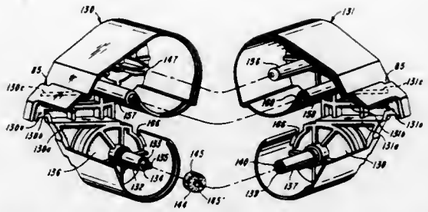
Paul H. Hamisch, Jr., Franklin, and John D. Mistyurik, Troy, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 137,660, Oct. 15, 1993, abandoned. This application Aug. 31, 1995, Ser. No. 522,184

Int. Cl.[6] B41J *33/52*

U.S. Cl. 400—234 **6 Claims**

1. An ink ribbon cartridge for use in a printer having a platen and a print head cooperable with the platen for printing on a web of record members, the ink ribbon cartridge comprising: a cartridge housing, an ink ribbon supply roll having a tubular core onto which an ink ribbon has been wound, the core having an inner surface, a shaft within the cartridge housing for mounting the ink ribbon supply roll, means within the cartridge housing for mounting a roll of spent ink ribbon, the shaft including first and second shaft members, the first shaft member including a first terminal end portion terminating at a first surface, the first terminal end portion



having an axial hole, the second shaft member including a second terminal end portion having a second surface and terminating at an axial projection, the projection being received in the hole, the first and second surfaces being in opposed relationship to each other and being spaced apart, a tubular brake member having a frictional outer surface received on the projection between the spaced apart first and second surfaces, the frictional outer surface of the brake member being in frictional contact with the inner surface of the core.

5,588,757

RECORDING APPARATUS WITH DETACHABLE MAGNETIC SENSOR

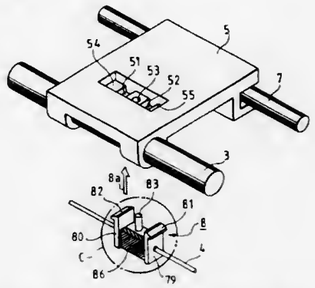
Yasuhiro Unosawa, Tokyo; Shinji Kanemitsu; Makoto Kashimura, both of Yokohama; Makoto Takemura, Tokyo; Shoji Kikuchi, Yokohama; Shinya Matsui, Tokyo; Toshiyuki Onishi, Yokohama; Tetsuhiro Nitta, Yokohama; Masaru Sato, Yokohama, and Hisashi Morioka, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,520, Oct. 27, 1993, abandoned. This application Mar. 20, 1996, Ser. No. 618,784

Claims priority, application Japan, Oct. 28, 1992, 4-313011; Nov. 10, 1992, 4-324863; Aug. 19, 1993, 5-226567

Int. Cl.[6] B41J *19/00*

U.S. Cl. 400—279 **17 Claims**



1. A recording apparatus having a magnetic linear encoder, comprising:

a carriage mounted with a recording head movable in recording scan directions;

a magnetized scale;

a detection unit, including a magnetic linear encoder and a bearing member, for detecting magnetized information magnetized to said scale, said scale being inserted in said bearing member so that said detection unit is movable along said scale, said detection unit including said magnetic linear encoder in combination with said scale; and

connection means for snap-locking said detection unit, in which said scale is received in said bearing member, to said carriage, said connection means including clicks formed on one of said detection unit and said carriage, and click engaging portions formed on the other one of said detection unit and said carriage, said click engaging portions engaging with said clicks with the result that said detection unit is fixed to said carriage.

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5,588,758

SHEET FEEDING APPARATUS

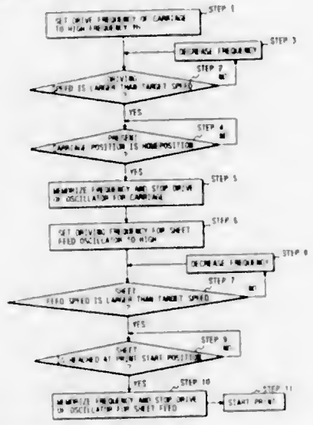
Shinji Yamamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 80,710, Jun. 24, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,863

Claims priority, application Japan, Jun. 25, 1993, 4-167943

Int. Cl.[6] B41J *19/30*

U.S. Cl. 400—322 **5 Claims**



1. A moving device, comprising:

a moving member;

a vibration driven actuator serving as a driving source for driving said moving member, said actuator having various characteristics effecting the moving speed of said moving member;

means for providing a driving frequency to said actuator; and

control means for detecting at least one of said characteristics effecting the moving speed of said moving member at a first operation before said moving member starts to execute a second operation, and for controlling said means for providing a driving frequency in response to the at least one detected characteristic to obtain a desired moving speed of said moving member after the start of the second operation, wherein the moving speed is changed by changing the driving frequency.

5,588,759

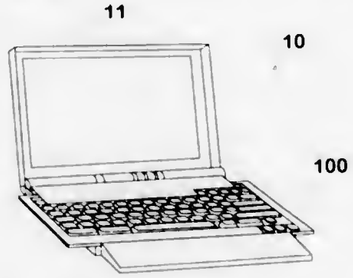
WRIST SUPPORT FOR EXPANDABLE KEYBOARDS

Gene Cloud, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 11, 1996, Ser. No. 587,418

Int. Cl.[6] B41J *5/10*

U.S. Cl. 400—472 **16 Claims**



1. An expandable keyboard having a wrist rest which comprises:

a housing having an elongated wrist rest portion including a cavity thereunder;

a keyboard being divided into movably separate sections; and

a translation assembly operatively connected to at least one keyboard section and configured to move that section between a collapsed position having at least a portion of that section stored in the cavity and an expanded position having that section free of the cavity and positioned substantially contiguous to and in the same plane as at least one other section of the keyboard.

5,588,760

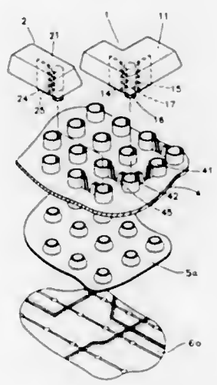
KEY SWITCH UNIT FOR COMPUTER KEYBOARDS

Henry So, No. 27, Lane 52, Nanking E. Rd., Sec. 4, Taipei, Taiwan

Filed Jan. 4, 1996, Ser. No. 583,161

Int. Cl.[6] B41J *5/12*

U.S. Cl. 400—495 **3 Claims**



1. A key switch unit for computer keyboards, comprising a membrane circuit having a plurality of electric contacts, a conductive rubber pad mounted on said membrane circuit and having a plurality of rubber cones respectively disposed above said electric contacts, a key holder frame mounted on said conductive rubber pad and having a plurality of key holders respectively disposed above said rubber cones, each key holder defining a longitudinal through hole aligned with one rubber cone, one L-shaped key switch and a plurality of elongated key switches and a plurality of square key switches respectively mounted on said key holders and depressed to trigger a respective electric contact in producing a respective electric signal, wherein each key holder comprises an inside annular flange raised around the periphery of the longitudinal through hole, a plurality of symmetrical longitudinal grooves inside the respective longitudinal through hole for guiding one key switch, a female guide means on the outside for guiding the respective key switch; each key switch comprises a key cap, and a stepped plunger inserted into the longitudinal through hole of one key holder, said L-shaped key switches and said elongated key switches each comprising at least one one male guide means respectively downwardly extending from the respective key cap, each male guide means being guided by said female guide means upon down stroke of the respective key switch, said stepped plunger comprising a thicker upper part, a thinner lower part, a plurality of symmetrical longitudinal ribs raised from said thicker upper part and respectively slidably inserted into the longitudinal grooves of one key holder, and at least one hook raised from said thinner lower part at a bottom side, and a step around the periphery between said thicker upper part and said thinner lower part.

5,588,761

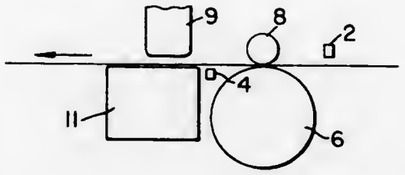
DOCUMENT PRINTER HAVING SKEW DETECTION

Ken L. Seib, 806 Daytona Dr., Palm Bay, Fla. 32705

Filed Dec. 8, 1995, Ser. No. 569,739

Int. Cl.[6] B41J *11/42*

U.S. Cl. 400—579 **3 Claims**



1. A document printer employing a commercially available dot matrix printer having printer control circuits, an input path, a stepper motor a print head, a platen and with tractors and tractor shaft removed, characterized by

a rubber coated roller having a shaft and opposed pinch rollers added in the input path to the printer,

said stepper motor connected to said shaft of said rubber roller to produce rotation of said roller,

a load sensor positioned in the input path before the roller for sensing a document presented to the roller,

circuit means for activating the stepper motor to rotate the stepper motor upon said load sensor sensing a document inserted along the input path,

a position sensor located in the input path adjacent the print head for indicating the presence of a document and producing a signal indicative thereof,

a skew sensor for producing a signal indicative of the presence of a document laterally of the position sensor at essentially the same location as the position along the path of the document through the printer, and

means responsive to all three sensors sensing a document for placing the printer under control of said printer control circuits.

5,588,762

PAPER DISCHARGE APPARATUS

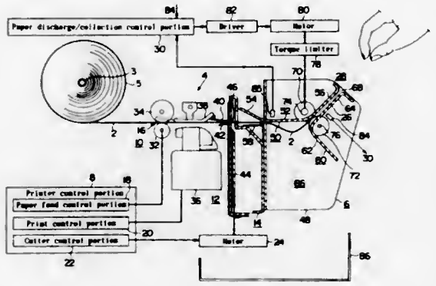
Kanji Suzuki, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka-ken, Japan

Filed Jan. 24, 1996, Ser. No. 592,863

Claims priority, application Japan, Feb. 1, 1995, 7-037595; Jul. 28, 1995, 7-212913

Int. Cl.[6] B41J *11/42*

U.S. Cl. 400—582 **11 Claims**



1. A paper discharge apparatus for discharging an arbitrarily cut paper from a paper discharge port comprising:

a paper feed means for feeding said paper;

a paper discharge means provided with paper discharge rollers for discharging said paper fed by said paper feed means to said paper discharge port;

a paper storage means for bending and storing said paper in said apparatus by operating said paper feed means alone while stopping a discharging operation of said paper discharge means when said paper fed by said paper feed means is delivered to said paper discharge means in a paper discharge mode; and

a paper collection means for collecting said paper in said apparatus when said paper discharged to said paper discharge port by said paper discharge means after said paper is stored in said paper storage means is not removed.

5,588,763

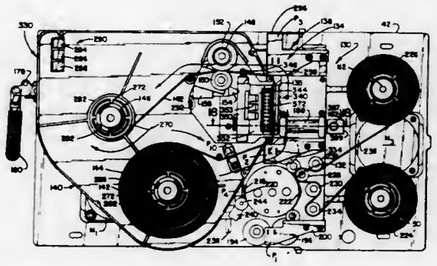
SYSTEM AND METHOD FOR CLEANING AND PRODUCING DATA BEARING CARDS

Richard C. Nubson, Eden Prairie; Glenn R. Carney, Eagan; Luc DeBleeckere, Crystal; Ronald B. Howes; Milo B. Squires, both of Minneapolis; David E. Wickstrom, St. Louis Park; Dennis J. Warwick, Richfield; Benjamin H. Sannel, St. Louis Park; Gretchen J. Moeller, Plymouth, all of Minn.; Paul R. Caron, Tiverton, and Harold D. Schofield, Naragansett, both of R.I., assignors to Datacard Corporation, Del.

Division of Ser. No. 20,005, Feb. 17, 1993, Pat. No. 5,401,111, which is a continuation of Ser. No. 698,733, May 10, 1991, abandoned, which is a division of Ser. No. 249,338, Sep. 23, 1988, Pat. No. 5,037,216. This application Oct. 18, 1994, Ser. No. 324,731

Int. Cl.[6] B41J *29/17*

U.S. Cl. 400—700 **18 Claims**



1. A magnetically encoded plastic card production system, comprising:

(a) supplying means for supplying a series of blank plastic cards;

(b) encoding means, operatively coupled to the supply means, for encoding a magnetic strip on each card;

(c) separating means, operatively coupled following the encoding means, having a roller surface for adhesively attracting loose particles from a surface of each card;

(d) design placing means, operatively coupled immediately following the separating means, for placing a graphic design on each card such that the loose particles are separated from each card subsequent to encoding the magnetic strip on each card and prior to placing the graphic design on each card; and

(e) collecting means, operatively coupled to the design placing means, for collecting each card after each card has passed through said encoding means, said separating means, and said design placing means.

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5,588,764

LOCK FOR DEFLECTABLE WRITING UTENSIL

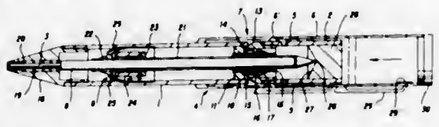
Hiroyasu Kato, Takizaki, Japan, assignor to Katoh Kinzoku Kogyo Kabushiki Kaisha, Tomioka, Japan

Filed Jul. 5, 1995, Ser. No. 498,124

Claims priority, application Japan, Jan. 26, 1995, 7-030135

Int. Cl.[6] B43K *7/12;24/00*

U.S. Cl. 401—99 **1 Claim**



1. A writing utensil comprising:

a forward external casing,

a rearward external casing,

a deflecting mechanism interposed between said forward external casing and said rearward external casing effective, when exposed, to permit angular deflection between said rearward external casing and said forward external casing,

an inserting tube carrying a writing implement slidably disposed within said forward casing and having a backward end containing a sliding head extending into said rearward external casing,

a supporting body having a cam surface thereon carried by said rearward external casing operative to extend said writing implement forwardly when said rearward external casing is angularly deflected with respect to said forward external casing, and

a lock casing slidably mounted on said rearward external casing and being operative, when in an extended position, to cover said deflecting mechanism and prevent deflection between said rearward external casing and said forward external casing and, when in a retracted position, to expose said deflecting mechanism whereby angular deflection between said casings is permitted to effect extension and retraction of said writing implement thereby.

5,588,765

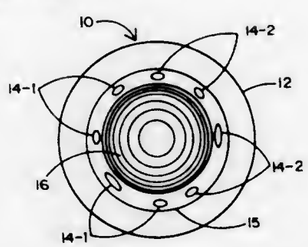
APPARATUS FOR ANALYZING SIGNATURES

Robert K. Campbell, Anaheim, Calif., assignor to Signa Scan, Inc., Anaheim, Calif.

Division of Ser. No. 98,582, Jul. 28, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 358,008

Int. Cl.[6] B43K *7/00;7/10*

U.S. Cl. 401—216 **2 Claims**



1. A ballpoint pen having a supply of ink and comprising a rolling ball retained within a rim at the forward end of the pen for applying the supply of ink to a writing surface and a plurality of indentations formed around the rim of said pen to produce a corresponding plurality of projections extending radially inward of said rim and aligned with said rolling ball to interrupt some of the supply of ink being applied by said rolling ball to the writing surface to thereby cause micro-striations to appear in each ink line applied to the writing surface, the distance between at least some of said plurality of indentations formed in said rim being greater than the distance between at least some other of said plurality of indentations such that the number of micro-striations in an ink line and the distance between the micro-striations in the ink line are indicative of whether the ink line was deposited by said ballpoint pen.

5,588,766

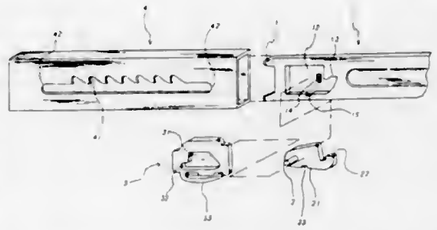
ASCENDING/DESCENDING STRUCTURE

Yu-Shan Lai, F4-3, No. 288, Tzu-Yu Rd., Chia-I Hsien, Taiwan

Filed Jan. 11, 1996, Ser. No. 583,821

Int. Cl.[6] F16B *7/14*

U.S. Cl. 403—105 **1 Claim**



1. An ascending/descending structure comprising a pull bar, a locking pin having a board-like locking pin seat with a rearwardly extending reverse hooking portion, a resilient retaining member, and a locking tube having saw tooth-like locking notches, said structure being characterized in that:

the pull bar is a rectangular bar having bent stopper portions at a bottom end for limiting movement of the resilient retaining member, a substantially rectangular window being formed on the pull bar near the bottom end thereof, the rectangular window having a hook-like slot thereon for limiting a movement of the rearwardly extending reverse hooking portion, a recess being formed in the rectangular window for retaining a spring therein;

the locking pin is a cylindrically shaped member integrally connected with the board-like locking pin seat, the rearwardly extending reverse hooking portion corresponds to the hook-like slot of the window of the pull bar, the board-like locking pin seat being formed with an arch dent pushable by the spring in the window of the pull bar so as to keep the locking pin abutting against one of the saw tooth-like locking notches of the locking tube;

the resilient retaining member is a plate-like member made of a resilient material, the resilient retaining member is formed with a window having an extending guide slot for engaging with the locking pin, a resilient arm extending from one side of the resilient retaining member for abutting against an inner wall of the locking tube;

the locking tube is a hollow rectangular bar formed with the saw tooth-like locking notches on one side and two locating slots extending respectively from two sides of the saw tooth-like locking notches; and

the board-like locking pin seat is placed in the rectangular window of the pull bar with the spring aligned with the arch dent of the board-like locking pin seat, the resilient retaining member being disposed on the board-like locking pin seat and the pull bar with the locking pin passing through the window of the resilient retaining member, the extending guide slot facing toward the bent stopper portions, the resilient arm being on the same side as the hook-like slot of the pull bar, wherein the pull bar, the locking pin, and the resilient retaining member are placed into the locking tube, the spring forcing the locking pin into said one of the saw tooth-like locking notches to be locked therein, whereby when it is desired to descend the pull bar, the pull bar being first pulled outward to a limitation position with the locking pin limited within the extending guide slot of the resilient retaining member and then pushed inward.

5,588,767

LOCKING JOINT MECHANISM

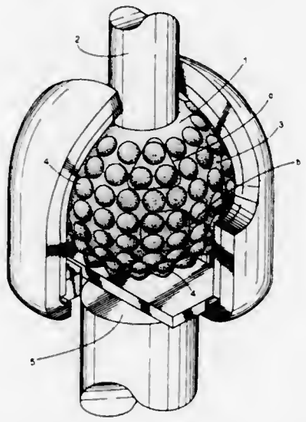
Werner O. Merlo, 51203 Range Rd. 265, Spruce Grove, Alberta, Canada

Continuation-in-part of Ser. No. 435,363, May 5, 1995, abandoned. This application Jun. 27, 1995, Ser. No. 495,104

Claims priority, application United Kingdom, May 5, 1994, 9408893

Int. Cl.[6] F16C *11/06*

U.S. Cl. 403—128 **12 Claims**



1. In an angularly adjustable, releasably lockable joint mechanism for rigidly joining first and second parts at a selected orientation, said mechanism comprising a rounded member having a plurality of concavities on its surface and being secured to the first part, a disengageable actuator having a rounded tip and being operative to advance the tip to lock up with the rounded member by penetrating a concavity or to retract the tip to disengage it from the rounded member, said actuator being connected with the second part, and means for holding the parts, rounded member and actuator together, said means being operative to allow the parts to change relative orientation when the actuator head is retracted,

the improvement comprising:

the rounded member having a plurality of patterns of spaced-apart protuberances covering at least part of its surface, the protuberances of each pattern forming a concavity therebetween;

the patterns and protuberances being consistent in shape, area and size, the patterns having a regular polygonal configuration;

the protuberances, actuator tip and patterns being dimensioned relative to each other so that the tip can penetrate the concavity of each pattern and simultaneously contact all of the protuberances of the pattern that it penetrates, with the contact between said actuator and protuberances being located so that said actuator remains spaced from the surface of the rounded member at full penetration, whereby the tip and pattern of protuberances lock together without said tip contacting the surface of said rounded member.

5,588,768

LOCKING ARRANGEMENT

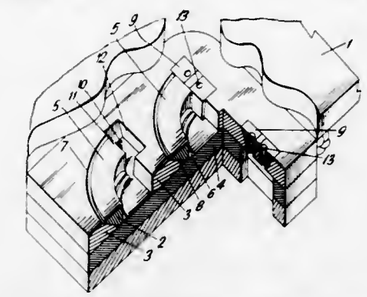
Robert I. Hedley, Via Singleton, Australia, assignor to Hedweld Engineering Pty Ltd., New South Wales, Australia

Filed Aug. 4, 1994, Ser. No. 286,012

Claims priority, application Australia, Aug. 5, 1993, PM0408

Int. Cl.[6] F16B *7/00;13/00;* **B25G** *3/00;* **F16G** *11/00*

U.S. Cl. 403—294 **9 Claims**



1. A locking arrangement for releasably securing a first member to a second member,

a surface of said first member having anchor means projecting therefrom with a lip portion of said anchor means transversely extending from an extremity of at least a portion of said anchor means,

a surface of said second member having a cutout portion defining an opening adapted to lockingly engage said anchor means, at least a portion of said cutout having a tongue around the opening thereof shaped to be positioned underneath said lip portion of said anchor means,

such that during use, a surface of each of said first and second members is aligned by positioning said anchor means within said cutout opening by sliding one member relative to the other and thereby cause engagement of said tongue underneath said lip portion, two keepers inserted in at least a part of said cutout not occupied by said anchor means to releasably secure said first member to said second member, wherein movement between said members is inhibited, each of said keepers having releasable interlocking portions adapted to retain said keepers together.

5,588,769

CONNECTIBLE LOCKING MECHANISM

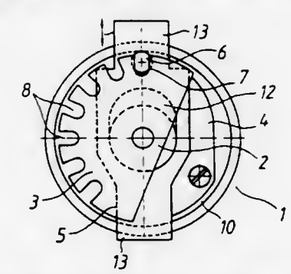
Paul Graefenhain, Heerbrugg, Switzerland, assignor to Leica AG, Heerbrugg, Switzerland

Filed Sep. 29, 1995, Ser. No. 536,172

Claims priority, application Germany, Sep. 30, 1994, 44 34 997.1

Int. Cl.[6] G05G *5/06;* **G02B** *21/24;15/00*

U.S. Cl. 403—322 **12 Claims**



1. A connectible locking mechanism for a continuously operating zoom system of a microscope, comprising:

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a drive unit including a drive shaft for setting a zoom;

a locking disk provided axially on and fixedly connected to the drive shaft, the locking disk defining grooves which are arranged side by side;

a locking spring arranged fixedly to an instrument of said microscope;

a locking slider provided with a recess and arranged between the locking spring and the locking disk; and

a ball arranged between the locking spring and the locking disk in the recess of the locking slider, the ball being movable into and out of engagement with the grooves of the locking disk through a sliding motion of the locking slider.

5,588,770

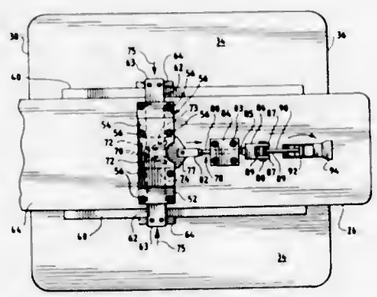
QUICK RELEASE AND ADJUSTABLE PALLET ASSEMBLY FOR TEXTILE SCREEN PRINTING MACHINE

Mark Bart, DesPlaines, Ill., assignor to A.W.T. World Trade, Inc., Chicago, Ill.

Filed Sep. 27, 1995, Ser. No. 534,284

Int. Cl.[6] B41M *1/12;* **F16B** *5/06*

U.S. Cl. 403—325 **6 Claims**



1. A quick release locking mechanism for mounting a pallet on a support bed or platform of a single or multi-color screen printing apparatus, said locking mechanism adapted to be installed on the underside of the platform and said pallet having rail means protruding from its undersurface opposite its work surface on which a workpiece is to be carried for printing of a multi-color composite image thereon, said mechanism comprising:

A) a pair of housings adapted to be secured to a medial portion of said underside of the platform spaced apart and laterally aligned one with the other;

B) an enlongate linear member slidable in each housing and having opposite ends thereof protruding from opposite extremities of its associated housing, one of said protruding ends of each linear member having a locking member upstanding thereon to form a track-like space between the locking member and the associated housing for accommodating the rail means therein;

C) the opposite end of each elongate member having an upstanding pin member thereon;

D) a slidable plate positioned in said space between the housings and having a pair of angularly displaced slots therein each having a pin member slidably engaged therein; and

E) articulated linkage means connected to said plate for sliding same in said space for reciprocating the pins in the slots whereby to selectively engage said locking members against the rail means and withdraw the locking members from engagement with said rail means thereby freeing the pallet from the platform.

5,588,771

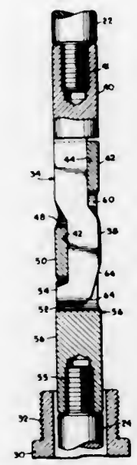
CONNECTOR FOR COUPLING A PAIR OF RODS

Gregory H. Scott, Salina, and Melvin P. Kejr, Brookville, both of Kans., assignors to Kejr Engineering, Inc., Salina, Kans.

Filed Apr. 20, 1995, Ser. No. 425,931

Int. Cl.[6] F16B *7/22*

U.S. Cl. 403—353 **8 Claims**



1. Structure for connecting a pair of elongated rods in axial alignment for transmitting axial and rotational forces along a longitudinal axis of the rods through the connection, said structure comprising:

interfitting male and female sections projecting in longitudinal extension from their corresponding respective rods;

the male section including an elongated transversely polygonal member which comprises an elongated transversely rectangular bar projecting from an end of the male section, said elongated transversely rectangular member having a transversely extending notch having endwalls presenting a pair of oppositely facing shoulders extending transversely of the corresponding elongated rod;

the female section comprising an elongated channel having a cross-section configuration for complementally receiving the male section for rotation with the latter and having a transversely extending segment configured to be received in the notch when the rods are in axial alignment to lack the rods together for axial movement as a unit;

the female section including a pair of elongated apertures respectively positioned on opposite facing surfaces of the channel relative to the longitudinal axis, the apertures communicating the channel with the exterior of the female section, the apertures being positioned to permit the sections to be moved into or removed from their connected positions when the rods are disposed in positions with their respective longitudinal axes at an angle with respect to one another; and

wherein the elongated bar includes the transversely extending notch on one side, and a second transversely extending notch on an opposite side of the longitudinal axis from the one side and longitudinally offset from the first transversely extending notch.

5,588,772

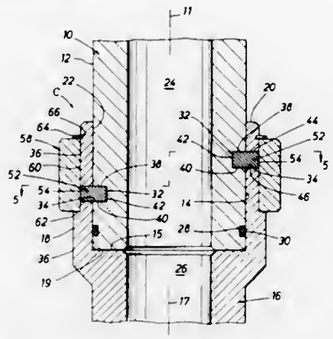
HIGH STRENGTH, QUICK CONNECT/DISCONNECT COUPLING

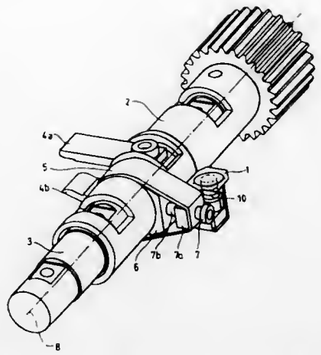
George P. Johnson, Jr., Tomball, Tex., assignor to North Houston Machine, Inc., Tomball, Tex.

Continuation-in-part of Ser. No. 82,663, Jun. 25, 1993, Pat. No. 5,409,324. This application Mar. 13, 1995, Ser. No. 403,279

Int. Cl.[6] F16L *25/06;* **F16B** *21/12*

U.S. Cl. 403—355 **19 Claims**





1. A quick connect/disconnect coupling for transferring torque comprising:

a first cylindrical member having an outer peripheral surface and an end portion, said end portion having a transverse keyway in said outer peripheral surface;

a second cylindrical member having a receiving end portion, said receiving end portion having an end face with a longitudinal bore therein for receiving said end portion of said first cylindrical member, said receiving end portion having a transverse slot therethrough;

a key received in said transverse keyway and protruding therefrom into said transverse slot; and

a retainer member extending over said key in said transverse slot of said receiving end portion of said second cylindrical member,

wherein said key is freely received within said transverse keyway and said transverse slot and freely contained between said retainer member and said transverse keyway, said key non-rotatably connects said first cylindrical member to said second cylindrical member.

5,588,773

DEVICE FOR CONNECTING A MACHINE ELEMENT TO A STRUCTURAL MEMBER MOVABLE ABOUT ITS LONGITUDINAL AXIS SO THAT THE MACHINE ELEMENT AND THE STRUCTURAL MEMBER ARE SECURED AGAINST RELATIVE ROTATION

Jens Friedrichs, Heidelberg, and Karl-Heinz Helmstädter, Sinsheim, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed May 26, 1994, Ser. No. 249,549

Claims priority, application Germany, May 26, 1993, 43 17 429.9

Int. Cl.[6] B41F *21/04*

U.S. Cl. 403—373 **7 Claims**

1. In combination, a gripper stop of a printing press, a hollow shaft oscillatorily movable about a central longitudinal axis thereof, and a device for clamping the gripper stop at the circumference of the hollow shaft, at one of an infinite number of phase angles with respect to the hollow shaft, so that the gripper stop and the hollow shaft are secured against relative rotation, the device comprising a steel belt embracing more than 180° of the circumference of the hollow shaft and being firmly connected to the gripper stop, a gripper pivotally connected on the hollow shaft and resiliently supported against the gripper stop, a thrust piece having an inner side matching the circumferential profile of the hollow shaft, and at least one clamping bolt having a bolt part and a nut part threaded thereon, said steel belt being fixed to said nut part of said clamping bolt, and said bolt part of said clamping bolt being turnable so as to clamp said thrust piece radially with respect to the central longitudinal axis of the hollow shaft.

5,588,774

APPARATUS FOR ARRESTING THE PROGRESS OF VEHICLES

Kevin Beban, Watford, United Kingdom, assignor to CatsClaw Limited, St. Albans, United Kingdom

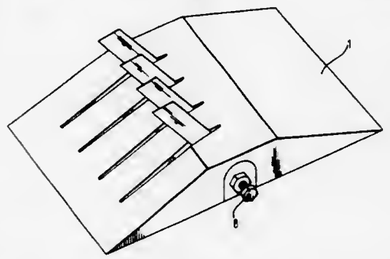
PCT No. PCT/GB92/01598, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO93/05236, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 1, 1992, Ser. No. 199,324

Claims priority, application United Kingdom, Sep. 3, 1991, 9118817; Nov. 13, 1991, 9124137

Int. Cl.[6] E01F *13/00*

U.S. Cl. 404—6 **15 Claims**



1. Apparatus for selectively arresting the progress of vehicles, comprising: a plurality of releasably connected modules, each module being shaped to lie on a road surface to allow the passage of a vehicle thereover, and having vehicle arresting means moveable between a retracted position inside the module and an operative position in which the arresting means protrudes from the module to prevent progress of the vehicle, the modules being interconnected by an actuating means which enables simultaneous actuation of all the arresting means, the actuating means comprising male and female connectors, each male connector comprising a member adapted to locate in a female connector and including cooperating means such that rotation of the male member causes rotation of the female connector, wherein the female connector comprises a channel into which the male member is received, the channel having a lip portion for preventing axial removal of the

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male connector and the distance from a base of the channel to the plane of the lip being greater than the depth of at least a portion of the part of the male member which, in situ, is located directly between the lip and base to allow limited axial and/or tilting movement of the male member in the channel.

5,588,775

PAVING STONE SET AND PROCESS AND DEVICE FOR THE MANUFACTURE THEREOF

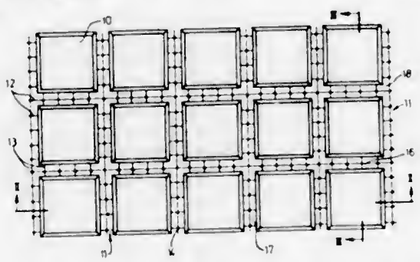
Gerhard Hagenah, Worpswede, Germany, assignor to SF-Kooperation GmbH Beton-Konzepte, Bermen, Germany

Continuation of Ser. No. 244,103, May 19, 1994, Pat. No. 5,486,066. This application Sep. 29, 1995, Ser. No. 556,289

Claims priority, application Germany, Nov. 23, 1991, 41 38 564.0

Int. Cl.[6] E01C *11/16*

U.S. Cl. 404—45 **3 Claims**



1. A paving stone set made up of a region of concrete paving stones (**10**) which are spaced apart to create a region of longitudinal gaps (**16**) and transverse gaps (**17**), wherein the concrete paving stones are joined together by a holding grid (**11**) and are secured against displacement, and wherein:

a) said concrete paving stones (**10**) are joined together exclusively by said holding grid (**11**);

b) said holding grid (**11**) consists of tension-resistant and nonperishable elastic material;

c) said holding grid (**11**) lies continually exposed in said region of said longitudinal gaps (**16**) and transverse gaps (**17**);

d) said holding grid (**11**) is fully embedded in said concrete paving stones (**10**) exclusively in said region thereof;

e) said holding grid (**11**) is embedded in said concrete paving stones (**10**) at a distance from a bottom side (**15**) of said concrete paving stones (**10**), which distance corresponds to one-quarter to one-third of the total height of one of said concrete paving stones (**10**); and

f) said holding grid (**11**) comprises spaced-apart longitudinal strands (**12**) and spaced apart transverse strands (**13**), the spacing between the longitudinal strands (**12**) and between the transverse strands (**13**) measuring 2 cm to 5 cm.

5,588,776

PAVING MACHINE HAVING AUTOMATIC METERING SCREED CONTROL

George W. Swisher, Jr., Oklahama City, and John F. Phillips, Yukon, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 185,428, Jan. 21, 1994, Pat. No. 5,452,966. This application Jun. 6, 1995, Ser. No. 469,139

Int. Cl.[6] E01K *19/18*

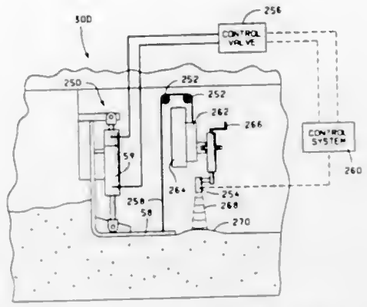
U.S. Cl. 404—72 **16 Claims**

1. A paving machine comprising:

a frame;

means for propelling said frame over a surface to be paved;

distributing means, carried by said frame, for providing volume of unhardened concrete on the surface beneath said frame;



a metering screed carried by said frame and adapted to engage and meter out the concrete at a selected target depth over the surface beneath said frame;

a sensor carried by said frame and adapted to produce measurements of the distance between said sensor and the surface of the concrete at an area behind said metering screed;

link means, connected to said metering screed and said sensor, for vertical movement of said sensor in response to the opposite vertical movement of said metering screed; and

control means, operatively connected to said sensor and said metering screed, for positioning said metering screed to change the volume of concrete being metered out by said metering screed, said control means being adapted to receive the sensor measurements and a tolerance from an operator of the paving machine, the tolerance being a range of distances corresponding to a selected depth for the concrete;

wherein said control means re-positions said metering screed in response to the sensor measurements which are outside the tolerance.

5,588,777

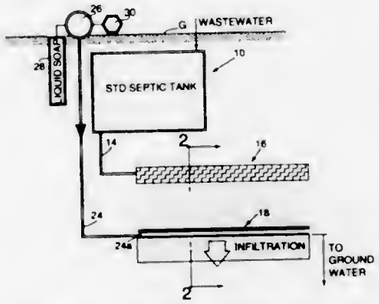
WASTEWATER TREATMENT SYSTEM

Rein Laak, 149 Browns Rd., Storrs Mansfield, Conn. 06268-2808

Filed Jun. 30, 1995, Ser. No. 497,616

Int. Cl.[6] E02B *11/00*

U.S. Cl. 405—40 **5 Claims**



1. A subterranean wastewater treatment system that receives wastewater containing both nitrates and other waste products and comprising in combination;

a holding tank having an inlet for receiving the wastewater and settling out the waste products so that a liquid effluent with nitrates included therein is provided in the holding tank, and

said holding tank further including an outlet for discharging the effluent from said holding tank,

a leaching field to provide an anaerobic atmosphere for receiving the effluent from said tank outlet,

a porous bed below said field, said bed including at least one horizontally disposed in-drain provided in said porous bed, and

conduit means coupled to said in-drain for injecting a liquid soap into said in-drain to enhance biological activity of the nitrates in the effluent reaching said in-drain in an anaerobic atmosphere.

5,588,778

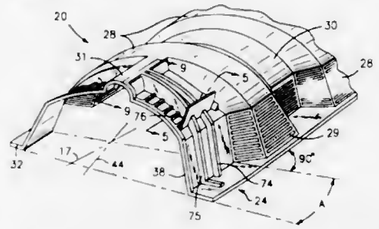
LEACHING CHAMBER WITH ANGLED END

James M. Nichols, Old Saybrook, and Bryan A. Coppes, Clinton, both of Conn., assignors to Infiltrator Systems Inc., Old Saybrook, Conn.

Filed May 19, 1995, Ser. No. 444,388

Int. Cl.[6] E02B *13/00*

U.S. Cl. 405—48 **13 Claims**



1. In a chamber, for dispersing or gathering liquids within soil, of the type having an arch shape cross section, wherein the base of the chamber corresponds with the base of the arch; the chamber having opposing first and second ends spaced apart along a primary longitudinal axis, the ends having terminuses shaped to enable mating of the chamber with other chambers to form a string of chambers; the improvement comprising: a first end of the chamber having a first terminus angled with respect to the chamber longitudinal axis, the first terminus enabling a similar chamber to be mated thereto, to provide a basic axial alignment angle greater than zero between the mated chambers; wherein, the improvement enables a string of like chambers to be connected to follow an approximate curve.

5,588,779

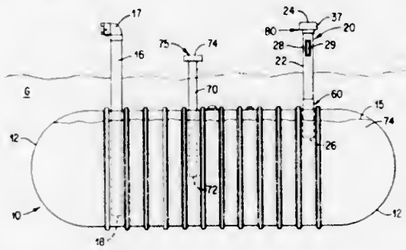
SIGHT, VENT, AND DRAIN ASSEMBLY FOR AN UNDERGROUND TANK

Stanley L. Merrett, Dadeville, Ala., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Filed Jun. 7, 1995, Ser. No. 483,408

Int. Cl.[6] G01F *23/56*

U.S. Cl. 405—54 **12 Claims**



1. An improved apparatus for fire suppression of the type comprising a tank disposed beneath the ground for holding fluid therein and a dry hydrant head having a first end above the ground and an opposite second end in communication with the fluid in the tank, wherein the improvement comprises means for visually determining the level of the fluid inside the tank which is disposed beneath the ground and used for fire suppression.

12. A method of fire suppression using a tank disposed beneath the ground for holding fluid therein, a dry hydrant head having a first end above the ground and an opposite second end in communication with the fluid in the tank, comprising the steps of:

a) adding fluid to the tank;

b) applying a demand pressure to the dry hydrant head to begin drawing fluid from the tank for fire suppression; and

c) viewing a color indicator so as to determine the level of fluid in the tank.

5,588,780

METHOD AND INSTALLATION FOR LAYING A PIPE-LINE

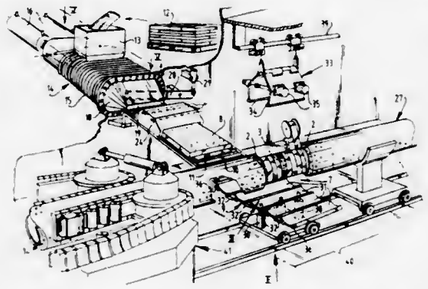
Dick R. Wolbers, 's-Gravenhage, and Ronkers Koerse, Twisk, both of Netherlands, assignors to All Seas Group S.A., Switzerland

Filed Jun. 7, 1995, Ser. No. 475,802

Claims priority, application Netherlands, Aug. 6, 1994, 9400933

Int. Cl.[6] F16L *1/12*

U.S. Cl. 405—170 **9 Claims**



1. Method for laying a pipe-line (**27**) on a seabed, wherein pipes on a vessel are welded to each other along a ring weld (**3**) and wherein the ring weld (**3**) is covered with a ring of mastic (**6**), the thickness of which is greater than 30 mm, which mastic comprises bitumen and filler, characterized in that the mastic is arranged around the ring weld (**3**), said mastic at a temperature wherein it is in a deformable state.

5,588,781

LIGHTWEIGHT, WIDE-BODIED COMPLIANT TOWER

Susan L. Smolinski; Denby G. Morrison, both of Houston, Tex.; Peter W. Marshall, Stocksfield, England, and David A. Huete, Spring, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1993, Ser. No. 175,898

Int. Cl.[6] E02B *17/00*

U.S. Cl. 405—195.1 **20 Claims**

1. A lightweight, wide-bodied compliant tower for conducting hydrocarbon recovery operations from a deepwater offshore reservoir, comprising:

a foundation;

a compliant framework, comprising:

a plurality of vertically extending legs secured to the foundation; and

a plurality of horizontal bracing directly interconnecting the legs in a manner defining a substantially open riser suspension corridor extending substantially the entire length of the compliant framework without regular vertical intervals of riser load transfer structure; and

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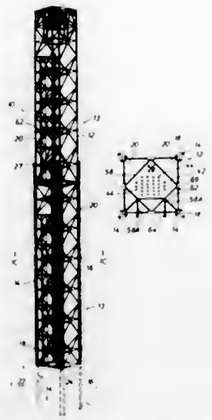


a topside facility supported by the compliant framework.

2. A lightweight, wide-bodied compliant tower for conducting hydrocarbon recovery operations from a deepwater offshore reservoir, comprising:

a foundation;

a compliant framework, comprising:

a plurality of vertically extending legs secured to the foundation; and

a plurality of horizontal bracing interconnecting the legs in a manner maintaining a substantially open riser suspension corridor extending substantially the entire length of the compliant framework;

a topside facility supported by the compliant framework; and

a freely suspended riser extending through the riser suspension corridor from the vicinity of the topside facility to communicate with the reservoir.

14. A method for economically reducing the natural period of the whipping mode harmonic response in a deepwater compliant tower having a vertically extending compliant framework secured to a foundation at an ocean floor and supporting a topside facility above the ocean surface and having a plurality of risers communicating between the topside facility and a plurality of wells at the ocean floor through a running span, the method comprising:

providing the compliant framework in a wide body configuration such that the following relation is met over at least 70% of the length of the compliant framework:

$$L/\sqrt{A} < 12$$

where:

L is the total length of the compliant framework; and

A is the area of a cross section of the compliant framework at a given elevation;

providing a substantially open vertically extending riser suspension corridor that is braced only at its periphery; and

suspending the risers in a top-tensioned relation from a riser support at the top end of the compliant framework and deploying the running spans of the risers through the riser suspension corridor without supplying intermediate supports at regular intervals along the compliant framework.

17. A method for improving the fatigue characteristics of a compliant tower by enhancing a wave cancellation effect, comprising:

establishing a compliant framework having a plurality of legs interconnected with a plurality of horizontal bracing in a manner which maintains a substantially open riser suspension corridor extending through the compliant framework at least the full depth of the wave zone; and

freely suspending risers through the riser suspension corridor;

the compliant framework and freely suspended risers presenting surfaces such that waves impact a first side of the compliant tower, pass through the risers and the interior of the compliant framework substantially unimpeded, and impact a second side of the compliant tower with a force which is significant in relation to the force of the impact on the first side.

5,588,782

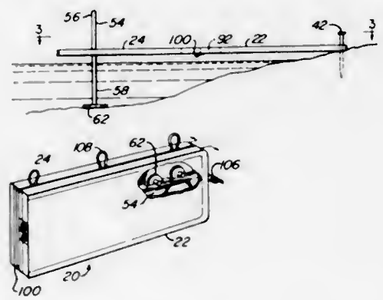
PORTABLE BOAT DOCK

William F. Haring, 8839 Holly La., Riverside, Calif. 92503

Filed Feb. 8, 1995, Ser. No. 385,453

Int. Cl.[6] B63C *1/00*

U.S. Cl. 405—218 **22 Claims**



16. A dock, comprising:

a first dock section having a first end, a second end, and a first deck portion extending therebetween;

means for anchoring said first end of said first dock section to a supporting surface;

a second dock section having a first end, a second end, and a second deck portion extending therebetween, said first end having support member engagement means thereon;

a hinge attached to said second end of said first dock section and to said second end of said second dock section;

a fastener attached to said first and second dock sections for securing together said first and second dock sections in a storage configuration of said dock;

at least one support member attached to said engagement means on said second dock section and contacting said supporting surface of upholding said dock;

means for retaining each support member between said first and second dock sections in the storage configuration; and

at least one handle attached to at least one of said first and second dock sections for transporting said dock.

5,588,783

SOIL REINFORCEMENT WITH ADHESIVE-COATED FIBERS

William N. Brabston, and Philip G. Malone, both of Vicksburg, Miss., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1992, Ser. No. 880,414

Int. Cl.[6] E02D *3/12*

U.S. Cl. 405—258 **12 Claims**

1. A method of soil reinforcement, comprising:

providing at least one fiber;

coating said at least one fiber with an adhesive material;

mixing said coated at least one coated fiber with the soil, thereby adding strength and cohesion to the soil and reducing erosion and shear failure in the soil.

5,588,784

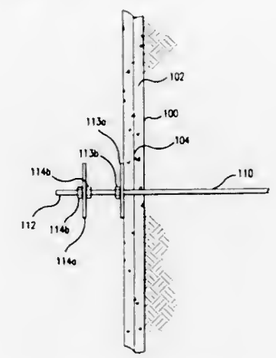
SOIL OR ROCK NAIL WALL WITH OUTER FACE AND METHOD OF CONSTRUCTING THE SAME

Ernest D. Brandl, Houston, Tex., and David E. Weatherby, Potomac, Md., assignors to Schnabel Foundation Company, Sterling, Va.

Filed Jun. 7, 1995, Ser. No. 485,276

Int. Cl.[6] E02D *5/20*

U.S. Cl. 405—262 **66 Claims**



1. A method of constructing a retaining wall comprising the following steps:

excavating a cut in successive sections to form exposed cut faces;

temporarily shoring up the exposed cut face of each successively excavated section with a temporary support means, said temporary support means comprising a nail installed through the exposed cut face into the ground, a first end of said nail extending outwardly from said exposed cut face; and

forming an outer face by

positioning a first attachment means adjacent to said exposed cut face, said first attachment means having a first end and a second end,

securing said first end of said first attachment means to said exposed cut face,

erecting a first facing element,

securing said first facing element to said second end of said first attachment means,

erecting a second facing element adjacent to said first facing element,

placing reinforced concrete along the area of said retaining wall adjacent to said first end of said nail between said exposed cut face and said first and second facing elements, said reinforced concrete thereby forming a permanent structural connection between said first and second facing elements and said nail by encasing said first end of said nail, and

placing backfill material along the remaining area of said retaining wall between said exposed cut face and said first and second facing elements.

5,588,785

LIQUID HYDROCARBON SORBING AND SOLIDIFYING PILLOW

Herbert W. Holland, 2314 Chimney Rock, Houston, Tex. 77056

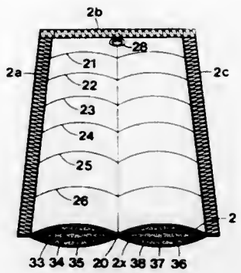
Continuation-in-part of Ser. No. 222,844, Apr. 5, 1994, Pat. No. 5,462,785. This application Jul. 24, 1995, Ser. No. 506,091

Int. Cl.[6] E02D *31/00;* **B32B** *3/00*

U.S. Cl. 405—270 **21 Claims**

1. A liquid hydrocarbon absorbent device comprising:

a pillow having a plurality of chambers formed in stratification therein by internal layers of textile material;



a polymer material disposed in the chambers having a property of acting to absorb and solidify liquid hydrocarbon substances coming into contact with the pillow and migrating to its interior;

a plurality of quilting seams in the pillow defining a multiplicity of hydrocarbon absorption consolidation points therein and subdividing each chamber into distinct hydrocarbon absorption units within the pillow; and

an outer facing layer of an impermeable material extending over a surface of the pillow and acting to retain liquids within the pillow.

5,588,786

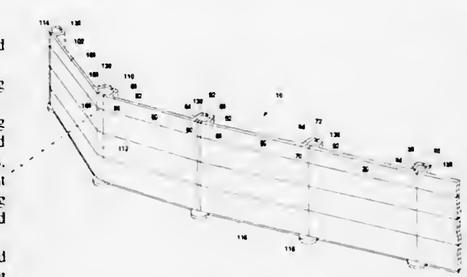
COMBINATION RETAINING WALL AND METHOD OF CONSTRUCTION

Randall H. House; Johann H. Hofmann, both of San Antonio, and Freddie C. Birck, Boerne, all of Tex., assignors to Marylyn House, San Antonio, Tex.

Continuation-in-part of Ser. No. 917,841, Jul. 21, 1992, Pat. No. 5,471,811, which is a continuation-in-part of Ser. No. 675,503, Mar. 26, 1991, and Ser. No. 601,413, Oct. 22, 1990, Pat. No. 5,131,786, which is a continuation-in-part of Ser. No. 347,482, May 4, 1989, Pat. No. 4,964,750. This application Jun. 7, 1995, Ser. No. 475,212

Int. Cl.[6] E02D *5/10;29/02;* **E04B** *2/00*

U.S. Cl. 405—285 **18 Claims**



1. A precast concrete wall capable of being rapidly and efficiently constructed and capable of withstanding nominally applied overturning and destructive forces comprising:

a. a plurality of C-shaped wall segments wherein said C-shaped wall segments have a generally similar C-shaped cross-section, each C-shaped wall segment comprising:

i. a vertically arranged precast concrete panel having a thickness, a height, and a first generally vertical edge and a second generally vertical edge;

ii. a first generally vertically disposed U-shaped member and a second generally vertically disposed U-shaped member, each said first and said second U-shaped member having a front leg and a rear leg, and a thickness and a height substantially similar to said thickness and said height of

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said panel, each said first and said second U-shaped members horizontally located at opposite ends of said panel;

iii. said panel located in a horizontal plane from said front leg of said first U-shaped member to said front leg of said second U-shaped member;

b. said first U-shaped member of a first C-shaped wall segment adapted to be located adjacent to said second U-shaped member of a second C-shaped wall segment for forming a stay-in-place form for casting a structural support column on-site, said structural support column securing said first C-shaped wall segment to said second C-shaped wall segment, said stay-in-place form having a cavity extending vertically throughout substantially the entire height of said stay-in-place form;

c. means, located in said cavity of said stay-in-place form, for reinforcing said column;

d. cast-in-place concrete positioned in said cavity of said stay-in-place form and encasing said reinforcing means; and

c. said stay-in-place form being a part of said column once said cast-in-place concrete hardens.

5,588,787

PULSE-OPERATED POINT FEEDER

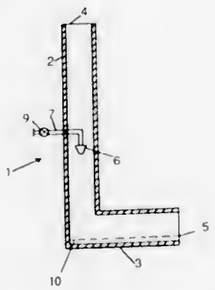
Konanur Manjunath, Porsgrunn; Knut A. Paulsen, Avaldsnes, and Lelv B. Ognedal, Porsgrunn, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Jun. 22, 1995, Ser. No. 493,534

Claims priority, application Norway, Jun. 22, 1994, 942371

Int. Cl.[6] B65G *53/20*

U.S. Cl. 406—85 **7 Claims**



1. A metering device for metering accurate doses of powder material, said device comprising:

a vertical tube and a horizontal tube joined together to form an L-shaped channel, said vertical tube having an upper end defining an inlet for supply of powder material to said channel, and said horizontal tube having an end opposite said vertical tube and defining an outlet for discharge of metered doses of powder material from said channel;

a nozzle device mounted in said vertical tube and including at least one downwardly facing hole; and

means for supplying intermittent gas pulses to said nozzle device resulting in at least one pulsed air flow from said at least one hole through a portion of said channel defined by a lower part of said vertical tube below said nozzle device and by the whole of said horizontal tube, and thereby for discharging from said outlet doses of powder material metered as a function of said pulses.

5,588,788

DOUBLE HEADED FASTENER

Armando Dominguez, 2471 W. 65th St., Hialeah, Fla. 33016

Filed Jul. 7, 1994, Ser. No. 271,618

Int. Cl.[6] F16B *15/02;* **H02G** *3/08*

U.S. Cl. 411—482 **4 Claims**

1. An elongated nail member including a shaft, having two ends, and said elongated nail member further including first and second heads and said first head defining one end of said nail member and said second head being positioned along said shaft at a spaced apart relationship with respect to said first head and on said shaft and the other end of said shaft having a pointed termination, the improvement comprising a weakened portion on said shaft located at a position separated a predetermined distance from said second head and opposite to said first head.

5,588,789

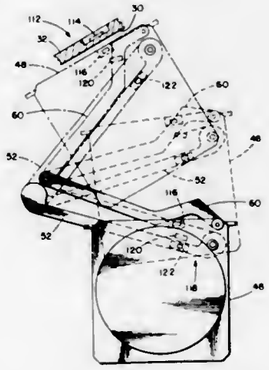
LOAD ARM FOR LOAD LOCK

Richard S. Muka, Topsfield, Mass., and Christopher A. Hofmeister, Hampstead, N.H., assignors to Brooks Automation, Chelmsford, Mass.

Filed Jul. 6, 1995, Ser. No. 498,835

Int. Cl.[6] B25J *11/00*

U.S. Cl. 414—217 **21 Claims**



1. Apparatus for transferring a load comprising:

a base member;

a planar platform for supporting a load; and

drive arm means mounted on said base member for moving said platform in plane between a retracted position whereat said platform assumes a first orientation and an extended position whereat said platform assumes a second orientation angularly transposed from the first orientation while remaining substantially in the plane occupied when in the retracted position; and

resilient means biasing said platform to the retracted position;

said drive arm means including:

a drive arm pivotally mounted on said base member and movable between the retracted position and the extended position;

a drive arm shaft rotatably mounted on said base member, said drive arm being fixed to said drive arm shaft for movement of said platform between the retracted position and the extended position;

a constraining link extending between said base member and said platform;

a first link pin for pivotally connecting said constraining link and said base member;

a second link pin distant from said first link pin for pivotally connecting said constraining link and said platform; and

a drive arm pin distant from said drive arm shaft for pivotally connecting said drive arm and said platform;

said first link pin being proximate to, but spaced from, said drive arm shaft; and

said second link pin being proximate to, but spaced from, said drive arm pin.

5,588,790

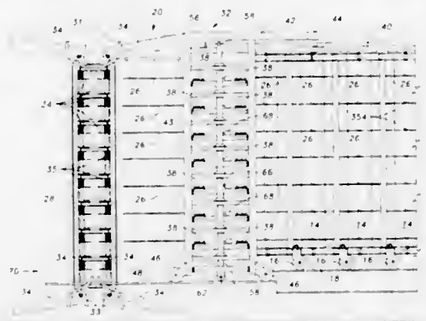
HIGH SPEED STORAGE SYSTEM

Robert D. Lichti, P.O. Box 1489, Chester, Calif. 96020

Filed Nov. 1, 1993, Ser. No. 151,971

Int. Cl.[6] B65G *1/10*

U.S. Cl. 414—331 **30 Claims**



1. A storage system for storing and handling individual containers comprising:

a storage carousel unit moveably mounted for substantially continuous generally horizontal movement along a generally endless path, said storage carousel unit including multiple racks and said racks including multiple tiers of carousel shelves;

a storage carousel drive assembly adapted to drive said storage carousel unit along said endless path;

a vertical lift unit spaced from said storage carousel unit, said vertical lift unit including a plurality of lift forks, said lift forks being mounted for generally vertical movement along ascending and descending reaches of said vertical lift unit, the lift forks momentarily adjacent the bottom of said vertical lift unit defining a lower level;

an input shuttle unit including a plurality of rows of input shuttle forks, said rows including a lower row, said input shuttle forks adapted to being driven between said storage carousel unit and said vertical lift unit in a generally horizontal direction in substantial synchronization with the movement of said storage carousel unit, the input shuttle forks being adapted to being driven individually and selectively in a generally vertical direction to engage and release containers, whereby the input shuttle unit is adapted to take pre-selected containers from said vertical lift unit and transfer them to said storage carousel unit;

an output shuttle unit including a plurality of ranks of output shuttle forks, said ranks including a lower rank, said output shuttle forks adapted to being driven between said storage carousel and said vertical lift unit in a generally horizontal direction in substantial synchronization with the movement of said storage carousel, the output shuttle forks being adapted to being driven individually and selectively in a generally vertical direction to engage and release containers, whereby the output shuttle unit is adapted to take pre-selected containers from the storage carousel unit and transfer them to said vertical lift unit, said lower level on said vertical lift unit being normally below the lower row and lower rank of said shuttle forks;

a conveyor section positioned adjacent said vertical lift unit and adapted to transfer containers to and from said lower level.

5,588,791

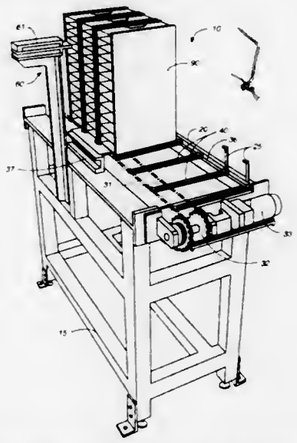
APPARATUS FOR SEQUENTIALLY DELIVERING ARTICLES CONTAINED IN CASSETTES

Minoru Akagawa, Fremont, Calif., assignor to Intelmatec Corporation, Fremont, Calif.

Filed Aug. 10, 1995, Ser. No. 513,275

Int. Cl.[6] B65G *1/06*

U.S. Cl. 414—331 **9 Claims**



1. An apparatus for sequentially delivering articles to a specified article-receiving position from each of a plurality of cassettes each containing a plurality of said articles slidably one above another, said apparatus comprising:

a frame with a top plate having longitudinally elongated first and second side edges opposite each other, there being formed a cut through said top plate and extending from a center point along said second side edge towards said first side edge;

endless chains with horizontal parts extending longitudinally along said first side edge above said top plate;

chain-moving means for moving said horizontal parts of said endless chains longitudinally in one direction;

a plurality of cassette-carrying bars extending transversely to said longitudinally elongated top plate with one end attached to said endless chains for carrying said cassettes removably thereon and transporting said cassettes longitudinally above said top plate;

guide rails extending horizontally and longitudinally along said second side edge for supporting the other ends of said cassette-carrying bars;

lifting means adapted to move vertically through said cut in said top plate for lifting said cassettes one at a time; and

pushing means for pushing one of said articles horizontally out of one of said cassettes.

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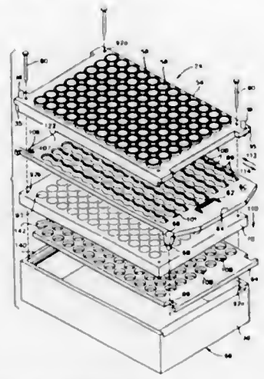
5,588,792
PIPETTE TIP RACK LOADER
Allan Tiso, 879 Del Valle Dr., Fallbrook, Calif. 92028
Filed Mar. 16, 1995, Ser. No. 405,083
Int. Cl.[6] B65G *59/06*
U.S. Cl. 414—404 **23 Claims**

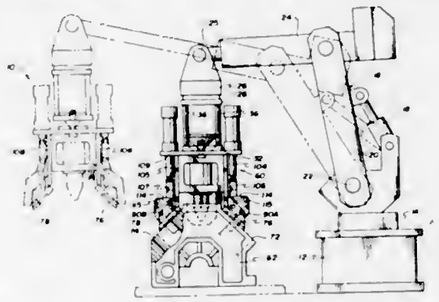


1. A dispenser for dispensing pipette tips downwardly under the force of gravity, said dispenser comprising:
a frame having a top end and a bottom end spaced from said top end;
means in said dispenser defining an interruptible tip passage path;
a top plate coupled to said top end of said frame, said plate being formed with a plurality of apertures therethrough, each said aperture being adapted to receive a plurality of tips in a mutually nested stack, the bottom tip in the stack of tips extending through said aperture, said apertures defining the top portion of said tip passage path;
means below said top plate cooperative with the shape and configuration of each tip to selectively prevent the tips from passing completely through said apertures in said top plate and out the bottom end of said frame;
means for wedging apart the bottom tip from the next upper tip nested in the bottom tip by retaining in position the bottom-most tip while moving the remainder of the stack of tips apart therefrom; and
means for selectively permitting the bottom tip to pass completely through said tip passage path and fall independently from the remaining tips in the nested stack through said aperture and out the bottom end of said frame, said wedging means being shaped and configured to retain the remaining tips in the nested stack in said aperture in said top plate when the bottom tip passes out the bottom end of said frame.

5,588,793
ELEVATOR MECHANISM FOR VEHICLE
Hueng-San Chang, 12, Si Wei St., Taoyuan, Taiwan
Filed Mar. 2, 1995, Ser. No. 397,407
Int. Cl.[6] B60P *1/26;* **B60F** *1/00*
U.S. Cl. 414—557 **3 Claims**

1. An elevator mechanism for a vehicle comprising:
at least one support for securing an elevator mechanism to a vehicle, said support including an upper portion and a lower portion,
at least one coupler including an upper portion, a middle portion and a lower portion,
at least one first link pivotally coupled between said upper portion of said support and said upper portion of said coupler,
at least one second link pivotally coupled between said lower portion of said support and said lower portion of said coupler for stably supporting said coupler,
at least one first actuator means engaged between said first link and said second link and including a first end pivotally coupled to said lower portion of said support and a second end pivotally connected to said coupler for moving said coupler upward and downward,
a panel pivotally coupled to said upper portion of said coupler and rotatable about said upper portion of said coupler, said panel including a bottom surface having a middle portion, and
at least one second actuator means pivotally coupled between said middle portion of said bottom surface of said panel and said middle portion of said coupler for rotating said panel about said upper portion of said coupler.

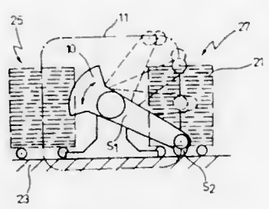
5,588,794
ROBOTIC GRIPPER
James R. Panyard, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 18, 1994, Ser. No. 276,574
Int. Cl.[6] B66C *1/10*
U.S. Cl. 414—729 **19 Claims**



8. A robotic gripper system for gripping a workpiece having a pair of spaced apart longitudinally extending contoured faces and at least two extending cylindrical bores, each cylindrical bore having an inner surface, and the contoured faces disposed at an angle in relation to the each other, the robotic gripper system comprising:
an industrial robot having a movable robotic arm;
a gripper base pivotally mounted on a distal end of said robotic arm;

a pair of spaced apart longitudinally extending stabilizing members, each affixed to said base, each of said stabilizing members having an engagement surface adapted to abuttingly engage a respective contoured face of said workpiece;
at least one pair of opposing clamping arms pivotally connected to said stabilizing members, each said clamping arms being pivotable from a first position wherein said clamping arm is disposed adjacent a respective cylindrical bore to a second position wherein said clamping arm abuttingly engages the inner surface of a respective one of said cylindrical bores;
a first biasing means connected to one of said pair of clamping arms by a first over the center type toggle link for moving said one clamping arm from said first position to said second position;
a second biasing means being connected to the other of said pair of clamping arms by a second over the center type toggle link for moving said other clamping arm from said first position to said second position; and
a control means in communication with the biasing means for selectively controlling actuation of said first and second biasing means, so that once the clamping arms are in the second position, each biasing means must be retracted to release the clamping arms, whereby clamping force is maintained by the over center clamping toggle link during power outages or in the event of a disconnected biasing means.

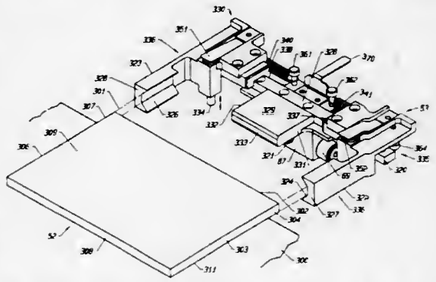
5,588,795
HANDLING APPARATUS
Helmut F. Jäger, Königsbach-Stein; Jürgen Peschina, Knittlingen, both of Germany, and Bernard Dietrich, Rixheim, France, assignors to Felsomat GmbH & Co KG, Konigsbach-Stein, Germany
Filed Jul. 14, 1994, Ser. No. 275,168
Claims priority, application Germany, Jul. 15, 1993, 43 23 736.3
Int. Cl.[6] B66C *1/00*
U.S. Cl. 414—733 **23 Claims**



1. Handling apparatus for moving an object along a U-shaped locus curve, said apparatus comprising:
an engaging element for engaging the object;
a machine frame;
a first rocker element disposed on said machine frame for rotation about a first horizontal axis;
a second rocker element disposed on one end of said first rocker element opposite said first horizontal axis for rotation about a second horizontal axis, said second rocker element carrying said engaging element at an end opposite said second horizontal axis; and
a first linkage coupling said first and second rocker elements for rotation with a fixed transmission ratio;
wherein said transmission ratio of said first linkage is substantially 1:4 to effect movement of said engaging element, as said first rocker element is rotated about said first horizontal axis, along the U-shaped locus curve having at least one horizontal section and one vertical section, and said horizontal and said vertical sections are largely straight;
wherein an arm length ratio (k) defined by a quotient of an arm length (a2) of said second rocker element—which is defined by an axial spacing between said second horizontal axis and a center axis of said engaging element—and an arm length (a1) of said first rocker element— which is defined by an axial spacing between said first and second horizontal axis—lies in the range between substantially 0.09 and 0.25 such that:

$$0.09<=k=a2/a1<=0.25.$$

5,588,796
APPARATUS AND METHOD FOR HANDLING INFORMATION STORAGE MEDIA
Gary C. Ricco, Redding; Michael D. Shannon, Sunnyvale, and Tyler R. Wilkins, Menlo Park, all of Calif., assignors to ATG Cygnet Inc., San Jose, Calif.
Filed Apr. 18, 1994, Ser. No. 229,406
Int. Cl.[6] B25J *15/00*
U.S. Cl. 414—741 **34 Claims**



10. A media handling apparatus for picking and flipping an informational media item including a parallelepiped shaped media item having no surface notches or protrusions to latch to, said apparatus comprising:
means for cradling and frictionally gripping and supporting said media item including said parallelepiped shaped media item having no surface notches or protrusions;
means for transporting said media item from a first location into a recessed region of said media handling apparatus;
said means for cradling and frictionally supporting being operable to cradle and support said media item even when said media item is positioned outside of said recessed region;
means for transporting said media item from said recessed region into a second location; and
means for flipping said media item retained within said recessed region of said apparatus.

5,588,797
IC TRAY HANDLING APPARATUS AND METHOD
Nathan R. Smith, Stillwater, Minn., assignor to Advantek, Inc., Minnetonka, Minn.
Filed Jul. 18, 1994, Ser. No. 276,336
Int. Cl.[6] B65G *59/06*
U.S. Cl. 414—797.5 **18 Claims**

1. An apparatus for handling trays accommodating microchips comprising: a generally horizontal table for supporting a plurality of trays holding microchips, rib means secured to the table for locating the trays on the table and guiding one tray along the table, upright post means mounted on the table engageable with the trays to locate a stack of trays on the table in a first position, tray handling means for lifting the stack of trays, except the bottom one tray, supported on the table, first means operable to move the one tray on the table from the first position to a second position, second means for removing microchips from the one tray and placing the microchips in a selected location, said first means being operable to move the one tray from the second position to a third position on the table when all of the microchips have been removed from the one tray, said tray handling means being operable to lower the

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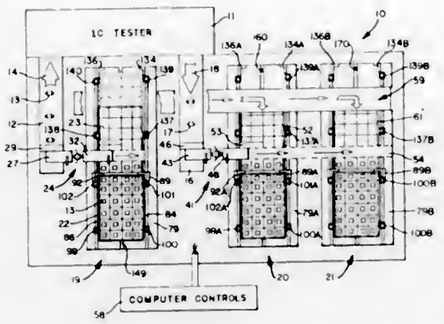


stack of trays on the table and subsequently raise the stacks of trays leaving a second bottom tray on the table, said first means being operable to move the second bottom tray from the first position to the second position so that microchips can be removed from the second bottom tray.

5,588,798

ROTATING MACHINE PART, IN PARTICULAR A ROTOR OF A CYCLOID SHIP'S PROPELLER

Werner Fork, Heidenheim, Germany, assignor to J.M. Voith GmbH, Germany

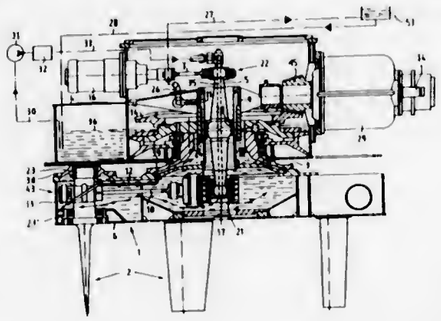
PCT No. PCT/EP94/03614, § 371 Date Jul. 5, 1995, § 102(e) Date Jul. 5, 1995, PCT Pub. No. WO95/12520, PCT Pub. Date May 11, 1995

PCT Filed Nov. 3, 1994, Ser. No. 481,329

Claims priority, application Germany, Nov. 5, 1993, 43 37 761.0

Int. Cl.[6] F04D *29/00*

U.S. Cl. 415—111 **14 Claims**



1. A rotating machine part having a base, an outer wall around the base, the rotating machine part defining a rotor having a rotation axis at the rotor axis, wherein the machine part is rotatable in a medium which is able to transmit heat away from the outer wall to a sufficient extent to produce a cooling effect on the rotor;

means toward the rotor axis for introducing a liquid heat transmission medium into the rotor and the rotor being shaped so as to permit the introduced transmission medium to move radially outward through the machine part;

a plurality of transmission medium return lines, each line having an inlet for the heat transmission medium to be returned and the inlet being arranged in the radially outer region of the rotor, the return lines being directed for delivering the heat transmission medium to the vicinity of the central axis of the rotor.

5,588,799

DIFFUSOR FOR A TURBO-MACHINE WITH OUTWARDLY CURVED GUIDED PLATE

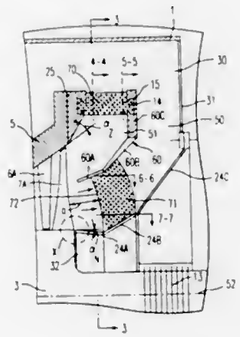
Franz Kreitmeier, Baden, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Jun. 7, 1995, Ser. No. 473,938

Claims priority, application Germany, Jun. 29, 1994, 44 22 700.0

Int. Cl.[6] F01D *1/02;* **F04D** *29/44*

U.S. Cl. 415—211.2 **12 Claims**



1. In an axial-flow turbo-machine having a fluid flow channel containing a plurality of rows of rotor blades past which a fluid may flow in a substantially axial flow direction to produce a fluid flow having a rotational flow component at a downstream end of said plurality of rotor blades in the flow direction, said channel having a channel height at a downstream-most row of said rotor blades, a diffusor positioned downstream of said rotor blades in the flow direction and comprising:

a radially outer diffusor ring having an upstream end forming a first kink angle with a radially outer wall of said fluid flow channel;

a radially inner diffusor ring having an upstream end forming a second kink angle with a radially inner wall of said fluid flow channel, a diffusor channel being defined between said inner and outer diffusor rings, said inner and outer diffusor rings being configured such that said diffusor channel has an axial inlet and a radial outlet;

a radially outwardly curved flow-guiding plate positioned in said diffusor channel, said flow-guiding plate subdividing said diffusor channel into inner and outer channels between a fluid flow inlet of said diffusor channel and a fluid flow outlet of said diffusor channel;

a plurality of radial-flow ribs positioned in said outer channel at a substantially radial fluid flow portion thereof; and

a plurality of diagonal-flow ribs positioned in said inner channel at a substantially diagonal fluid flow portion thereof, said radial and diagonal flow ribs comprising a mechanism substantially cancelling the rotational flow component of the fluid flow,

wherein said first and second kink angles are selected such that a total pressure profile over said channel height is substantially equalized.

5,588,800

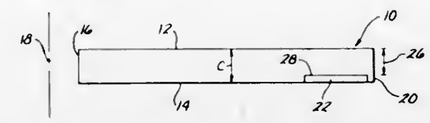
BLADE VORTEX INTERACTION NOISE REDUCTION TECHNIQUES FOR A ROTORCRAFT

Bruce D. Charles; Ahmed A. Hassan, both of Mesa; Hormoz Tadghighi, Gilbert; Ram D. JanakiRam, Mesa, all of Ariz., and Lakshmi N. Sankar, Atlanta, Ga., assignors to McDonnell Douglas Helicopter Co., Mesa, Ariz.

Filed May 31, 1994, Ser. No. 251,329

Int. Cl.[6] F01D *5/00*

U.S. Cl. 416—24 **17 Claims**



1. An active control device for reducing blade vortex-interaction (BVI) noise generated by a rotorcraft having a rotor blade including a tip end, a root end, a leading edge, and a trailing edge, said rotor blade being attached at said root end to a rotor hub on said rotorcraft and extending radially outwardly therefrom, having a radius R and a chord C, such that when said rotor hub is rotatably driven, said rotor blade rotates about said hub through a 360 degree azimuth, said active control device comprising:

a movable flap pivotally attached to said rotor blade trailing edge by a hinge oriented generally radially along said rotor blade, at least a portion of said flap being positioned near said rotor blade tip, in about the outboard 25% of the rotor blade radial length, said flap having a chord width within a range of approximately 0.25 C–0.35 C, along at least a portion of its radial length;

an actuator for deflecting and retracting the flap about said hinge;

wherein said flap is adapted to be actuated to a deflected position during rotation of said rotor blade through predetermined regions of said rotor azimuth, and is further adapted to be actuated to a retracted position through the remaining regions of said rotor azimuth, thereby functioning to reduce BVI noise during operation of said rotorcraft.

5,588,801

FLAP STOPS DEVICE WITH RETRACTABLE UPPER STOPS RING, AND ROTOR HEAD INCLUDING IT

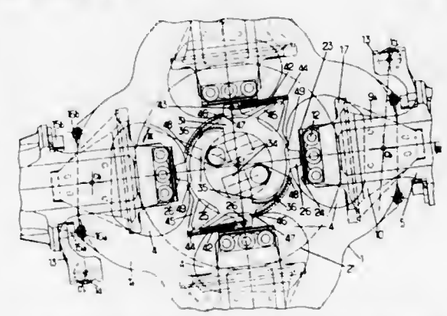
Sylvie J. Commelin, Carry le Rouet, and Jean J. Mondet, Pelissanne, both of France, assignors to Eurocopter France, Marignane, France

Filed Oct. 5, 1995, Ser. No. 539,692

Claims priority, application France, Oct. 12, 1994, 94 12168

Int. Cl.[6] B64C *27/51*

U.S. Cl. 416—46 **15 Claims**



1. In combination, a flap stops device for a rotorcraft and a main rotor, said main rotor comprising:

a plurality of blades, each blade being attached to a hub of the rotor by an attachment part, said attachment part being joined to the hub by means for holding and articulating;

said flap stops device comprising for each said blade, a corresponding upper stop mounted so as to move on the hub;

an elastic return means for returning said upper stop to a ground position, wherein each upper stop directly faces and has a clearance away from a stop track of an upper bearing shoe, said upper bearing shoe being mounted on said attachment part of a corresponding blade so as to limit upwards flapping of said blade by contacting said stop track against a corresponding upper stop at rotational speeds of the rotor within a range between zero and below a threshold corresponding to a speed which is sufficient to allow the rotor to be controlled using rotorcraft flight controls;

at least one flyweight mounted so that it can pivot on said hub about a pin which is substantially parallel to an axis of rotation of the rotor and mechanically joined to at least one upper stop so that at rotational speeds of the rotor which are greater than said threshold

each flyweight is moved away from said axis of rotation of the rotor by centrifugal force,

the upper stops are moved against said elastic return means into a flight position such that said upper stops no longer face said upper bearing shoes of the blades, said blades no longer being limited in terms of upwards flapping by the upper stops, and

said upper stops each project outwards from a rotary ring which is substantially coaxial with the hub, said ring being mounted so as to rotate about the axis of rotation of the rotor on an upper part of the hub, and each flyweight being mechanically joined to said ring by means for driving the ring in rotation about the axis of rotation of the rotor from the ground to the flight position of the upper stops when said flyweight is moved away from this axis by centrifugal force, and against the elastic return means which return the ring to the ground position of the upper stops and each flyweight towards the axis of rotation of the rotor.

5,588,802

Patent Not Issued For This Number

5,588,803

CENTRIFUGAL IMPELLER WITH SIMPLIFIED MANUFACTURE

Stephan M. Vetter, Lockport, and Mark J. Parisi, East Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1995, Ser. No. 566,101

Int. Cl.[6] F04D *29/28*

U.S. Cl. 416—186 R **1 Claim**

1. A centrifugal blower impeller, comprising,

a central hub having a center axis and an annular rim,

a regularly spaced series of substantially identical impeller blades extending axially upwardly from said hub rim, each blade having a substantially unsupported tip and a radial width sufficient to require external support to said blade tip to prevent excessive flexure in use, each blade tip further having a pair of radially separated, axially opening notches therein, each notch of each pair lying on a common diameter with the remaining blade tip notches,

a circular band surrounding and integrally molded to said blade tips, said circular band being located entirely radially outboard of said hub rim, and,

an annular locking ring having a radial width comparable to said blade tips, said ring having a pair of generally circular channels, each lying on a diameter equal to said blade tip notches and having a cross sectional shape matching the shape of said

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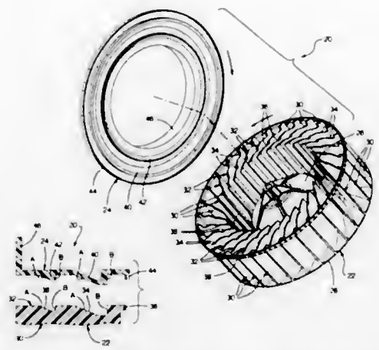


notches, said locking ring also having a cylindrical flange the inner surface of which closely matches the outer surface of said band,

whereby said locking ring is assembled to said blades by aligning and axially inserting said cylindrical flange over said band as said channels are concurrently axially inserted into said blade tip notches, thereby completing said impeller and preventing said blade tips from flexing excessively during impeller rotation.

5,588,804

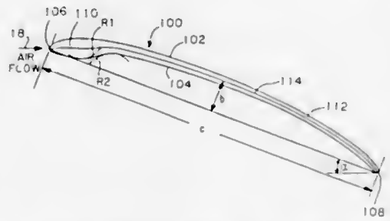
HIGH-LIFT AIRFOIL WITH BULBOUS LEADING EDGE

Michael J. Neely, Dayton, and John R. Savage, Kettering, both of Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Filed Nov. 18, 1994, Ser. No. 342,358

Int. Cl.[6] F01D *5/14*

U.S. Cl. 416—223 R **17 Claims**



1. An airfoil defining the shape of the blades of a vehicle engine-cooling fan assembly and comprising:

an unpointed leading edge;

a rounded bulbous nose section adjacent said leading edge;

a trailing edge;

a continuously curved pressure surface extending smoothly, without discontinuity, and without a planar portion from said nose section to said trailing edge;

a continuously curved suction surface extending smoothly and without discontinuity from said nose section to said trailing edge; and

a thin, highly cambered aft section formed adjacent said trailing edge and between said pressure surface and said suction surface, said aft section having a location of maximum camber;

said nose section having a thickness which is greater than the thickness of said airfoil between said pressure surface and said suction surface and said nose section blending smoothly into said pressure surface via a first blend radius and a second blend radius approximately equal to said first blend radius and into said suction surface, said first blend radius forming a convex surface extending from said nose section adjacent said leading edge and said second radius forming a concave surface extending from said convex surface to said pressure surface of said airfoil.

5,588,805

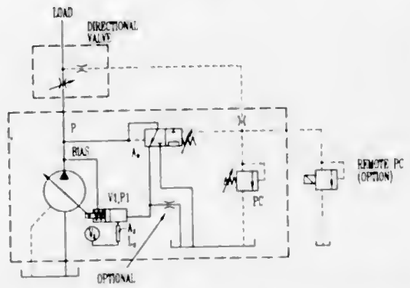
VIBRATION AND PRESSURE ATTENUATOR FOR HYDRAULIC UNITS

Kerry G. Geringer, Ames, Iowa, assignor to Sauer Inc., Ames, Iowa

Filed Aug. 28, 1995, Ser. No. 520,083

Int. Cl.[6] F04B *1/26*

U.S. Cl. 417—53 **12 Claims**



1. A method of attenuating vibration and pressure within a a hydraulic unit having a swashplate therein connected to a servo piston disposed in a servo piston cylinder bore fluidly connected to the hydraulic unit, the hydraulic unit displacing pressurized fluid having a periodic component therein exerted at a troublesome frequency on the fluid in the servo piston cylinder bore due to vibrational movement of the swashplate, the method comprising:

connecting the servo piston cylinder bore to an oscillator tuned to the troublesome frequency, the oscillator having a substantially rigid inertial portion and a hydraulic spring portion fluidly connected to the inertial portion;

allowing pressurized fluid to enter the inertial portion and thence enter into the hydraulic spring portion;

compressing the pressurized fluid in the hydraulic spring portion to cause a phase change of the periodic component and introduce a phase shifted second periodic component into the pressurized fluid in the hydraulic spring portion whereby the second periodic component will transfer back through the pressurized fluid in the inertial portion to the servo piston cylinder bore whereupon the servo piston will transmit the second periodic component to the swashplate to attenuate the vibrational movement thereof.

5,588,806

LIQUID RING MACHINE AND PROCESS FOR OPERATING IT

Peter Trimborn, Feucht, and Kurt-Willy Mugele, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE94/00131, § 371 Date Aug. 15, 1995, § 102(e) Date Aug. 15, 1995, PCT Pub. No. WO94/19610, PCT Pub. Date Sep. 1, 1994

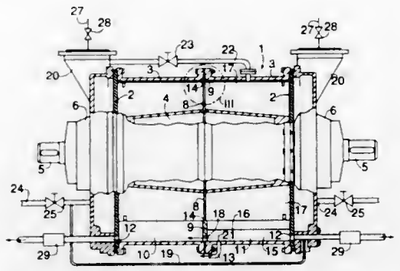
PCT Filed Feb. 9, 1994, Ser. No. 505,228

Claims priority, application Germany, Feb. 22, 1993, 43 05 424.2

Int. Cl.[6] F04B *47/12*

U.S. Cl. 417—68 **30 Claims**

1. A method for operating a liquid ring machine comprising the steps of:



providing a working chamber within the liquid ring machine, the working chamber having an apex in the geodetic upper area and a rotatable impeller, wherein the working chamber is divided into at least two partial working chambers;

providing a supply of operating liquid;

separating at least one partial working chamber from the supply of operating liquid;

blocking the partial working chamber on either the suction side or the discharge side or both; and

draining the supply of operating liquid from the at least one partial working chamber so that the operating liquid does not contact the rotating impeller in the at least one partial working chamber, while another partial working chamber remains in operation so that the operating liquid does contact the rotating impeller in the another partial working chamber.

5,588,807

SWASH PLATE TYPE VARIABLE DISPLACEMENT COMPRESSOR

Kazuya Kimura; Hiroaki Kayukawa; Toru Takeichi, and Osamu Hiramatsu, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

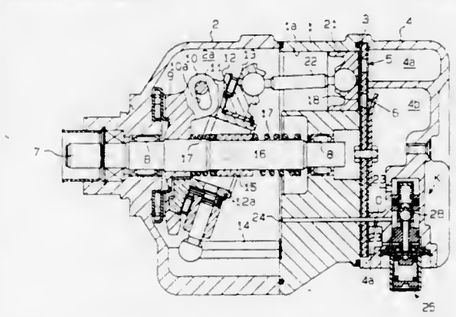
PCT No. PCT/JP93/01655, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO94/11636, PCT Pub. Date May 26, 1994

PCT Filed Nov. 12, 1993, Ser. No. 244,448

Claims priority, application Japan, Nov. 12, 1992, 4-302593

Int. Cl.[6] F04B *1/29*

U.S. Cl. 417—222.2 **8 Claims**



1. A swash plate type variable displacement compressor in which a variably inclined swash plate is located in a crank chamber within a housing, the inclination angle of said swash plate being adjustable in accordance with the pressure difference between said crank chamber and a gas suction chamber, and a piston is provided for reciprocation with a stroke related to the inclination angle of said swash plate for compressing gas supplied from said suction chamber to a compression chamber, whereby the volume of gas discharged from a gas discharge chamber is controlled, said compressor comprising:

a communication passage in said housing independent of said crank chamber for connecting said gas discharge chamber to said gas suction chamber without passing through said crank chamber;

a branch passage branching from said communication passage and communicating with said crank chamber;

valve means, disposed in said communication passage between said gas discharge chamber and a point where said branch passage branches from said communication passage, for selectively opening and closing said communication passage to alter the pressure in said crank chamber; and

a restriction, provided downstream of said point where said branch passage branches from said communication passage, for throttling the flow of gas from said gas discharge chamber to said gas suction chamber.

5,588,808

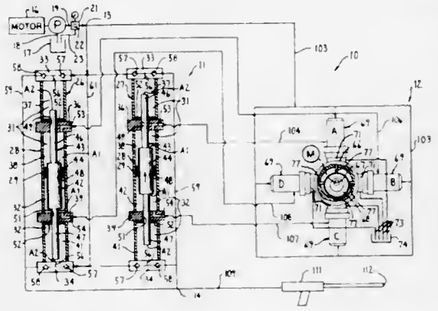
PUMP PRESSURE MULTIPLIER

Gerard J. De Santis, Battle Creek, Mich., assignor to Hytech Pumps International, Inc., Bedford, Mich.

Filed Dec. 8, 1994, Ser. No. 352,316

Int. Cl.[6] F04B *35/02*

U.S. Cl. 417—225 **9 Claims**



1. A device for elevating a pressure acting on a liquid, comprising:

a first pressure elevating means for supplying a liquid under a first positive pressure and at a selected volume of liquid per unit of time flow rate to a liquid inlet port;

a second liquid pressure elevating means for receiving the liquid under the first positive pressure and at the selected volume of liquid per unit of time flow rate from the inlet port and supplying the liquid under a second positive pressure substantially greater than the first pressure and at said selected volume of liquid per unit of time flow rate to an outlet port and a liquid utilizing load connected thereto, said second pressure being sufficiently high enough to cause the liquid to become substantially compressed to thereby result in said second pressure to vary during intervals of time that the liquid is being compressed; and

control means for accommodating the compressibility of the liquid so as to maintain a substantially constant second pressure.

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5,588,809

METERING PUMP WITH A VENT VALVE

Joachim Klein, Vachendorf, and Herbert Hunklinger, Siegsdorf, both of Germany, assignors to Lang Apparatebau GmbH, Siegsdorf, Germany

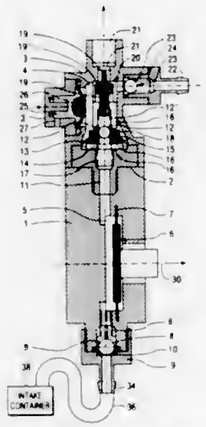
PCT No. PCT/EP93/03333, § 371 Date Aug. 7, 1995, § 102(e) Date Aug. 7, 1995, PCT Pub. No. WO94/13956, PCT Pub. Date Jun. 23, 1994

PCT Filed Nov. 27, 1993, Ser. No. 448,516

Claims priority, application Germany, Dec. 5, 1992, 42 41 030.4

Int. Cl.[6] F04B *21/00*

U.S. Cl. 417—283 **15 Claims**



1. A metering pump for measuring the amount of liquids being delivered to an intake container, comprising:

an intake line at one end for connection to an intake container;

a suction valve installed in said intake line;

a pump chamber have one end opening into said intake line for series connection therewith, and another end;

a pump element mounted in said pump chamber for alternately changing the displacement volume of said pump chamber;

a non-return valve;

a valve chamber having one end separated from and coupled to said pump chamber via said non-return valve located therebetween;

a first displaceable wall mounted between said nonreturn valve and said pump chamber;

a vent valve mounted in said valve chamber, said vent valve being controlled by said first displaceable wall, whereby said vent valve opens during a suction stroke of said pump element, and closes during a compression stroke thereof;

a metering line connector having a liquid flow path opening into said valve chamber proximate said vent valve; and

a pressure valve mounted in the liquid flow path of said metering line connector, and responsive to the pressure in said valve chamber exceeding a given value for opening to permit liquid to flow therebetween.

5,588,810

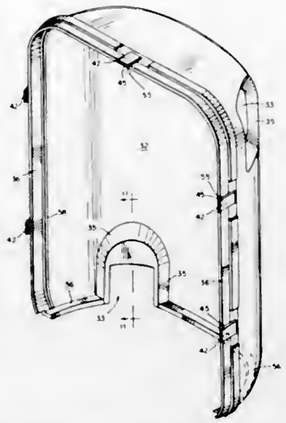
LOW NOISE REFRIGERANT COMPRESSOR

Michael A. DiFlora; Prakash N. Pandeva, both of Bristol, Tenn.; Christopher S. Robinson, Abingdon, Va., and Philip C. Wagner, Bristol, Tenn., assignors to Bristol Compressors, Inc., Bristol, Va.

Filed Sep. 1, 1995, Ser. No. 522,793

Int. Cl.[6] H02K *5/04*

U.S. Cl. 417—312 **8 Claims**



1. A sound barrier cover for a compressor unit, said unit having a housing comprising a substantially continuous wall having a longitudinal axis and a radial axis and containing a compressor and being provided with a plurality of porting means mounted through said wall, said barrier cover comprising first and second shell sections configured to lie close to said housing and substantially envelope said housing, said shell sections being configured to provide two substantially longitudinally oriented halves each having sound absorbing material affixed to its inner surface, said halves having perimeters with portions thereof formed with mating tongue and groove means, cooperating components of snap-fasteners on said halves in close proximity to the perimeters thereof, said snap-fasteners being adapted to hold said perimeters in contact with each other and with said sound absorbing material in resilient contact with said housing wall and exerting radially outward force on said barrier cover.

5,588,811

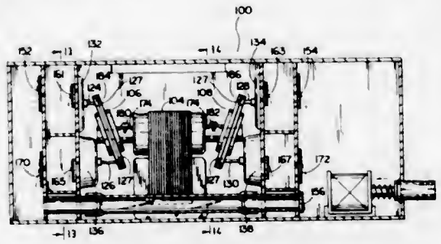
AIR BED DIAPHRAGM PUMP

Gerald H. Price, Burlington, Canada, assignor to Price Manufacturing, Inc., Burlington, Canada

Filed Jul. 14, 1994, Ser. No. 275,125

Int. Cl.[6] F04B *1/28;39/10*

U.S. Cl. 417—350 **11 Claims**



1. A diaphragm pump comprised of a shaft, means for rotating said shaft at a speed of less than 3,300 revolutions per minute, a first flange assembly connected to said shaft such that the axis of rotation of said shaft forms an angle other than 90 degrees with the axis of rotation of said first flange assembly, a second flange assembly connected to said shaft such that the axis of rotation of said shaft forms an angle other than 90 degrees with the axis of rotation of said second flange assembly, a first connecting rod connected to a first diaphragm, a second connecting rod connected to a second diaphragm, a third connecting rod connected to a third diaphragm, a fourth connecting rod connected to a fourth diaphragm, and means for converting rotary motion of said flange assemblies into reciprocating linear motion of both said first connecting rod, said second connecting rod, said third connecting rod, and said fourth connecting rod wherein:

(a) as said first connecting rod is moved in a first direction at a first rate of travel, said second connecting rod is simultaneously moved in a second linear direction at a second rate of travel, wherein said second rate of travel is equal to said first rate of travel, and said second linear direction is the opposite of said first linear direction, and

(b) as said third connecting rod is moved in a third direction at a third rate of travel, said fourth connecting rod is simultaneously moved in a fourth linear direction at a fourth rate of travel, wherein said fourth rate of travel is equal to said third rate of travel, and said fourth linear direction is the opposite of said third linear direction;

(c) said first flange assembly is connected to each of said first connecting rod and said second connecting rod by means of a ball and socket assembly;

(d) said second flange assembly is connected to each of said third connecting rod and said fourth connecting rod by means of a ball and socket assembly;

(e) said first flange assembly is comprised of a first inner flange disposed within a first outer flange and separated from said first outer flange by first bearings; and

(f) said second flange assembly is comprised of a second inner flange disposed within a second outer flange and separated from said second outer flange by second bearings; and

(g) said first diaphragm communicates with a first inlet and outlet valve pair, said second diaphragm communicates with a second inlet and outlet valve pair, said third diaphragm communicates with a third inlet and outlet valve pair, and said fourth diaphragm communicates with a fourth inlet and outlet valve pair.

5,588,812

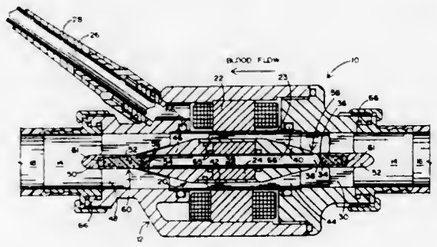
IMPLANTABLE ELECTRIC AXIAL-FLOW BLOOD PUMP

Lynn P. Taylor, Camino; Pieter W. J. C. le Blanc, Pollock Pines; Kenneth C. Butler, Carmichael, and Timothy R. Maher, Orangevale, all of Calif., assignors to Nimbus, Inc., Rancho Cordova, Calif.

Filed Apr. 19, 1995, Ser. No. 424,165

Int. Cl.[6] F04B *17/03*

U.S. Cl. 417—356 **17 Claims**



1. An implantable blood pump comprising:

a) a cylindrical blood conduit;

b) a motor stator surrounding said blood conduit;

c) a pump rotor having inlet and outlet ends and containing a motor rotor for motive interaction with said motor stator, said pump rotor being arranged to rotate in said blood conduit;

d) inlet stator blades disposed in said blood conduit, said inlet stator blades supporting an inlet hub;

e) outlet stator blades disposed in said blood conduit, said outlet stator blades supporting an outlet hub; and

f) a ball-and-cup structure interposed between each of said inlet and outlet ends of said pump rotor and the corresponding one of said hubs for supporting said rotor, said ball-and-cup structures being washed by the blood flow through said blood conduit;

g) said ball-and-cup structure having a substantially smaller diameter than said, pump rotor and presenting to said blood flow a substantially continuous surface through which substantially no blood can penetrate between said ball and cup.

5,588,813

FLUID MOTOR DRIVEN PUMP ARRANGEMENT HAVING MOTIVE FLUID EXHAUST INTO THE PUMP CHAMBER

Jorgen Berke-Jorgensen, Gramvej 76, Fruering, DK-8660, Skanderborg, Denmark

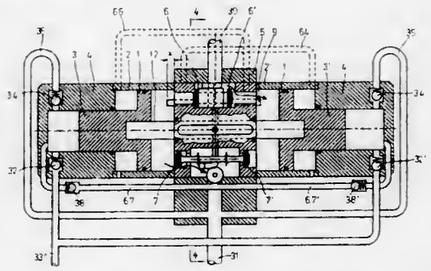
PCT No. PCT/DK93/00151, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO93/22556, PCT Pub. Date Nov. 11, 1993

PCT Filed May 5, 1993, Ser. No. 331,660

Claims priority, application Denmark, May 7, 1992, 0600/92

Int. Cl.[6] F04B *9/115*

U.S. Cl. 417—391 **9 Claims**



1. Dosing arrangement for the dosing of at least a first liquid medium A into a second liquid medium B and which comprises a piston type liquid motor which is driven by the second liquid medium B and consists of two mutually connected motor pistons (**1**, **1'**) on a common piston rod (**12**) each motor piston traveling in its own motor cylinder (**2**, **2'**), and having a length of stroke, motor inlet valves (**6**, **6'**) and motor outlet valves (**7**, **7'**) for delivery and discharge of the second liquid B to and from the motor cylinders (**2**, **2'**) and at least one dosing pump, for the first liquid A, the at least one dosing pump being embodied as a piston pump consisting of two pump pistons (**3**, **3'**) traveling each in its own pump cylinder (**4**, **4'**), which are positioned outward from, in continuation of and coaxially with the motor cylinders (**2**, **2'**) and which are mechanically connected to the motor pistons (**1**, **1'**), motor outlet valves for delivery and discharge of the first liquid medium A to and from the pump cylinders (**4**, **4'**), pipe connections for supply of the first liquid medium A from the dosing pumps to a discharge pipe from the liquid motor, and means for regulation of the proportion of mix, the dosing arrangement comprising the motor pistons and the pump pistons (**3**, **1**, **3'**, **1'**) being mutually permanently connected and attached to a central body (**5**), the one of the motor cylinders and one of the pump cylinders (**2**, **4**, **2'**, and **4'**) being positioned on opposite sides of the central body from the other of the motor cylinders and the other of the pump cylinders, the central body having a width which is greater than the length of stroke of the motor piston (**1**, **1'**), in which the motor inlet valves (**6**, **6'**) for delivery and the motor outlet valves (**7**, **7'**) for discharge of the second liquid B to and from the motor cylinders (**2**, **2'**) are built in, the motor inlet valves (**6**, **6'**) being embodied as seat valves, which are mutually connected by an inlet valve rod (**8**) being moved in a direction parallel with the direction of travel of the motor pistons (**1**, **1'**), and which in their extreme positions close a delivery opening (**6a**, **6a'**) to the motor cylinders (**2**, **2'**), respectively, the motor inlet valves (**6**, **6'**) by means of the inlet valve rod (**8**) being instantaneously changed from one extreme position to the other by means of a spring mechanism coupled to a push rod (**9**), said push rod (**9**) being displacably embedded in the central body (**5**) so that the push rod can move in a direction parallel with the inlet valve rod (**8**), being placed and having a length so that when one of the

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motor inlet valves (6, 6') is closed, the push rod protrudes a short distance (X) into the motor cylinder, respectively (2, 2') and is displaced by the motor piston, (1, 1') when the latter travels towards its bottom dead center towards the central body 5, the motor outlet valves (7, 7') being embodied as seat valves which are mutually connected by an outlet valve rod (10), which is parallel with the inlet valve rod (8) being moved in a direction which is parallel with the direction of movement of the motor inlet valves (6, 6') and in their extreme positions said motor inlet valves (6, 6') can close the discharge openings (11, 11') from the motor cylinders (2, 2'), respectively, and that the movement of the motor outlet valves (7, 7') are firmly coupled to the movement of the motor inlet valves (6, 6'), the central body (5) being hollow and filled with the second liquid medium B, the central body (5) incorporating an opening/closing arrangement which, in correspondence with the movement of a piston rod (12), delivers a desired and variable volume of the second liquid medium B from the central body (5) to the pump cylinder (4 4'), which is under suction pressure.

5,588,814
ELECTRONIC SWITCHING FAN ASSEMBLY FOR A VEHICLE

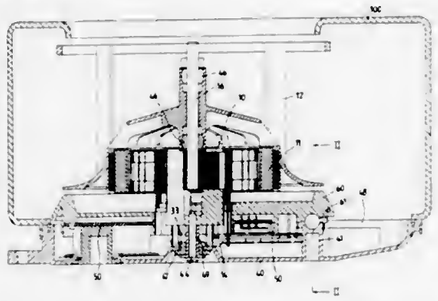
Pietro De Filippis, Monza; Ernesto Quartero, and Alberto Petrone, both of Collegno, all of Italy, assignors to Bitron S.P.A., Italy

Filed May 11, 1995, Ser. No. 439,360

Claims priority, application Italy, May 12, 1994, T094A0386

Int. Cl.[6] F04B *35/04*

U.S. Cl. 417—423.7 **25 Claims**



1. An electric fan assembly for a vehicle compartment, comprising:

an electric motor including a rotor to which a fan wheel is secured for rotation and a stator having a stack of laminations, the stator being mounted to a die-cast bearing fitted in an open box in communication with a scroll from which the fan wheel sucks air to be sent to the vehicle compartment;

a card including a printed circuit for determining operation of said electric motor;

wherein the bearing has two main opposite faces, one of which is a lower face and the other of which is an upper face, for mounting the stator and defining a seat for the assembly formed by the card;

a plurality of MOSs projecting from edges of the card, said MOSs being substantially coplanar to said card;

said seat having a depth dimensioned to receive a layer of solidifying resin covering and protecting the printed circuit and connections of the printed circuit;

said bearing having a plurality of central channels axially disposed along a cross-sectional axis of the die-cast bearing, the central channels providing electric connections between stator winding leads and a plurality of electric contacts located on the card proximate to at least one opening obtained in said card at said central channels; and

a plurality of axial fins extending from the upper face of said bearing for engaging the stator axially and radially.

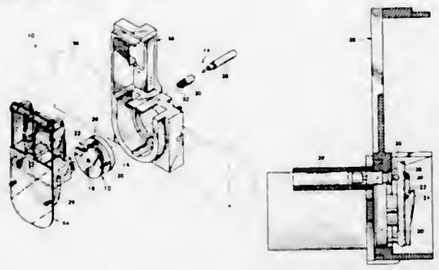
5,588,815
SURGICAL CASSETTE LOADING AND UNLOADING SYSTEM

Richard L. Zaleski, II, San Juan Capistrano, Calif., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Nov. 15, 1995, Ser. No. 559,016

Int. Cl.[6] F04B *43/08*

U.S. Cl. 417—477.2 **2 Claims**



1. A system for loading and unloading a surgical cassette having a peristaltic pump tube from a cassette receiving portion of a surgical console, comprising:

a) a peristaltic pump roller head having a flared and beveled notch, the roller head being located in the cassette receiving portion of the surgical console; and

b) an extendable cylinder within the cassette receiving portion of the surgical console aligned so as to engage the peristaltic pump tube.

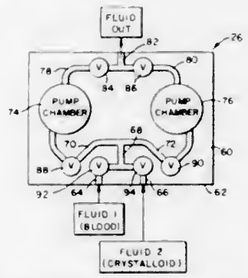
5,588,816
DISPOSABLE CASSETTE FOR CARDIOPLEGIA DELIVERY SYSTEM

Martyn Abbott, Richardson, and Thomas C. Thompson, McKinney, both of Tex., assignors to Quest Medical, Inc., Allen, Tex.

Division of Ser. No. 67,683, May 26, 1993, Pat. No. 5,385,540. This application Jan. 31, 1995, Ser. No. 382,299

Int. Cl.[6] F04B *23/00;43/02*

U.S. Cl. 417—479 **6 Claims**



1. A pump cassette usable with a clinical pump for delivering a plurality of fluids comprising:

(a) a first valved cassette inlet for receiving a first fluid;

(b) a second valved cassette inlet for receiving a second fluid;

(c) a common fluid outlet for conveying a combined flow of said first and second fluids;

(d) a common inlet path communicating with said first and second valved cassette inlets;

(e) separate first and second valved pump flow paths communicating with said common inlet path;

(f) first and second pump chambers communicating with, respectively, said first and second valved pump flow paths, each of said chambers having a deformable wall for varying the chamber volume; and

(g) first and second valved outlet paths communicating with said common fluid outlet.

5,588,817
PRESSURE-MEDIUM-TRAVERSED PISTON OF A RECIPROCATING PISTON PUMP

Wilhelm Zirps, Hemmingen; Wolfgang Schuller, Sachsenheim, and Martin Urban, Blaichach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

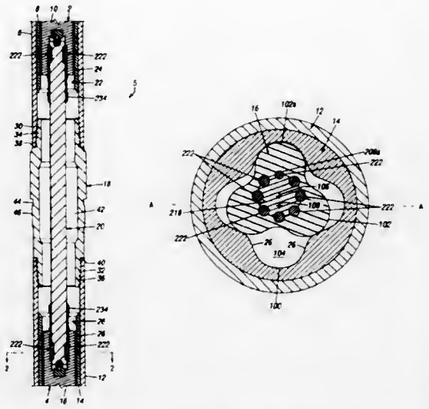
PCT No. PCT/DE94/00651, § 371 Date Jul. 17, 1995, § 102(e) Date Jul. 17, 1995, PCT Pub. No. WO95/00759, PCT Pub. Date Jan. 5, 1995

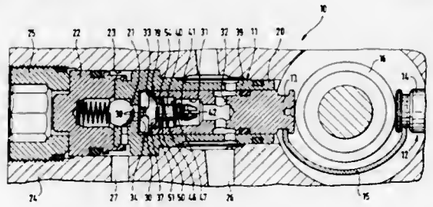
PCT Filed Jun. 10, 1994, Ser. No. 491,981

Claims priority, application Germany, Jun. 24, 1993, 43 20 902.5

Int. Cl.[6] F04B *21/04*

U.S. Cl. 417—549 **8 Claims**





1. A piston (13) of a reciprocating piston pump (10) through which a pressure medium flows for slip-regulated braking systems of motor vehicles, having the following features:

said piston (13) is provided with an inlet valve (19),

the piston (13) exhibits a longitudinal bore (31) connected to a pressure-medium supply (26),

in the region of a piston face (30), the longitudinal bore (31) opens out into a valve seat (33) of the inlet valve (19),

a valve disk (37) of a closing member (34) of the inlet valve (19) is supported against the valve seat (33),

a stem (40) of the closing member (34) emanates from the valve disk (37) and emanates into the longitudinal bore (31) of the piston (13),

a biased closing spring (46) of the inlet valve (19) is received on the stem (40) and upon a flank, facing away from the valve seat (33), of a shoulder of the longitudinal bore (31), which shoulder is located on the valve seat side,

the stem (40) of the closing member (34) is embraced by an at least approximately frustoconical helical compression spring acting as a closing spring (46),

the closing spring (46) is held, with an end segment (47) of smaller diameter, non-twistably against the stem (40), and

the shoulder of the longitudinal bore (31) exhibits at least one cross-sectional alteration for a screw-like action upon the end segment (40) of larger diameter of the closing spring (46).

5,588,818
ROTOR-TO-ROTOR COUPLING

Mitchell J. Houmand, Richmond, and James E. Kraus, Kingwood, both of Tex., assignors to Horizon Directional Systems, Inc., Houston, Tex.

Filed Apr. 20, 1995, Ser. No. 433,544

Int. Cl.[6] F03C *2/08;* **F16D** *1/08*

U.S. Cl. 418—5 **20 Claims**

1. A rotor to rotor coupling comprising:

a rotor end having at least two, spaced apart, internal longitudinal grooves in a cavity adjacent the rotor end;

a connecting rod having at least two correspondingly spaced longitudinal, external grooves adjacent one end of the rod, wherein the rod end containing the external grooves is sized to be telescopically received within the rotor end containing the internal grooves such that the external and internal grooves form at least two spaced chambers;

at least two pins sized to fit within the spaced chambers; and

means for releasably securing the rotor end to the rod end with the pins captured within the spaced chambers wherein the releasably securing means is sized to fit about the connecting rod and includes a threaded connector having at one end external threads for mating with internal threads within the rotor end cavity to contain the captured pins within the chambers.

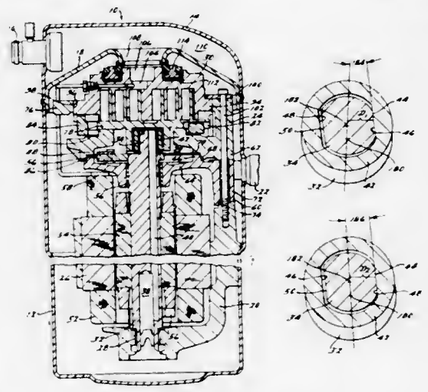
5,588,819
COMPLIANT DRIVE FOR SCROLL MACHINE

Frank S. Wallis, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Jun. 16, 1995, Ser. No. 490,906

Int. Cl.[6] F04C *18/04*

U.S. Cl. 418—39 **39 Claims**



1. A motor-compressor assembly comprising:

a shell;

first and second scroll members disposed in said shell, each of said scroll members having a spiral wrap thereon, said scroll members facing one another with said wraps inter-meshed with one another so that orbiting movement of said first scroll member with respect to said second scroll member will cause said wraps to create pockets of progressively decreasing volume towards the center of said scrolls;

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a crankshaft defining a crankshaft axis drivingly engaging said first scroll member to cause said orbiting movement of said first scroll member, said crankshaft including a crank pin having a flat driving surface;

a motor disposed in said shell and connected to said crankshaft to power same; and

a drive bushing defining a bushing axis and having first and second surfaces capable of being driven by said flat driving surface, said bushing being disposed between said crank pin and said first scroll member, said drive bushing and said crankshaft forming a drive angle defined as the angle between said flat driving surface and a line connecting said crankshaft axis and said bushing axis, said drive bushing being selectively assembled between a first position wherein said bushing axis is located a first distance from said flat driving surface when said flat driving surface is in engagement with said first bushing surface such that said drive angle produces a first radial flank load component due to said motor powering said crankshaft in a forward direction and a second position wherein said bushing axis is located a second distance from said flat driving surface when said flat driving surface is in engagement with said second bushing surface such that said drive angle produces a second radial flank load component due to said motor powering said crankshaft in said forward direction, said first distance being different from said second distance such that said second radial flank load is different than said first radial flank load.

5,588,820

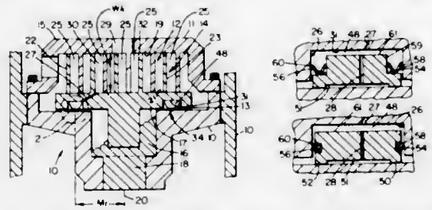
SCROLL COMPRESSOR HAVING AN AXIAL COMPLIANCE PRESSURE CHAMBER

Joe T. Hill, Bristol, Va.; Gene M. Fields, and John R. Williams, both of Bristol, Tenn., assignors to Bristol Compressors, Inc., Bristol, Va.

Filed Feb. 21, 1995, Ser. No. 391,733

Int. Cl.[6] F04C *18/04;27/00*

U.S. Cl. 418—55.4 **5 Claims**



1. A scroll compressor having a housing means, a non-orbiting scroll fixed in position angularly, radially and axially on the compressor housing means, an orbiting scroll nested with said non-orbiting scroll, each of said scrolls having base means formed with a free side and a pressure side and a wrap extending outwardly from said pressure side, said orbiting scroll being mounted on an eccentric of a compressor crankshaft for orbital motion about the longitudinal axis of the compressor to produce a pressure continuum between the wraps and base means of said scrolls, the free side of said base means of said orbiting scroll having an overall substantially annular planar configuration with annular groove means provided therein and formed with side and top wall means and being juxtaposed a substantially annular planar sealing surface formed on said housing means, passage means formed through said base means of said orbiting scroll and placing said groove means in fluid communication with an intermediate pressure section of said pressure continuum for providing an axial compliance force against said top wall means of said groove means for urging said orbiting scroll axially toward said non-orbiting scroll to bring the wrap tips of each said scroll toward sealing engagement with the adjacent base means of the other scroll, annular seal means in said groove means having an annular web means provided with a substantially planar contact side positioned in sliding, sealing contact with said sealing surface of said housing means, and further having annular, elastomeric, side sealing components slidingly sealed against the side wall means of said groove means to provide axial compliance pressure chamber means which is sealed from ambient pressures, wherein said seal means comprises annular ring means which is axially slidably mounted in said groove means, annular shoulder means on the inner and outer peripheries of said ring means, and annular, elastomeric seal components sealingly contacting and being supported on said shoulder means and sealingly contacting the walls of said groove means to provide said axial compliance pressure chamber means, and wherein annular recess means is formed in a radially central portion of said contact side of said web means for reducing the contact area thereof, and aperture means is provided through said web means and placing said recess means in fluid communication with said chamber means for reducing the total force which is exerted on said web means and which urges it against said sealing surface on said housing means.

5,588,821

VACUUM PUMP WITH PLANETARY GEAR ACCELERATOR

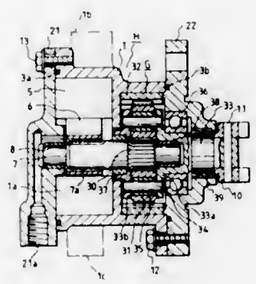
Takashi Kinoshita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1995, Ser. No. 451,428

Claims priority, application Japan, Nov. 4, 1994, 6-271452

Int. Cl.[6] F04C *18/344;25/02*

U.S. Cl. 418—259 **16 Claims**



1. A vacuum displacement pump for use in a servo assisted brake or actuator in an automobile, said vacuum displacement pump comprising:

a housing having a pump chamber;

an input shaft for providing a rotational force to said vacuum pump;

a rotor shaft connected to said input shaft and receiving a rotational force therefrom;

a rotor eccentrically mounted in said pump chamber and connected to said rotor shaft and receiving a rotational force therefrom;

a pump chamber assembly comprising:

an inlet for permitting entrance of a gas into said pump chamber;

an outlet for expelling said gas from said pump chamber;

a plurality of vanes, each vane slidably disposed in a groove of said rotor, wherein a suction is created in said pump chamber resulting from movement of said vanes due to a force created by the rotation of said rotor;

a planetary gear device comprising:

a sun gear located on said rotor shaft;

a plurality of planetary gears connected to said input shaft and engaging said sun gear;

a ring gear which engages said planetary gears, wherein said planetary gear device has a gear ratio which is set so that the rotation of said rotor is accelerated relative to the rotation of said input shaft.

5,588,822

FLAME TRAP FOR USE IN A PULSE COMBUSTOR

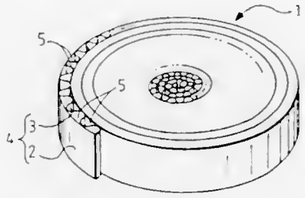
Tsuneyasu Hayakawa, and Makoto Kimura, both of Aichi, Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 19, 1995, Ser. No. 424,808

Claims priority, application Japan, Jul. 1, 1994, 6-173750

Int. Cl.[6] F23C *11/04*

U.S. Cl. 431—1 **2 Claims**



1. A flame trap and pulse combustor combination in which a mixture of air and fuel gas is supplied into a combustion chamber and subjected to pulse combustion, said flame trap comprising:

a first metal foil tape;

a second metal foil tape that is welded to one side of said first metal foil tape in such a manner that said second metal foil tape is corrugated so as to define cells between said first and second metal tapes;

said first and second metal foil being spirally wound;

wherein each of said cells in said flame trap is 2.25 mm^2 or less in aperture area, and

a total numerical aperture of said flame trap is 75% or more.

5,588,823

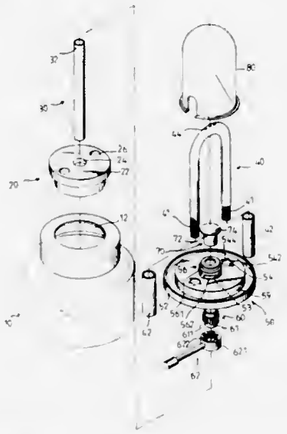
ALCOHOL LAMP

Jung-Wuan Wu, 7F-2, No. 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan

Filed Nov. 13, 1995, Ser. No. 556,411

Int. Cl.[6] F23D *11/44*

U.S. Cl. 431—241 **4 Claims**



1. An alcohol lamp comprising:

a container for containing alcohol having a less diameter protrudent opening projected upward from the top thereof;

a cap member fitted to said opening having a large diameter upper portion fitted to a rim of said opening, a first thru hole at the center and a pair of second thru holes adjacent a circumference of the upper surface;

a cover fitted to said cap member having a large diameter flange of U-shaped section extended outward from a circumferential edge of said cap, a central hole in registry with the first thru hole of said cap member, a hollow protrudent member projected upward from the central hole for defining a circular receiving space therein including a hole aligned with the central hole and a pair of retaining holes made in registry with the second thru holes of said cap member;

a heating pipe inserted through the hole in said protrudent member and the central hole of said cover and the first thru hole of said cap member having a pair of nozzles symmetrically arranged on an upper periphery and a sleeve member telescoped on the top thereof, said sleeve member having a pair of openings on lateral peripheries made in registry with the nozzles of said heating pipe and a large diameter flange on the top thereof;

an adjustment device disposed within the hollow protrudent member of said cover and fixedly wrapped on said heating pipe at an appropriate position having an annular ring of splined outer periphery meshed with a splined inner periphery of a circular head of a lever means which has a lever connected to the circular head and exposed to outside of the hollow protrudent member;

a U-shaped tubular member including a wick insert through the retaining holes of said cover and the second thru holes of said cap, said U-shaped tubular member having a plurality of egress holes on the top, a plurality of separately arranged threads stuffed into a lower portion of predetermined length and a pair of sleeves sleeved on the lower portion thereof.

5,588,824

INJECTION NOZZLE

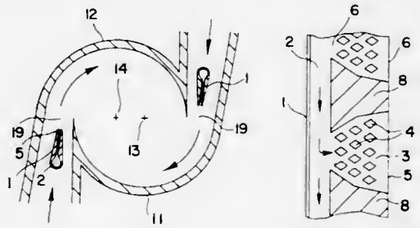
Robin T. D. McMillan, Untersiggenthal, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Nov. 2, 1995, Ser. No. 552,121

Claims priority, application Germany, Dec. 19, 1994, 44 45 279.9

Int. Cl.[6] F23Q *9/08*

U.S. Cl. 431—285 **7 Claims**



1. An injection nozzle for introducing fuels into compressed gaseous media, for use in premixing burners (**10**) for example, the injection nozzle (**1**) consisting primarily of a fuel conduit (**2**) and a passage (**7**) branching off from the fuel conduit, the fuel conduit (**2**) extending lengthwise essentially at right angles to the direction of introduction of the fuel and the passage (**7**) extending parallel to the direction of introduction of the fuel, wherein the fuel is fed via slots (**6**) in the fuel conduit and by means of the passage (**7**) to an atomization edge (**5**), the inside of the passage (**7**) being made up of distribution panels (**3**) between which distribution pins (**4**) are arranged.

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5,588,825

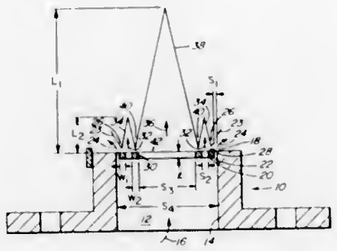
LEAN PREMIXED FUEL BURNER

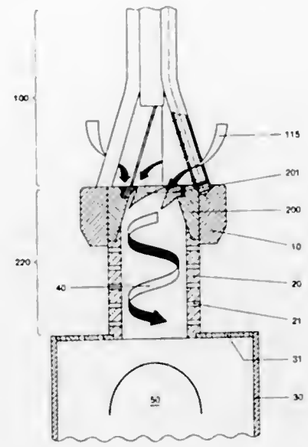
Larry W. Kostiuk, Edmonton, and Matthew R. Johnson, Antigonish, both of Canada, assignors to Governers of the University of Alberta, Edmonton, Canada

Filed Dec. 13, 1995, Ser. No. 572,269

Int. Cl.[6] F23D *14/58*

U.S. Cl. 431—349 **9 Claims**





1. A burner for burning a flow of premix lean gaseous fuel mixtures having an equivalence ratio of less than one comprising a nozzle having an outer periphery defining a passage through which said flow passes, an outer ring stabilizer means positioned within said passage and spaced from said periphery to directly divide said flow of gaseous fuel mixture through said passage into a primary flow portion and a secondary flow portion, said secondary flow portion being adjacent to said periphery and being of significantly less volume than said primary flow portion, flame dividing stabilizer means positioned to divide said primary flow portion into a plurality of discrete subsidiary flow portions, each said subsidiary flow portion forming a subsidiary flame having a base dimension correlated with the desired maximum height of its subsidiary flame, said flame dividing stabilizer means having at least one stabilizer element arranged to define spaces through which said subsidiary flows pass and that correspond with and define said base dimensions of said subsidiary flame immediately downstream thereof, each said ring and said at least one flame stabilizer element having a blunt cross sectional shape to generate recirculating flows of hot product gases that extend across its downstream end, said recirculating flows continually igniting its adjacent subsidiary flows to stabilize its adjacent said flames.

5,588,826

BURNER

Klaus Döbbeling, Windisch; Jürgen Haumann, Rekingen; Hans P. Knöpfel, Besenbüren; Bettina Paikert, Oberrohrdorf; Thomas Ruck, Mellingen; Thomas Sattelamayer, Mandach, and Christian Steinbach, Neuenhof, all of Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Aug. 3, 1995, Ser. No. 510,659

Claims priority, application Germany, Oct. 1, 1994, 44 35 266.2

Int. Cl.[6] F23D *14/62*

U.S. Cl. 431—354 **18 Claims**

1. A burner for a heat generator, the burner having a direction of flow, comprising:

a swirl generator for introducing a swirled combustion air flow into the burner;

means for injecting fuel into the combustion air flow in the swirl generator;

a mixing section connected at a downstream end of the swirl generator to receive the combustion air flow and fuel; and

transition means between the swirl generator and the mixing section including transition passages to guide the swirled combustion air flow and injected fuel from the swirl generator into the mixing section.

5,588,827

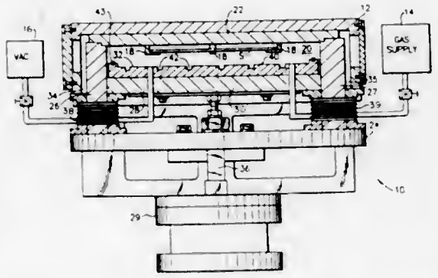
PASSIVE GAS SUBSTRATE THERMAL CONDITIONING APPARATUS AND METHOD

Richard S. Muka, Topsfield, Mass., assignor to Brooks Automation Inc., Chelmsford, Mass.

Continuation-in-part of Ser. No. 169,432, Dec. 17, 1993. This application Jun. 7, 1995, Ser. No. 480,128

Int. Cl.[6] F27B *5/04;* **F27D** *7/02;9/00*

U.S. Cl. 432—5 **12 Claims**



1. An apparatus for changing temperature of a substantially planar substrate, the apparatus comprising:

a chamber;

a plate located in the chamber, the plate having a top surface with grooves therealong, the top surface having means for supporting a substrate thereon with a small gap between the substrate and the top surface;

means for introducing a gas into the chamber; and

means for heating the plate, wherein heat is transferred between the top surface of the plate and the substrate by gas conduction.

5,588,828

VERTICAL BRIGHT ANNEALING FURNACE FOR CONTINUOUS HEAT TREATMENT OF METAL STRIPS

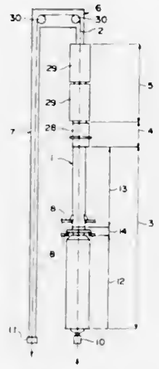
Masato Nagata, Ikoma, Japan, and José Cornejo, Algeciras-Cádiz, Spain, assignors to Chugai Ro Co., Ltd., Osaka, Japan, and Acerinox, S.A., Madrid, Spain

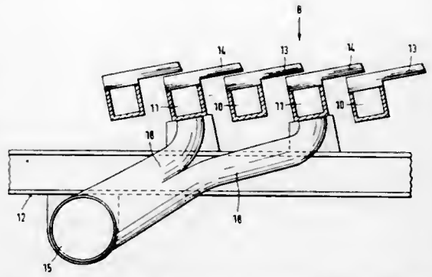
Filed Mar. 31, 1995, Ser. No. 414,232

Claims priority, application Japan, Mar. 31, 1994, 6-062498

Int. Cl.[6] F27B *9/28*

U.S. Cl. 432—59 **5 Claims**





1. A vertical bright-annealing furnace for continuous heat treatment of metal strips, comprising a heating zone for heating a metal strip to a predetermined annealing temperature and a cooling zone for cooling the heated metal strip to a predetermined low temperature, characterized in that said heating zone comprises:

a muffle-type heating station composed of a shell lined with a heat-insulating material, a muffle arranged in said shell, and a first heating means for heating said muffle; and

a refractory-type heating station arranged just above said muffle-type heating station and composed of a shell lined with a heat-insulating material, and a second heating means for heating said metal strip;

said muffle-type and refractory-type heating stations being connected to one another by a flexible connecting unit which is extensible in the longitudinal direction of the heating zone, whereby allowing the metal strip to pass through the refractory-type heating station subsequent to the muffle-type heating station to heat it to a predetermined annealing temperature.

5,588,829

THRUST GRATING COOLER AND METHOD FOR COOLING HOT MATERIAL

Hans-Juergen Stahl, Koeln; Guenter Dittmann, Dessau; Reimer Doege, Zerbst; Richard Schneider, Wermelskirchen, and Ralf Filges, Bergisch Gladbach 1, all of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Koeln, Germany

Continuation of Ser. No. 11,180, Jan. 29, 1993, abandoned. This application May 19, 1994, Ser. No. 273,147

Claims priority, application Germany, Jan. 31, 1992, 42 02 777.2; Dec. 16, 1992, 42 42 374.0

Int. Cl.[6] F27D *15/02;* **F23K** *3/08;* **F23H** *3/02*

U.S. Cl. 432—77 **20 Claims**

1. A thrust grating cooler for cooling hot material comprising:

a plurality of stationary grating plate carriers formed of hollow beams for receiving cooling air;

a plurality of reciprocally movable grating plate carriers formed of hollow beams for receiving cooling air;

a longitudinally reciprocally movable push frame secured to and carrying said movable grating plate carriers;

at least one cooling air channel arranged so as to move together with said push frame;

rigid connecting means for providing communication between said cooling air channel and said movable grating plate carriers; and

a seal for engagement between an air entry end of said movable cooling air channel and a stationary cooling air delivery nozzle.

5,588,830

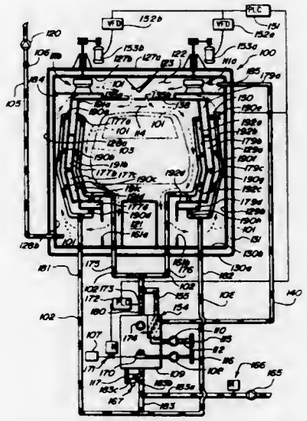
COMBINED RADIANT AND CONVECTION HEATING OVEN

Leif E. B. Josefsson, Lake Orion, and Robert F. Monte, Fair Haven, both of Mich., assignors to ABB Paint Finishing, Inc., Auburn Hills, Mich.

Filed Jan. 13, 1995, Ser. No. 372,595

Int. Cl.[6] F27B *9/00*

U.S. Cl. 432—147 **35 Claims**



1. A combined radiant and convection heating oven for heating an object therein comprising:

a heating chamber extending along a longitudinal axis of the oven;

at least one motor-driven fan having an output in fluid communication with the heating chamber for delivering a convection gas to the chamber and having an input for receiving convection gas returning from the chamber;

at least one radiant heat emitting surface extending substantially parallel to the longitudinal axis and positioned within the heating chamber;

a duct carrying a heated gas and associated with the at least one radiant heat emitting surface for transferring heat thereto;

a source of the heated gas having an output coupled to the duct;

a temperature sensor positioned to monitor temperature of the convection gas returning from the chamber; and

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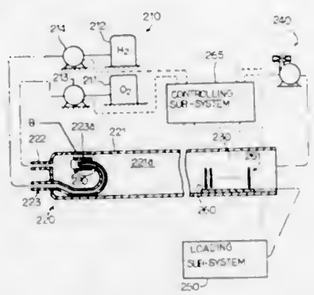
means coupled to the temperature sensor for varying a rate at which heat is transferred from the convection gas and the radiant heat emitting surface to the object while maintaining ambient temperature in the chamber substantially at a predetermined set point.

5,588,831

FURNACE SYSTEM EQUIPPED WITH PROTECTED COMBUSTION NOZZLE USED IN FABRICATION OF SEMICONDUCTOR DEVICE

Satoru Okuyama, Yamagata, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jon. 19, 1995, Ser. No. 492,446
Claims priority, application Japan, Jun. 23, 1994, 6-141421
Int. Cl.[6] F27B *3/00*
U.S. Cl. 432—159 **18 Claims**



1. A furnace system used in a fabrication of a semiconductor device, comprising:

a wafer chamber for treating at least one semiconductor wafer with heat;

a combustion sub-system including a combustion chamber, a first outlet gas nozzle for injecting oxygen gas into said combustion chamber and a second outlet gas nozzle formed of quartz for injecting hydrogen gas into said combustion chamber for generating said heat through a combustion with said oxygen gas; and

a guard member provided for said second outlet gas nozzle so as to space a high temperature region of a flame generated in said combustion from said second outlet gas nozzle, thereby preventing breakage of said second outlet nozzle due to said high temperature region.

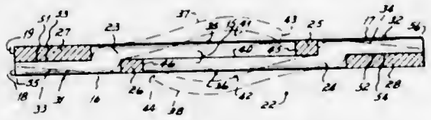
5,588,832

METHOD OF FABRICATING METAL INSTRUMENTS FROM RAW MATERIAL AND ORTHODONTIC PLIERS MADE THEREBY

Farrokh Farzin-Nia, Inglewood, Calif., assignor to Ormco Corporation, Glendora, Calif.

Filed Aug. 23, 1994, Ser. No. 294,653
Int. Cl.[6] A61C *3/00;* **B21D** *28/00;* **B25B** *7/02;* **B21K** *5/00*
U.S. Cl. 433—4 **21 Claims**

1. A method of fabricating an instrument having a handle and a



head each formed of a portion of two pivotally interconnected parts each having a convexly curved surface thereon, the method comprising the steps of:

providing a bar of raw metallic material having an elongated cross-section, generally flat parallel top and bottom surfaces and two opposite convex side surfaces;

separating the bar into two pieces by a cut through the bar to at least partially form a part from each of the pieces, each part having two ends and an outer surface of a convex shape defined by a convex side surface of the bar;

manufacturing from the parts an instrument having at least two outer surfaces having the convex shape;

forming a handle portion at one end of each of the parts that includes the outer surface thereof of the convex shape, and forming a head portion at the other end of each of the parts; and

pivotally interconnecting the parts between the handle portion and head portion to form an instrument having a handle and a head such that the force can be applied against the convex shape of the outer surfaces of the parts to pivot the head portions toward each other.

5,588,833

SYSTEM OF TREATMENT FOR USE IN FUNCTIONAL ORTHODONTICS

Georg Risse, Bogenstrasse 15-16, D-4400 Mönster, Germany

Continuation of Ser. No. 965,408, Feb. 23, 1993, abandoned.
This application Nov. 16, 1994, Ser. No. 340,645
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—24 **16 Claims**

1. Apparatus comprising at least one orthodontic wire for use as an archwire and at least one bracket, said at least one wire having a rectangular cross-section and having two short edges and two long edges, said short edges being not longer than 0.015 inches (0.381 mm) and said long edges being not longer than 0.020 inches (0.508 mm), said at least one bracket having a single rectangular cross-section slot, said slot having two short sides and two long sides, the short sides being 0.018 inches (0.457 mm) and the long sides being 0.022 inches (0.559 mm), the dimensions of said at least one wire and said slot being selected so that, when said at least one wire is inserted into said slot, there is play of the wire in the slot.

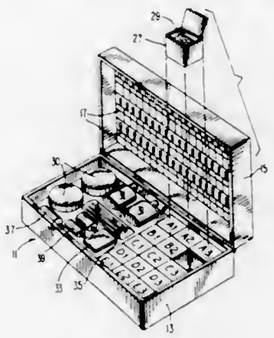
5,588,834

SYSTEM FOR COLOR MATCHING A DENTAL PROSTHESIS

Richard E. Resk, 85-14 158th Ave., Howard Beach, N.Y. 11414; Jeffrey R. Shapiro, 35 Liberty St. #19C, New York, N.Y. 10005, and Daniel Materdomini, P.O. Box 781, Woodland Hills, Calif. 91365

Filed May 18, 1995, Ser. No. 444,150
Int. Cl.[6] A61C *19/10;5/08*
U.S. Cl. 433—26 **15 Claims**

1. A system for customized color matching of a dental prosthesis



comprising:

a color range finder comprising a plurality of color elements, each of said elements identifying a different color than the remaining elements;

a plurality of shells comprising individual shell groups, the shells of each of said group specially designed and anatomically configured for selective direct placement intimately over a specific anterior or posterior tooth that has been prepared for receiving said dental prosthesis, at least one of said specially designed and anatomically configured shells in each shell group corresponding in color to the basic color of each of said range finder elements; and

means for selectively coloring a selected shell.

5,588,835

ENDODONTIC OBTURATOR

Jimmie Kert, Norrevanget 76, DK-3500 Vaerlose, Denmark

Continuation of Ser. No. 325,664, Oct. 19, 1994, abandoned.
This application Nov. 1, 1995, Ser. No. 551,698
Int. Cl.[6] A61G *5/02;* **A61C** *5/02*
U.S. Cl. 433—81 **6 Claims**

1. Appliance for use in filling an endodontically prepared root canal and of the kind comprising:

a) a central insertion rod (**2**) surrounded partly by

b) an elongate filler body (**3**, **4**) of plastic material consisting of a core (**4**) and an outer filler body (**3**), said core (**4**) surrounding said rod (**2**) and said outer filler body (**3**) surrounding said core (**4**), said core (**4**) and said outer filler body (**3**) consisting of materials of differing softening points, and

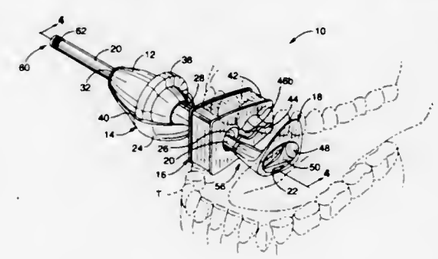
c) the softening point of the material of said core (**4**) being lower than that of the material of said outer filler body (**3**).

5,588,836

MOUTH PROP AND TONGUE DEFLECTOR APPARATUS

Timothy J. Landis, Loomis, and Scott M. Perry, Auburn, both of Calif., assignors to OP-D-OP, Inc., Roseville, Calif.

Filed Oct. 23, 1995, Ser. No. 543,843
Int. Cl.[6] A61C *17/06;17/14*
U.S. Cl. 433—93 **20 Claims**



1. A mouth prop and tongue retractor apparatus, comprising:

(a) a handle;

(b) a base, said handle rotatably coupled to said base;

(c) a mouth prop, said mouth prop coupled to said base;

(d) tongue retractor means for positioning a patient's tongue;

(e) suction means for removing saliva front a patient's mouth, said suction means coupled to said tongue retractor means;

(f) gimbal adjustment means for adjustably positioning said tongue retractor means and said suction means relative to said mouth prop; and

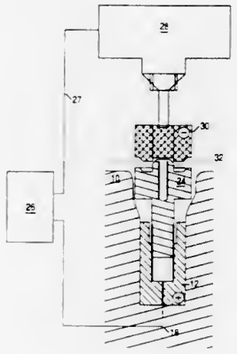
(g) extension adjustment means for positioning said tongue retractor means and said suction means relative to said handle and said base.

5,588,837

METHOD AND EQUIPMENT FOR THE FORMATION OF PROSTHETIC TOOTH STRUCTURES FOR FASTENING TO IMPLANTS

Gunter Rubeling, Bremerhaven, and Burghard Otten, Misselwarden, both of Germany, assignors to Günter Rübeling, Germany

Filed Jan. 11, 1995, Ser. No. 373,639
Claims priority, application Germany, Jan. 28, 1994, 44 02 511.4
Int. Cl.[6] A61C *13/12;13/225;8/00*
U.S. Cl. 433—172 **8 Claims**



1. A method of forming prosthetic tooth structures for fastening to implants in a patient's jawbone, comprising the steps of:

producing a pattern from a portion of the patient's jawbone containing the implants and arranging metal pattern sockets in the pattern so that positions of the pattern sockets in the pattern correspond to positions of the implants in the patient's jawbone;

releasably fastening dummy implants into each of the pattern sockets, heads of the dummy implants corresponding to heads of respective implants in the patient's jawbone;

producing a metal prosthetic tooth structure using the pattern and the dummy implants;

replacing the dummy implants with metal implant electrodes releasably fastened in the pattern sockets, heads of the implant electrodes corresponding with the heads of respective implants in the patient's jawbone when taking into consideration a sparkgap for spark erosion;

connecting the prosthetic tooth structure and either the pattern sockets or the implant electrodes to spark erosion equipment so that the prosthetic tooth structure forms a first electrode and, respectively, either the pattern sockets or the implant electrodes form a second electrode, and

moving the pattern and the prosthetic tooth structure against each other so as to erode the prosthetic tooth structure so that the prosthetic tooth structure is adapted to the heads of the implants in the patient's jawbone.

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5,588,838

FIXTURE FOR USE IN A DENTAL IMPLANT SYSTEM

Stig G. V. Hansson, Askim, and Anders Holmén, Sweden, both of Sweden, assignors to Astra Aktiebolag, Södertälje, Sweden

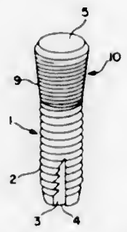
PCT No. PCT/SE93/00871, § 371 Date Apr. 26, 1995, § 102(e) Date Apr. 26, 1995, PCT Pub. No. WO94/09717, PCT Pub. Date May 11, 1994

PCT Filed Oct. 25, 1993, Ser. No. 424,404

Claims priority, application Sweden, Oct. 28, 1992, 9203184

Int. Cl.[6] A61C *8/00*

U.S. Cl. 433—173 **9 Claims**



1. In a fixture for use in a dental implant system, said fixture having an outer end provided with a conically flaring outer surface intended to at least partly abut the bone tissue, the improvement wherein said conically flaring outer surface is provided with a circumferentially oriented, defined micro-roughness (**9**, **109**) having a height between 0.02 and 0.20 mm.

5,588,839

INFORMATION PROCESSING APPARATUS

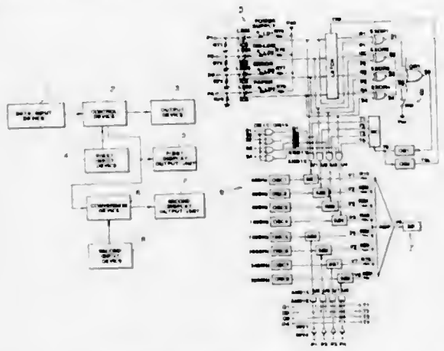
Isamu Shimoda, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 77,050, Jun. 16, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 601,819

Claims priority, application Japan, Jun. 16, 1992, 4-157053

Int. Cl.[6] G09B *21/00*

U.S. Cl. 434—114 **23 Claims**



1. An information processing apparatus for physically-handicapped users, said apparatus comprising:

control means for generating information on the operating state of said information processing apparatus,

input means for inputting information to said control means;

a first display output unit for displaying a plurality of information on the operating state of said information processing apparatus as visual display information;

said control means generating a plurality of kinds of output signals corresponding to each of the plurality of information to be displayed visually on said first display output unit;

conversion means for converting output signals generated by said control means to one of auditory display information adapted to be auditorily perceived by a visually impaired user and tactile display information adapted to be perceived using tactile perception by a hearing impaired user; and

a second display output unit, for outputting the information converted by said conversion means as a sound, or vibration, comprising an electromechanically vibrated member.

23. An electronic apparatus for processing information, said apparatus comprising:

generating means for generating mode information relating to the functioning of said apparatus and output signals corresponding to the kinds of mode information;

input means for inputting information to said generating means;

display means for displaying the mode information generated by said generating means;

conversion means for converting the output signals generated by said generating means to a sound or vibration corresponding to the kinds of the mode information;

output means, comprising an electromechanically vibrated member, for outputting the output signals corresponding to the kind of mode information displayed by said display means with the sound or the vibration converted by conversion means; and

instruction means for instructing said output means to output the output signals corresponding to the kind of mode information displayed by said display means.

5,588,840

Patent Not Issued For This Number

5,588,841

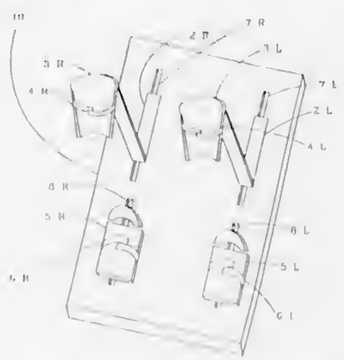
APPARATUS AND METHOD FOR THE TEACHING OF STANDING BALANCE

Richard W. Mechliog, 526 St. Charles Ave. NE., Atlanta, Ga. 30308

Filed Apr. 5, 1995, Ser. No. 416,639

Int. Cl.[6] G09B *19/00*

U.S. Cl. 434—255 **5 Claims**



1. A method of teaching the skill of standing balance, comprising the steps of:

(a) providing lower-leg support to allow maintenance of a relatively vertical tibial and calf position;

(b) providing foot support to allow maintenance of foot position relative to said lower-leg support;

(c) situating a subject in a standing position with lower legs and feet supported by said lower-leg support and said foot support, respectively;

(d) selecting a degree of calf and tibial movement relative to vertical to be allowed by said lower-leg support and;

(e) allowing the subject to attempt to perform standing balance with said foot position and with said allowed degree of tibial and calf movement relative to vertical.

5,588,842

KARAOKE CONTROL SYSTEM FOR A PLURALITY OF KARAOKE DEVICES

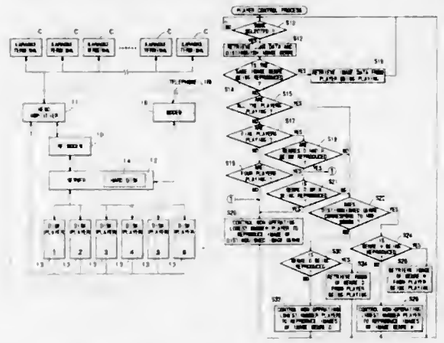
Osamu Nishimura, and Hiroshi Nishikawa, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, and Xing Inc., Aichi-ken, both of Japan

Filed Apr. 5, 1995, Ser. No. 417,389

Claims priority, application Japan, Apr. 6, 1994, 6-093696

Int. Cl.[6] G09B *5/00;* **G10H** *1/36*

U.S. Cl. 434—307 A **13 Claims**



1. A karaoke control system for controlling a plurality of karaoke devices to play accompaniment music of desired songs while displaying lyrics of the desired songs and background images suitable for the desired songs, the karaoke control system comprising:

a central control device including song data storing means for storing song data for a plurality of songs, the song data for each song including music data representative of an accompaniment music of the corresponding song and lyric data representative of lyrics of the corresponding song, the song data being added with image genre data representative of an image genre most suitable for the corresponding song; and

a plurality of karaoke devices connected to the central control device via a transmission line, each of the plurality of karaoke devices including song selecting means for selecting a song desired to be sung out of the plurality of songs,

wherein the central control device further includes:

song data retrieving means for retrieving song data for the songs selected at the karaoke devices;

a plurality of image data memory means for storing a plurality of image data groups of a plurality of image genres, each image data group being made from two or more image data edited to represent images of a corresponding image genre, and at least one image data group of at least one common image genre, each common image genre being common to several ones of the plurality of image genres, the image data group of each common image genre being made from two or more image data edited to represent images of a corresponding common image genre;

a plurality of image data retrieval means for retrieving image data from the plurality of image data memory means;

image genre determination means for determining image genres most appropriate for the selected songs, based on the image genre data added to the song data retrieved for the selected songs;

control means for controlling the image data retrieval means to retrieve image data from the plurality of image data memory means, the control means controlling each of the image data retrieval means to retrieve image data from one of an image data group of the determined image genre and an image data group of a common image genre that is common to the determined image genre; and

transmission means for transmitting the retrieved song data and the retrieved image data to the karaoke devices, and

wherein each of the plurality of karaoke devices includes:

music play means for receiving the music data included in the transmitted song data and for playing accompaniment music based on the song data; and

image reproduction means for receiving the lyric data included in the transmitted song data and the transmitted image data, for combining the lyrics represented by the lyric data and the images represented by the image data as background images, and for displaying the combined images.

11. A karaoke control system for controlling a plurality of karaoke devices to play accompaniment music of desired songs while displaying lyrics of the desired songs and background images suitable for the desired songs, the karaoke control system comprising:

a central control device and a plurality of karaoke devices connected to the central control device via a transmission line,

wherein the central control device includes:

a song data storing unit for storing song data for a plurality of songs, the song data for each song including music data representative of an accompaniment music of the corresponding song and lyric data representative of lyrics of the corresponding song, the song data being added with image genre data representative of an image genre most suitable for the corresponding song;

a plurality of image data memories for storing a plurality of image data groups of a plurality of image genres, each group being formed from two or more sets of image data edited to represent images of a corresponding image genre, and at least one common image data group, each group being formed from two or more sets of image data edited to represent images of a corresponding common image genre that is common to several ones of the plurality of image genres; and

a plurality of image data retrieval units for retrieving image data from the plurality of image data memories;

wherein each of the plurality of karaoke devices includes a song selecting unit for selecting a song desired to be sung out of the plurality of songs,

wherein the central control device further includes:

a song data retrieving unit for retrieving song data for the songs selected at the karaoke devices from the song data storing unit;

an image genre distinguishing unit for distinguishing image genres most appropriate for the selected songs, based on the image genre data added to the song data retrieved for the selected songs;

a control unit for controlling the image data retrieval units to retrieve image data from the plurality of image data memories, the control unit controlling each of the image data retrieval unit to retrieve image data of an image data group of the distinguished image genre, the control unit compulsorily controlling at least one of the plurality of image retrieval units to retrieve image data of an image data group of a common image genre common to the distinguished image genre, regardless of what image genre is distinguished by the image genre distinguishing unit, when the number of image genres distinguished by the image genre distinguishing unit increases to a value close to the number of image data retrieval units; and

a transmission unit for transmitting the retrieved song data and the retrieved image data to the karaoke devices.

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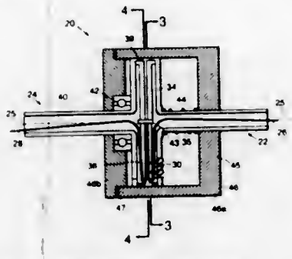
5,588,843

ROTARY ELECTRICAL CONNECTOR

Mohi Sobhani, Encino, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 8, 1994, Ser. No. 351,914
Int. Cl.[6] H01R *39/00*
U.S. Cl. 439—22 **14 Claims**



1. A rotary electrical connector, comprising:

a first-side connector member comprising a printed wiring board and having a first-side connector face lying perpendicular to a rotational axis, the first-side connector face having a plurality of first-side engagement members arranged as concentric rings thereon;

a plurality of first-side electrical conductors, each of the first-side electrical conductors including a first-side electrical contact with at least one of the plurality of first-side engagement members;

a second-side connector member having a second-side connector face lying perpendicular to the rotational axis, the second-side connector face having a plurality of second-side engagement members thereon disposed such that each of the second-side engagement members contacts one of the first-side engagement members when the first-side engagement face and the second-side engagement face are placed into facing contact;

a plurality of second-side electrical conductors, each of the second-side electrical conductors including a second-side electrical contact with at least one of the plurality of second-side engagement members;

support means for positioning the first-side connector member in facing contact with the second-side connector member and for permitting the second-side connector member to rotate with respect to the first-side connector member about the rotational axis; and

biasing means for biasing the first-side connector face against the second-side connector face.

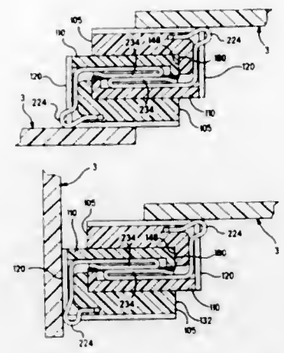
5,588,844

VARIABLE ORIENTATION, SURFACE MOUNTED CONNECTOR

Lynn R. Sipe, Lewistown, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 342,934, Nov. 21, 1994, Pat. No. 5,520,545. This application Mar. 14, 1996, Ser. No. 615,382
Int. Cl.[6] H01R *13/73;23/72*
U.S. Cl. 439—65 **13 Claims**

1. An electrical connector comprising an insulative housing and a plurality of electrical contacts, each of said contacts being mounted in said housing so as to be surface mountable to a printed circuit board regardless of whether said electrical connector is mounted vertically or horizontally thereto, and two board mounts laterally disposed in two corresponding cavities, wherein each of said board mounts is adapted to rotate relative to said housing between (i) a first position wherein said electrical connector is oriented vertically with respect to said printed circuit board when



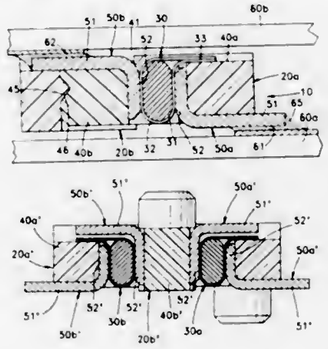
surface mounted thereto, and (ii) a second position wherein said electrical connector is oriented horizontally with respect to said printed circuit board when surface mounted thereto.

5,588,845

CONNECTORS FOR BASE BOARDS AND METHODS OF CONNECTOR OF BASE BOARDS

Takaki Naitoh, Inagi, and Okitsugu Furuya, Tokyo, both of Japan, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 8, 1994, Ser. No. 351,982
Claims priority, application Japan, Feb. 9, 1994, 6-036551
Int. Cl.[6] H01R *4/58;9/09*
U.S. Cl. 439—66 **18 Claims**



1. A connector for interconnecting first and second base boards each having a plurality of electrical lands, comprising:

a plurality of first contacts each having a connecting section arranged for engaging a respective one of the electrical lands on the first base board, and a contacting section;

a plurality of second contacts each having a connecting section arranged for engaging a respective one of the electrical lands on the second base board, and a contacting section; and

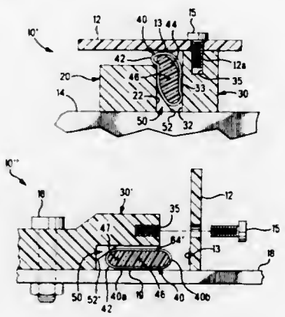
an elastic connecting component interconnecting the contacting sections of the first contacts with respective ones of the contacting sections of the second contacts.

5,588,846

RIGHT ANGLE ELECTRICAL CONNECTOR

Robert D. Irlbeck, Greensboro; Warren A. Bates, Winston-Salem, both of N.C.; Robert Dumas, North Palm Beach, Fla., and Keith L. Volz, Jamestown, N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 25, 1995, Ser. No. 519,208
Int. Cl.[6] H01R *9/9*
U.S. Cl. 439—66 **14 Claims**



1. An electrical connector for electrically interconnecting circuit traces on a printed circuit board and circuit traces on an electrical device, said electrical connector comprising:

a resilient electrical component with a flexible film circuit wrapped around a center thereof for electrical interconnection with said circuit traces;

a connector block member disposed adjacent to said electrical device;

first and second walls formed on said electrical device and said block member, respectively, said walls defining a chamber for receipt of said resilient electrical component; and

a biasing member located within said chamber for biasingly engaging said resilient electrical component when said resilient electrical component is pressed into said chamber,

whereby said resilient electrical component is translated and deformed within said chamber by the pressing action of said printed circuit board.

5,588,847

CHIP CARRIER MOUNTING SYSTEM

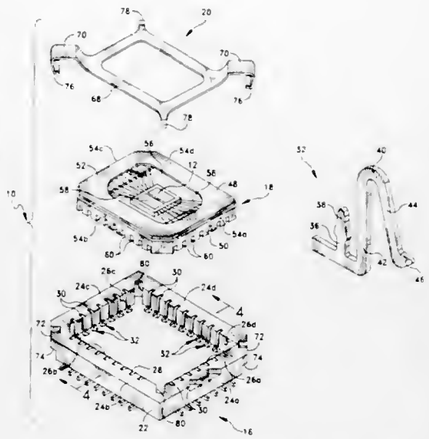
John O. Tate, P.O. Box 353, Uxbridge, Mass. 01569

Filed Apr. 13, 1995, Ser. No. 421,839
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—71 **4 Claims**

1. A chip carrier mounting system capable of mounting a computer chip on a printed circuit board, said mounting system comprising:

a chip carrier socket adapted for mounting on a printed circuit board, said chip carrier socket having a rectangular frame with inwardly facing surfaces which define a rectangular opening, and a plurality of spaced-apart, inwardly projecting contact members each being mounted on the frame and resiliently movable along a plane generally perpendicular to the plane of its respective surface, each contact member being constructed of electrically conductive material and having a leg with a base and an inwardly extending, tapered foot portion; and

a chip carrier constructed and arranged for receiving and securing a chip thereto, said chip carrier having outwardly facing surfaces adapted to face the inwardly facing surfaces of the chip carrier socket when placing the chip carrier within the opening of the socket, and a plurality of spaced-apart receiving slots in registry with and capable of receiving said contact members therein for securing the chip carrier to the chip carrier socket, each receiving slot having an electrically con-



ductive surface mount for providing electrical connection between the chip, chip carrier, chip carrier socket and printed circuit board when said foot portion of each contact member is in resilient engagement with the electrically conductive surface mount of its respective receiving slot,

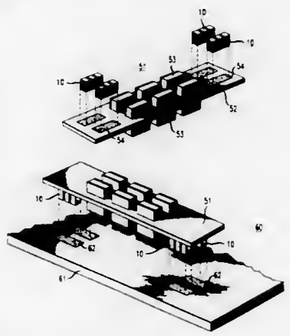
wherein said foot portion of each contact member is formed to taper from the base of the leg in a widthwise dimension to a narrowed, rounded end for enhancing the electrical connection between said contact member and surface mount and for maintaining said chip carrier and said chip carrier socket in assembled relation.

5,588,848

LOW INDUCTANCE SURFACE-MOUNT CONNECTORS FOR INTERCONNECTING CIRCUIT DEVICES AND METHOD FOR USING SAME

Ronald L. Law, Allen; Apurba Roy, Rockwall, and Steven A. Shewmake, Mesquite, all of Tex., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 8, 1994, Ser. No. 302,559
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—83 **19 Claims**



1. A surface-mount connector for electrically interconnecting two circuit devices comprising:

a metallic rectangular parallelepiped which is hollow along one axis, said parallelepiped having at least one slot in a plane transverse to said axis and extending over three of the four sidewalls of said hollow parallelepiped, the remaining sidewall being unslotted.

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5,588,849

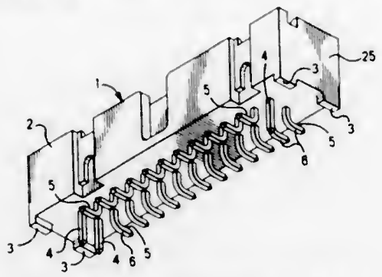
CONNECTOR WITH PIN TERMINALS ADAPTED FOR SURFACE MOUNTING

Richard A. Kile, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 325,007, Oct. 18, 1994, abandoned. This application Aug. 2, 1996, Ser. No. 691,441

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—83 **5 Claims**



1. An electrical connection arrangement comprising:

a circuit board having a connector site having a plurality of contact pads in an array of at least two rows thereof on a board surface, and at least two through-holes substantially at ends of the array of contact pads, the contact pads and at least two through-holes defining electrical connection sites; and

an electrical connector comprising an insulative housing including a base having a bottom surface mounted on a surface of a circuit board, and including at least twelve conductive terminals disposed in said housing and including respective pin terminal portions, said pin terminal portions extending initially orthogonally beyond said bottom surface of said base in an array of at least two rows, at least two of the pin terminal portions at ends of said at least two rows being unbent to provide locating pin terminal portions adapted to be soldered in the at least two through-holes of the circuit boards, and remaining pin terminal portions being bent to extend parallel to the base and across respective contact pads along the surface of the circuit board, with ones of said bent terminal portions extending in a first direction and others thereof extending in an opposed second direction to provide at least two rows of surface mount electrical connections with said at least two rows of contact pads,

remaining portions of said conductive terminals being identical within said housing, and said at least two through-holes being located asymmetrically within the array of contact pads, and said at least two unbent terminal portions being correspondingly located asymmetrically within the array of terminal portions,

whereby the circuit board need not provide a through-hole at every electrical connection site thereof, and said connector is keyed by selecting said at least two terminal portions located asymmetrically within the array of terminal portions to remain unbent while the remaining terminal portions are bent, to establish polarization with respect to the circuit board to allow mounting in only a single orientation.

5,588,850

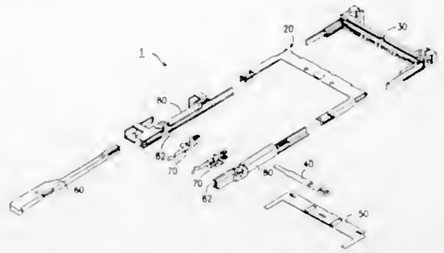
GROUNDING MEANS FOR MEMORY CARD CONNECTOR

H. T. Pan, and Chu-Mei Chen, both of Taipei Hsien, Taiwan, assignors to Tongrand Limited, Queensway, Hong Kong

Filed Aug. 8, 1995, Ser. No. 512,335

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—92 **9 Claims**



1. A grounding arrangement for a memory card connector, said memory card connector comprising a guide frame having a pair of guiding slots, each of said guiding slots having formed therein a first pair of horizontally extending notches and a vertically extending receiving slot, said grounding arrangement being fastened to and generally received within only a corresponding one of said guiding slots and comprising:

an elongated body;

a curved contact portion proximate one end of said elongated body that has a portion above a surface of said elongated body;

an end portion integrally extending from said contact portion and positioned at a remote end beyond said contact portion of said elongated body;

a first pair of horizontally extending bent portions respectively located at opposing sides of said elongated body and extending perpendicular to and away from the surface of said elongated body, each of said first bent portions having thereon a latching arrangement;

wherein when said grounding arrangement is assembled to a designated location on said guide frame of said memory card connector, said end portion is received in said receiving slot of said guiding slot, each of said first pair of bent portions is inserted into a corresponding one of said first pair of notches, and said latching arrangement of said first pair of bent portions latch with corresponding configurations inside said corresponding notches.

5,588,851

CONNECTOR FOR A CABLE FOR HIGH FREQUENCY SIGNALS

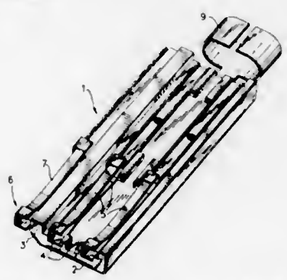
Danny Morlion, St. Amandsberg; Luc Jonckheere, Leuven, and Jan P. K. van Koetsem, Zwijndrecht, all of Belgium, assignors to Framatome Connectors International, Paris, France

Division of Ser. No. 399,171, Mar. 2, 1995, Pat. No. 5,525,066. This application Jan. 31, 1996, Ser. No. 594,765

Claims priority, application Netherlands, Mar. 3, 1994, 9400321

Int. Cl.[6] H01R *4/66*

U.S. Cl. 439—108 **10 Claims**



1. Connector for a cable for high frequency signals, in particular for connecting the cable with contact pins on a printed circuit board, comprising female signal contact members, a ground plate and a housing of dielectric material with cavities having the female contact members therein, wherein a central part of the ground plate is bent into a U-shaped part with opposite legs to form a female ground contact member unitary with the ground plate, contact springs being formed in the opposite legs of the U-shaped part, said contact springs being adapted to engage a ground contact pin insertable into the U-shaped part, wherein the female signal contact members are provided at each side of the female ground contact member.

5,588,852

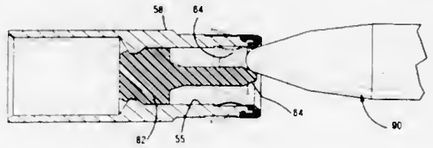
ELECTRICAL CONNECTOR HAVING SOCKET CONTACTS WITH SAFETY SHIELDS

Dean A. Puerner, Maricopa, Ariz., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 21, 1995, Ser. No. 408,050

Int. Cl.[6] H01R *13/44;13/187*

U.S. Cl. 439—135 **8 Claims**



1. A plug connector which is matable with a receptacle connector to form an electrical connector assembly, the plug connector comprising:

a dielectric housing having at least one cavity which extends inwardly from a mating face of the housing;

an electrically conductive socket contact disposed in the at least one cavity, the socket contact being generally tubular with inner and outer surfaces and having a contact section adapted for mating with a corresponding pin contact of the receptacle connector, the contact section having an end face disposed in a vicinity of the mating face;

a first dielectric member disposed on the socket contact and extending at least over the end face; and

a second dielectric member disposed within the socket contact the second dielectric member having a post disposed in the contact section so as to define a gap between the post and the inner surface of the contact section;

wherein inadvertent electrical engagement with the socket contact is prevented.

5,588,853

CLOSURE CAP WITH GASKET FOR ELECTRICAL CONNECTOR HOUSING

John C. Anthony, Fairfield, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed May 17, 1995, Ser. No. 442,897

Int. Cl.[6] H01R *13/44*

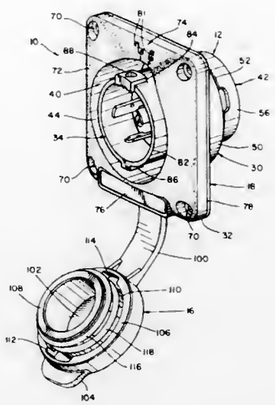
U.S. Cl. 439—136 **25 Claims**

1. A sealing arrangement for sealing a mounted electrical connector housing, comprising:

a closure cap including an annular sealing member constructed of a sealing material for releasably engaging the electrical connector housing;

a gasket having a body portion with an opening which is sized for accommodating a portion of the mounted electrical connector through said opening of said body portion; and

a strap directly attached to said closure cap and to said gasket.



5,588,854

ELECTRICAL CONNECTION DEVICE BETWEEN HANDLE AND STEERING COLUMN

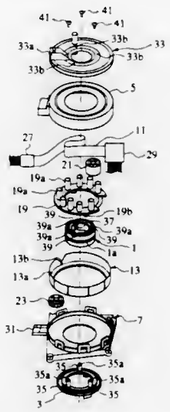
Tohru Ikumi; Nobuhiko Suzuki, and Satoshi Ishikawa, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 22, 1995, Ser. No. 517,623

Claims priority, application Japan, Aug. 26, 1994, 6-202250

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—164 **6 Claims**



1. An electrical connection device between a handle having an axle and a steering column for a vehicle, said device comprising:

a rotor into which the handle axle is fixed, said rotor having an annular projection with an axially facing radially convex surface;

a housing fixed to the steering column to rotatably support said rotor, said housing and said rotor defining an annular space, said housing having an annular recess with a radially concave surface for engaging the axially facing convex surface of said rotor; and

a flexible flat cable accommodated in the annular space and of a length to accommodate clockwise and counterclockwise rotations of said rotor, said flexible flat cable having one end connected to said housing and another end connected to said rotor thereby to electrically connect said housing with said rotor.

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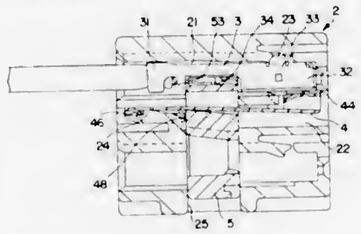
2. An electrical connection device as claimed in claim 1, wherein said rotor comprises a first rotor element to which said another end of said flat cable is connected, and a second rotor element having an axial end engaged with a side of the first rotor element from outside of said housing and having another axial end exposed outside of said housing.

5,588,855
CONNECTOR
Yuichi Nankoh, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Apr. 10, 1995, Ser. No. 419,422
Claims priority, application Japan, Apr. 20, 1994, 6-106086
Int. Cl.[6] H01R *31/08*
U.S. Cl. 439—188 **11 Claims**



1. A connector comprising:

a housing having a plurality of supply terminal cavities and at least one short-circuit terminal cavity, said housing further including a mount hole communicating with said supply terminal cavities and with said short-circuit terminal cavity;

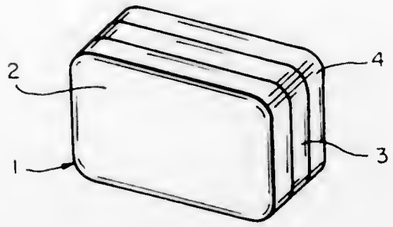
a plurality of supply circuit terminals in the respective supply terminal cavities of the housing;

a short-circuit terminal in the short-circuit terminal cavity of the housing, said short-circuit terminal including a plurality of contact portions aligned respectively with the supply circuit terminals; and

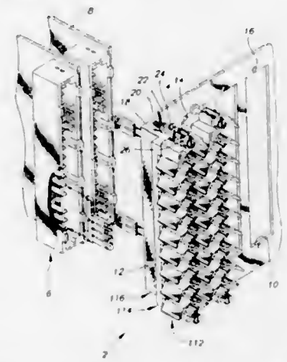
a retainer movable from a temporary locking position in said mount hole to a main locking position therein, said retainer having a locking means for locking engagement with said supply circuit terminals and with said short-circuit terminal when said retainer is in said main locking position, said retainer further having biasing means for pressing the contact portions of the short-circuit terminal into shorting electrical contact with the respective supply circuit terminals.

5,588,856
SEALING MEMBER AND METHODS OF SEALING
Mary A. Collins, Fremont; David G. Perkins, Union City, and Harry E. White, Newark, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 584,320, Sep. 18, 1991, abandoned. This application Jan. 14, 1992, Ser. No. 762,533
Int. Cl.[6] H01R *4/60*
U.S. Cl. 439—204 **9 Claims**

7. A preformed sealing member for sealing an open end of a hollow member which comprises a self-supporting article having at least one layer of sealant positioned longitudinally between two constraining layers, wherein each of said layers has substantially the same lateral dimensions and at least one of said constraining layers comprises a compressible foam.



5,588,857
CENTERING SPRING SUPPORT FOR PANEL MOUNT CONNECTORS
Günter Feldmeier, Lorsch, and Christian Schrettlinger, Bensheim, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.
Filed Dec. 22, 1994, Ser. No. 362,319
Claims priority, application United Kingdom, Jan. 4, 1994, 9400024
Int. Cl.[6] H01R *13/64*
U.S. Cl. 439—248 **8 Claims**

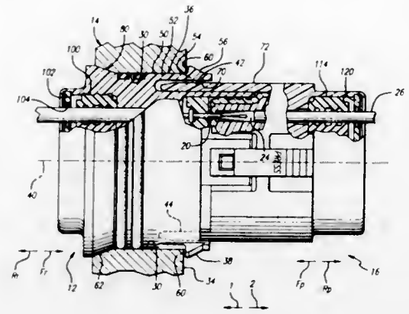


1. An electrical connector securable to a panel, and being movable with respect to the panel, the connector being characterized in that the connector comprises a securing member comprised of a resilient centering spring member and a separate fastener member, said spring member cooperable with the fastener member for flotably securing said connector to the panel, and biasing said connector toward a central axial position with respect to the panel.

5,588,858
CONNECTOR SYSTEM WITH WEDGE AND GROMMET RETAINER
Lester J. Lester, Signal Mill, and Gary N. Van Trump, Santa Ana, both of Calif., assignors to ITT Corporation, Santa Ana, Calif.
Filed Mar. 15, 1995, Ser. No. 404,894
Int. Cl.[6] H01R *13/52*
U.S. Cl. 439—275 **9 Claims**

1. A connector having an axis, having a housing front insulator portion with a plurality of contact-receiving holes, and having an elastomeric grommet lying within said housing at a location rearward of said front insulator with said grommet having a plurality of axially-extending through holes for passing wires, characterized by:

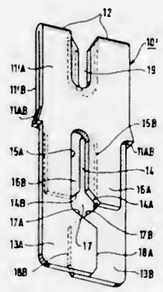
a retainer mounted on said housing rearward of said grommet and having a plurality of retainer holes that can pass wires



that extend through said grommet holes, said retainer having a plurality of forwardly projecting posts arranged in a first pattern;

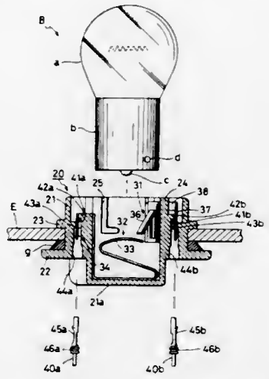
said grommet has a rear end with a plurality of post-receiving holes arranged in said first pattern to receive said posts.

5,588,859
HERMAPHRODITE CONTACT AND A CONNECTION DEFINED BY A PAIR OF SUCH CONTACTS
Denis Maurice, Rimogne, France, assignor to Alcatel Cable Interface, Vrigne Aux Bois, France
Filed Sep. 15, 1994, Ser. No. 306,595
Claims priority, application France, Sep. 20, 1993, 93 11162
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—290 **7 Claims**



1. A hermaphrodite contact, flat and substantially rectangular in shape, comprising a first end portion and a corresponding first end edge, a second end portion and a corresponding second end edge of said contact opposite said first end portion and said first end edge, an intermediate portion between said first and second end portions, at least one resilient arm which extends along said intermediate and second end portions and defines a hermaphrodite coupling terminal arm along said second end portion of the contact for hermaphrodite coupling of said contact to another substantially identical contact provided with at least one corresponding resilient arm, at least one truncated branch which extends from the first end portion towards the second end portion and along each resilient arm and is shorter than this resilient arm, and a main insulating displacement fork which extends substantially along the intermediate portion of the contact and between each resilient arm and the truncated branch and has an opening access facing the second end portion of said contact.

5,588,860
BULB SOCKET
Takahiro Uchiyama, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan
Filed Jul. 20, 1994, Ser. No. 277,770
Claims priority, application Japan, Aug. 6, 1993, 5-215035
Int. Cl.[6] H01R *4/48*
U.S. Cl. 439—336 **6 Claims**



1. A bulb socket for receiving a bulb having a plus electrode and a minus electrode, said bulb socket comprising:

a socket housing having a bottom wall, an outer side wall, an inner side wall and retaining portion, said bottom wall and inner side wall defining a bulb receiving portion, said outer side wall surrounding the inner side wall, and said retaining portions being disposed between the inner and outer side walls, a bottom surface of the retaining portions having spaced openings of connection holes extending at least partially therethrough in an axial direction of the socket housing;

a plus terminal mounted in said socket housing, said plus terminal including a bulb-side plus terminal portion for electrically connecting with the plus electrode of the bulb and a feeder-side plus terminal portion for electrically connecting with an external plus terminal, said bulb-side plus terminal portion and said feeder-side plus terminal portion being disposed in a juxtaposed condition within said socket housing; and

a minus terminal mounted in said socket housing, said minus terminal including a bulb-side minus terminal portion for electrically connecting with the minus electrode of the bulb and a feeder-side minus terminal portion for electrically connecting with an external minus terminal, said bulb-side minus terminal portion and said feeder-side minus terminal portion being disposed in a juxtaposed condition within said socket housing, wherein said feeder-side plus terminal portion and said feeder-side minus terminal portion each have a portion that extend in the axial direction within the connection holes of the retaining portions.

5,588,861
ZIF CHIP SOCKET
Peter K. Townsend, Camp Hill, Pa., assignor to Berg Technology, Inc., Reno, Nev.
Continuation-in-part of Ser. No. 275,959, Jul. 15, 1994. This application Dec. 30, 1994, Ser. No. 367,085
Int. Cl.[6] H01R *4/50*
U.S. Cl. 439—342 **1 Claim**

1. A pin grid array socket for connecting an integrated circuit (IC) having a plurality of pins to a circuit substrate, said socket comprising:

a base having a plurality of contacts and said base being mountable on said circuit substrate so that said contacts can be directly electrically connected to said circuit substrate said

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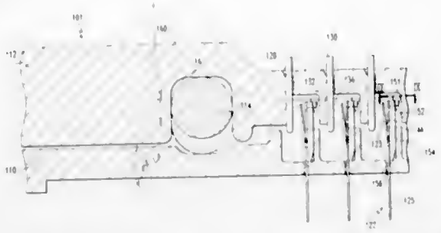


base having at least two side walls therein, each of said side walls having a plurality of support receiving slots;

a cover having a plurality of insertion holes for receiving said plurality of pins and said cover being attached to said base and slidably from a first position to a second position so that said plurality of pins can be moved from said first position to said second position to form an electrical interface with said plurality of contacts;

a plurality of buttresses connected to said cover each of said buttresses directly supporting a corresponding pin when the cover is in the first and second positions and

said contacts each comprising a moveable contact beam element for engaging the corresponding pin, a base member including a barb for helping engage the contact with the base and an integral spring support means having an opposed pair of transverse arcuate arms each of said arcuate arms having a bent portion bearing against one of the side walls and a terminal end portion which engages one of the slots in one of the side walls of the base, wherein the base further comprises a plurality of buttresses projecting upwardly therefrom for directly supporting the contacts.

5,588,862

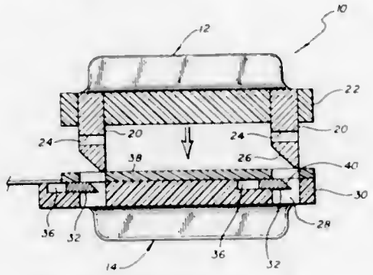
LOCKING MECHANISM

Richard W. Perkins, 13800 Valerio St., Van Nuys, Calif. 91405, and Bradley L. Read, 3905 Division St., Los Angeles, Calif. 90065

Filed Dec. 14, 1994, Ser. No. 364,295

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—347 **6 Claims**



1. A locking mechanism, comprising:

a male base member;

a male connector that has a plurality of male pins that extend from said male base member, each male pin having a locking aperture;

a female connector that has a plurality of female pins that are coupled to a handle by a chassis that is located within a channel of a female base member, said female pins being capable of moving between a engaged position and non-engaged position, said female base member having a plurality of alignment apertures that contain said female pins and receive said male pins so that said female pins are engaged and moved by said male pins so that said female pins become aligned with said locking apertures and slide through said locking apertures to secure said male base member to said female base member;

said handle includes a button that is coupled to said chassis to simultaneously move said female pins when said button is depressed and;

a spring member that is coupled to said button and said chassis to simultaneously push said female pins into said engaged position when said button is released.

5,588,863

LIGHT BULB SOCKET STRUCTURE HAVING A BULB HOUSING WITH ENGAGING MEANS

Hsin-Weih Wu, 5, Lane 193, Kong Yean Road, Chinchu, Taiwan

Filed Sep. 26, 1995, Ser. No. 534,243

Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—356 **1 Claim**

1. An improved light bulb socket structure, comprising:

a longitudinally extended socket shell having a cavity formed therein, said cavity being open on a first end of said socket shell, said first end of said socket shell having a resilient engagement rim formed thereon with a plurality of longitudinally directed slits formed therein, said socket shell including a latch member extending from a second end thereof;

a small light bulb disposed at least partially within said cavity of said socket shell;

a socket cap having a tubular wall defining a cavity extending longitudinally from an open first end of said socket cap for receiving said socket shell therein, said tubular wall having an opening formed therethrough adjacent a partially closed second end of said socket cap for releasable locking engagement with said latch member for securement of said socket shell within said cavity of said socket cap;

a plurality of conductor plates disposed within said cavity of said socket cap for electrical coupling with conductors of said small light bulb; and,

a bulb-shaped outer housing open on one end and releasably coupled to said socket shell, said outer housing having a hollow interior for receiving at least a portion of said small light bulb therein, said open end of said outer housing having a raised flange formed on an outer surface thereof for engagement with said resilient engagement rim.

5,588,864

CONNECTION DEVICE OF A COMPUTER CONNECTOR

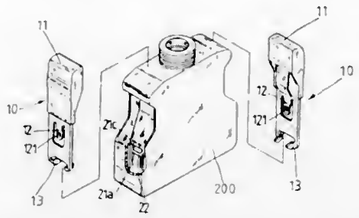
Chao-Tsung Lin, 1st Fl., No. 2, Alley 9, Lane 45, Pao-Hsin Road, Hsin-Tien, Taipei, Taiwan

Filed Mar. 11, 1994, Ser. No. 208,595

Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—357 **1 Claim**

1. A computer connector having a connection device, said connection device comprising:



a clip piece including a metal leaf spring and a press cap fixed to a top of the metal leaf spring, and an insertion socket formed at one side of an inner shell of said computer connector; said metal leaf spring of said clip piece having a bottom end formed with two hooks for firmly hooking on a head portion of a mating computer connector;

said insertion socket is formed at a middle portion of a side wall of said inner shell, wherein said insertion socket includes an insertion plate extending inwardly from an end of said middle portion of said side wall, a stop plate extending upwardly from said sidewall and defining an insertion opening above said insertion plate and a through hole adjacent to said insertion plate;

said clip piece has an inwardly protruding hooking plate at a position corresponding to said insertion plate, such that when said clip piece is inserted into said insertion socket, said hooking plate extends into said through hole and said insertion opening, causing said clip piece to be directly clamped in place between said insertion plate and said stop plate, and wherein said hooking plate includes a detent positioned thereon so that said chip piece is retained firmly in said insertion socket when said clip piece is fully inserted into said insertion socket.

5,588,865

CONNECTOR FASTENING MECHANISM

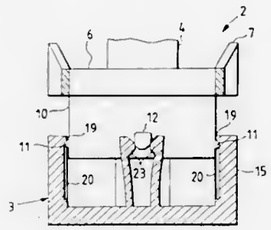
Masayuki Yamamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,776

Claims priority, application Japan, Aug. 20, 1993, 5-226702

Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—364 **6 Claims**



1. A connector fastening mechanism comprising:

a male connector and a female connector fittable with each other by a fastening member in one of a provisional engagement state and a complete engagement state;

engaging means for retaining the male and female connectors against separation in the provisional engagement state; and

elastic means for pressing one of the male and female connectors in a direction to separate the one connector from the other connector in the provisional engagement state.

5,588,866

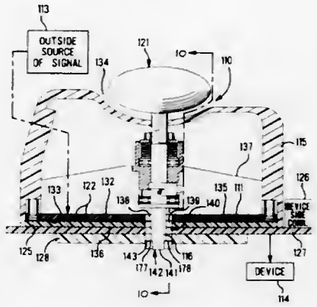
CONNECTOR SYSTEM WITH A ROLLER LATCHING MECHANISM

Richard E. Rothenberger, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 1, 1994, Ser. No. 332,975

Int. Cl.[6] H01R *13/631*

U.S. Cl. 439—372 **9 Claims**



1. In a connector system for electrically mating and unmating opposing surfaces of at least two substrates wherein the surfaces each include a substantial plurality of electrical contact pads, one of said substrates includes an actuator having a leading end extending therebeyond for insertion through an aperture of said second substrate for interlocking means on a leading end of said actuator to cooperate with a camming surface of said second substrate adjacent said aperture, and further having an actuation section remote from said leading end,

wherein upon actuation of the actuator by the actuating section, said interlocking means cinch said first substrate to said second substrate by being urged along said camming surface from a force-free position to a force-applying position, and wherein during actuation substantial friction forces are applied against the interlocking means thereby requiring a substantial rotational torque to be applied to the actuator,

an improvement wherein said interlocking means comprise a pair of rollers secured to said leading end of said actuator, wherein upon actuation of said actuator, said pair of rollers are rotated about at least one roller support pin secured to said actuator and roll along the canning surface with no substantial friction forces from the force-free position to the force-applying position, thereby reducing a rotational torque required to achieve a high-load mechanical and electrical contact between said opposing surfaces of said substrates, over many mating/unmating cycles.

5,588,867

CURVED SOCKET CONTACT

Armand P. Thévenaz, Auliens/Ollon, Switzerland, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 29, 1995, Ser. No. 413,019

Claims priority, application United Kingdom, Apr. 19, 1994, 9407748

Int. Cl.[6] H01R *9/09;13/11*

U.S. Cl. 439—381 **9 Claims**

1. A socket contact comprising a contact body having a longitudinal cavity disposed around and extending along an axis, the cavity for receiving a male contact therein for electrical connection therewith, characterized in that the contact body comprises slots extending from an outer periphery of the body transverse to the axis and intersecting the cavity for allowing supple bending of the contact body in a direction transverse to the axis from a free standing position to a connection position, the contact body being bent into a curved shape in it's connection position, the curvature adapted to receive the male contact inserted into the cavity by

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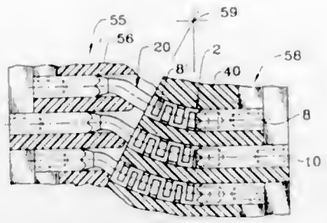


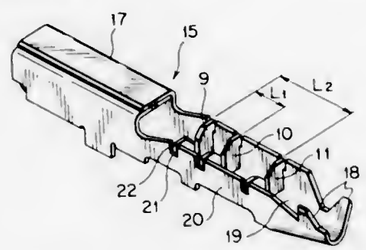
rotational movement in a direction along the axis, wherein adjacent said slots extend respectively from alternating opposing sides of the outer periphery.

5,588,868

STRAND CABLE PRESS-CONTACTING TERMINAL

Masanori Tsuji; Kimihiro Abe; Osamu Sugiyama, and Hiroshi Yamamoto, all of Haibara-gun, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 28, 1995, Ser. No. 412,119
Claims priority, application Japan, Mar. 29, 1994, 6-058538
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—397 **8 Claims**



1. A strand cable press-contacting terminal for connecting thereto a strand cable comprising a plurality of twisted wires aligned in a first external layer of said cable, the plurality of twisted wires having a wire strand pitch, wherein an even number of the plurality of twisted wires are aligned in the first external layer of said cable, said terminal comprising:

a pair of fore and aft press-contacting pieces, arranged longitudinally in the terminal;

wherein said pair of fore and aft press-contacting pieces are spaced apart from each other a distance obtained by multiplying a quarter of the wire strand pitch by an odd number n.

5,588,869

TELECOMMUNICATIONS TERMINAL BLOCK

Michael L. Jensen, Cary; George D. Summers, Jr., Raleigh, and Thomas M. Baum, Apex, all of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 46,339, Apr. 12, 1993, Pat. No. 5,423,694. This application May 1, 1995, Ser. No. 431,936
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—417 **17 Claims**

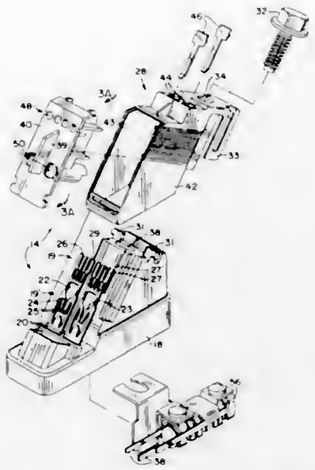
1. A telecommunications terminal block for interconnecting first wires and a second wire, comprising:

a base;

a connector member carried by said base, said connector member having one or more first wire receiving means for receiving and establishing electrical connection with respective ones of said first wires, and also having a second wire receiving means for receiving and establishing electrical connection with said second wire;

wire termination means mounted upon and movable at an angle within the range of approximately 300°–75° relative to a bottom plane of said base for effecting progressive electrical connection of desired ones of said first wires to said connector member without disconnecting the electrical connection of any other of said first wires which were previously connected to said connector member by said wire termination means and disconnecting the electrical connection of said second wire to said connector member; and

drive means for imparting such movement to said wire termination means, said drive means being accessible from a direction oblique to the direction from which said wires access said wire receiving means.

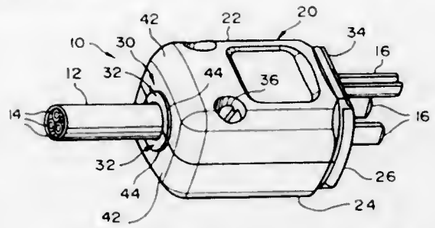


5,588,870

ELECTRICAL CORD CLAMP

William C. Boteler, Bridgeport, and Lawrence J. Klein, Ansonia, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Jun. 7, 1995, Ser. No. 486,162
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—467 **18 Claims**



1. An electrical wiring device adapted to be coupled to an end of an electrical cord with a plurality of electrical conductors, comprising:

a housing including first and second cover halves coupled together to form a cord receiving cavity therebetween, said first and second cover halves having first and second cord clamp engaging surfaces, respectively;

a contact retainer body with terminals coupled to said first and second cover halves for coupling the electrical conductors thereto; and

a cord clamp including a first clamping member movably coupled within said cord receiving cavity along said first cord clamp engaging surface, and a second clamping member movably coupled within said cord receiving cavity along said second cord clamp engaging surface, said first and second clamping members being positioned substantially opposite each other for movably engaging the electrical cord therewith upon installation and assembly of said housing thereon to pull the electrical cord within said cord receiving cavity towards said terminals, each of said first and second clamping members having a spring element for biasing said first and second clamping members away from said terminals,

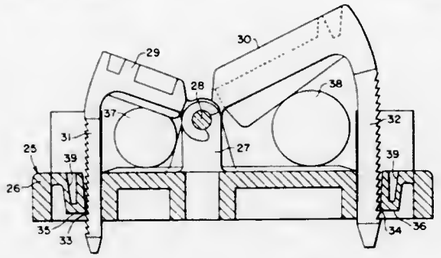
said first and second cord clamp engaging surfaces being first and second substantially smooth, inclined ramps, respectively, which allows said first and second clamping members to freely slide thereon during assembly and disassembly of said housing.

5,588,871

TERMINAL BOX FOR HERMETIC COMPRESSORS

Marco Salvaneschi, Barona di Albuzzano, Italy, assignor to Necchi Compressori S.r.l., Pavia, Italy

Continuation of Ser. No. 145,162, Nov. 3, 1993, abandoned. This application May 8, 1995, Ser. No. 436,595
Claims priority, application Italy, Nov. 3, 1992, PV92U0011
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—469 **5 Claims**



1. A terminal box for a hermetic compressor for connecting electrically feeding lines to electrical components of a refrigerator casing and the compressor and suitable for coupling to a first plate fixed to the compressor, comprising a body, seats formed in an upper part of said body for housing terminals of said feeding lines, locking means in a lower part of said body for fixing said lines to said body and a cover for covering said body, said body having elastic means for removably elastically fixing said body to said first plate and said cover having elastic means for removably elastically fixing said cover to said first plate, said cover being removable from said body while said body remains fixed to said first plate, said locking means for fixing said lines being composed of a second plate having a projection provided with a pivot, two blocks pivotally mounted on said pivot, each said block having an elastic tongue, means on said second plate capable of coupling said elastic tongues with said second plate.

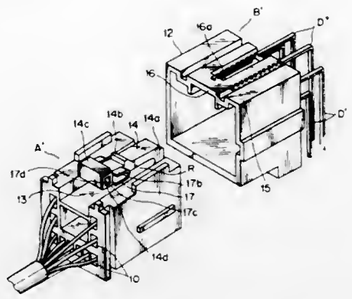
5,588,872

CONNECTOR WITH ENGAGEMENT CHECKING STRUCTURE

Masaru Fukuda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 314,792
Claims priority, application Japan, Sep. 30, 1993, 5-245328
Int. Cl.[6] H01R *3/00*
U.S. Cl. 439—489 **4 Claims**

1. An engagement checking structure for coupled connector housings, comprising:



a first connector housing containing a resilient lock arm integrally formed on said first housing as a cantilever member having one end fixed to a surface of said housing and its other end resiliently movable perpendicularly to said surface.

a locking projection formed on said lock arm.

a second connector housing having an engagement portion cooperable with said locking projection to resiliently urge said lock arm toward said surface of said first connector housing as said connector housings are placed in incomplete engaged relation, and to cooperate with said locking projection to retain said connector housings in locked relation upon said locking arm resiliently returning to its original position when said connector housings are placed in complete engaged relation;

a pair of terminal pins operative for detecting complete engagement between said connector housings and disposed on said second housing in laterally spaced relation from said locking arm upon movement of said first connector housing with respect to said second connector housing; and

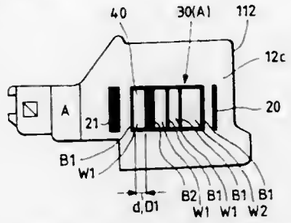
a short circuit contact element mounted on said lock arm, said contact element having contact pieces extending laterally oppositely from said arm and means for attaching said contact element to said arm intermediate said contact pieces, said contact pieces being engageable with said terminal pins when said connector housings are in complete engaged relation whereby electrical connections are made between said contact pieces and said terminal pins.

5,588,873

CONNECTOR ADAPTED FOR FIT DETECTION

Tsuyoshi Hamai, and Norimichi Yashima, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 19, 1995, Ser. No. 545,088
Claims priority, application Japan, Oct. 19, 1994, 6-253614
Int. Cl.[6] H01R *3/00*
U.S. Cl. 439—489 **6 Claims**



1. A connector comprising:

a female housing having a circumferential wall and having a bar code configured by a combination of bars of different colors printed on an outer face; and

a male housing adapted to fit into a fitting hole defined by the circumferential wall of said female housing, said male hous-

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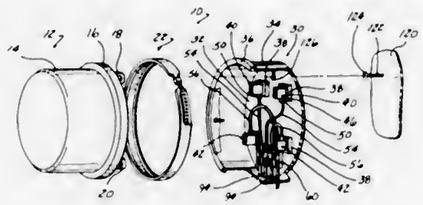
ing having a leading edge portion adapted to reach a desired position in said fitting hole when said male housing and said female housing completely fit together, and having an indicating portion of a color the same as one of said different colors disposed in a portion of a side face of said male housing, said indicating portion adapted to be located adjacent to a slit defined by the circumferential wall of said female housing when said male housing and said female housing completely fit together, the slit extending from said outer face to an inner face, and being formed within an area of a bar of said bar code.

5,588,874

WATTHOUR METER SOCKET ADAPTER FOR REPLACING AN OB WATTHOUR METER

Allen V. Pruehs, Howell; Darrell Robinson, Highland Township, and Robert O. Learmont, Walled Lake, all of Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.

Filed Apr. 7, 1995, Ser. No. 418,824
Int. Cl.[6] H02B *9/00*
U.S. Cl. 439—517 **14 Claims**



1. A watthour meter adapter for a watthour meter having a peripheral mounting flange and a plurality of outwardly extending blade terminals, the watthour meter adapter comprising:

a housing having a bottom wall and an annular side wall extending from the bottom wall to an end mounting flange;

a plurality of jaw contacts mounted on the bottom wall for receiving blade terminals of a watthour meter in a snap-in connection; and

terminal block means, disposed within the peripheral confines of the annular side wall of the housing, for receiving external line and load conductors and internal conductors connected to the jaw contacts.

5,588,875

CONNECTOR

Yoshitsugu Sawada, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

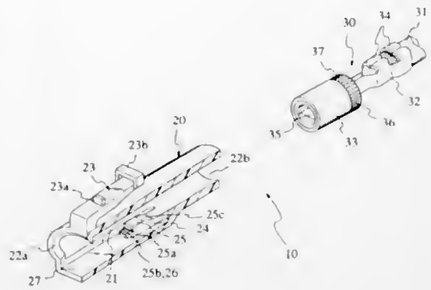
Filed Dec. 19, 1994, Ser. No. 358,515
Claims priority, application Japan, Dec. 20, 1993, 5-320345
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—595 **15 Claims**

1. A connector having:

a connector housing formed with a terminal accommodating chamber and a lance;

a terminal rotatable within and inserted into the terminal accommodating chamber of the connector housing and engaged with the lance for prevention of removal of the terminal from the connector housing; and

terminal rotation preventing means provided on at least one of the lance or the terminal for preventing the terminal inserted into the terminal accommodating chamber of the connector housing from being rotated within the connector housing.

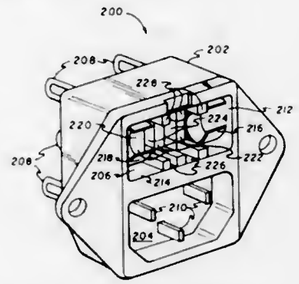


5,588,876

FUSED ELECTRICAL CONNECTORS

Brian B. Hayes, Melbourne, Australia, and Colin J. Hayes, London, England, assignors to Multico International Pty. Ltd., Melbourne, Australia

Continuation-in-part of Ser. No. 142,302, Nov. 23, 1993, Pat. No. 5,413,505. This application May 8, 1995, Ser. No. 437,189
Int. Cl.[6] H01R *13/68*
U.S. Cl. 439—622 **5 Claims**



1. A fused electrical connector comprising:

a body having a fuse receptacle;

spaced apart electrical contacts within said fuse receptacle;

a central block affixed between said electrical contacts, said central block including linear keyways;

a cylindrical fuse for insertion into said fuse receptacle, said fuse having a longitudinal axis and including end caps, each said end cap including an integral elongate connector, each said connector extending substantially perpendicular to said longitudinal axis for engaging one of said electrical contacts upon insertion of said fuse into said fuse receptacle; and

a central body secured to said fuse between said end caps, said central body including linear formations perpendicular to said longitudinal axis of said fuse to permit insertion of said fuse in a direction normal to the longitudinal axis of said fuse.

5,588,877

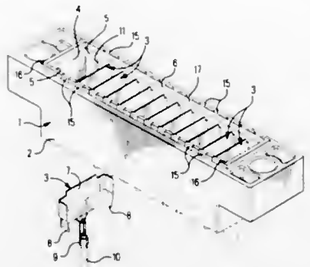
ELECTRICAL CONNECTOR WITH MULTIPLE BLADE CONTACTS

Wayne S. Davis, Harrisburg; Michael E. Shirk, Grantville, and Robert N. Whiteman, Jr., Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 361,608
Int. Cl.[6] H01R *17/00*
U.S. Cl. 439—660 **10 Claims**

1. An electrical connector comprising an insulating housing, an elongated plug receiving single cavity in a mating front of the housing defined between opposed side and end walls, and conductive multiple contacts in the housing, the contacts being spaced apart without insulation therebetween adjacent the mating front, leading portions of the contacts bridging across the single cavity to opposite sides of the single cavity upon insertion into said housing from an insertion face opposed to said mating front, and

opposed side portions of Said contact leading portions extend to opposed side edge portions through transverse slots in said cavity side walls extending to closed front ends adjacent said mating front, said side edge portions having resilient lances latched forwardly of latching surfaces defined in walls of said slots facing and remote from said mating front of said housing along opposite sides of said single cavity whereby said contacts are latchingly retained within said housing.

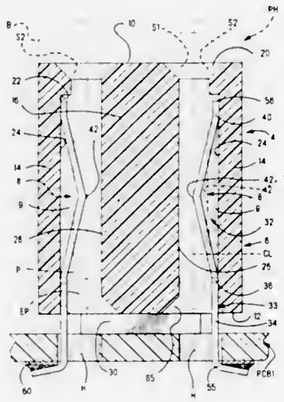


5,588,878

ELECTRICAL RECEPTACLE ASSEMBLY AND SPRING CONTACT THEREFOR

Bernadette M. Flinchbaugh, York Haven; Andrew J. Gabany, Mechanicsburg; Adrian L. Melnyk, York, and Christopher J. Schmid, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 14, 1995, Ser. No. 404,410
Int. Cl.[6] H01R *13/10*
U.S. Cl. 439—682 **20 Claims**



1. An electrical receptacle assembly for application to a printed circuit boar, the assembly comprising:

an insulating housing having a rectangular cross section defining at least one row of contact receiving cavities each opening into first and second opposite external faces of the housing, each cavity having a contact receiving part of constant cross section and being defined by first, second, third and fourth orthogonally arranged, flat, elongate surfaces extending substantially from the first opposite external face of the housing to a position proximate to the second opposite external face of the housing; and

a spring contact in each cavity comprising a bowed, forward leaf contact spring extending from an intermediate planar retention portion having oppositely projecting retention ears, and a rearward contact tail extending from the retention portion, the retention portion being secured against the first flat surface by the retention ears, that extend into contact retention slots in communication with said first opposite external face, said contact retention slots coextending laterally along said first flat surface and into said second and third flat surfaces that are adjacent to said first and fourth flat surfaces, the contact tail projecting from the first external opposite face of the housing and the contact spring being bowed away from said first flat surface toward the fourth flat surface with a forward free ended portion of the contact spring engaging the first flat surface,

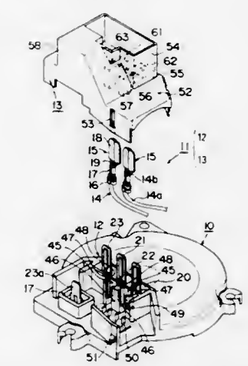
whereby an electrical pin inserted axially into said cavity to engage against the fourth flat surface will depress the contact spring toward the first flat surface.

5,588,879

DIRECT COUPLER DEVICE

Masami Kano, Kiryu, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Dec. 23, 1994, Ser. No. 363,418
Claims priority, application Japan, Dec. 28, 1993, 5-074853 U
Int. Cl.[6] H01R *13/502*
U.S. Cl. 439—686 **12 Claims**



1. A direct coupler device wherein a lead wire connected to a brush of a motor is electrically connected to an electricity supplying wire of a wire harness through a female coupler and a male coupler, said direct coupler device comprising:

a male coupler including a main portion and a cap covering said main portion, said main portion having a recess and also having a bottom side and a top side,

a terminal having a male terminal portion and an end portion opposite to said male terminal portion, which end portion of said terminal is connected to an end portion of said lead wire,

said terminal being received in said recess with said lead wire positioned at said bottom side of said male coupler; and

a part of said terminal being engaged with said cap whereby said terminal is held to and prevented from coming out of said male coupler by movement in the direction toward said cap.

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5,588,880

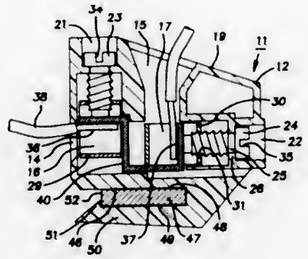
TERMINAL BLOCK

Daniel P. Wood, Laurel Hill, N.C., assignor to Acme Electric Corporation, East Aurora, N.Y.

Filed Mar. 10, 1995, Ser. No. 401,722

Int. Cl.[6] H01R *9/22*

U.S. Cl. 439—709 **12 Claims**



1. A finger-safe terminal block including:

an insulator base having an exterior surface including a support surface to support said terminal block on a mount;

a cantilever arm on said base adapted to engage an opposite surface of the mount for the terminal block;

first and second screw apertures in the exterior surface of said insulator base;

first and second rotatable screws in said first and second screw apertures, respectively, leading to first and second clamp areas, respectively, of said insulator base;

first and second conductor apertures in said insulator base adapted to receive first and second external conductors therein, respectively;

said first and second conductor apertures leading from the exterior surface to said first and second clamp areas, respectively, of said base;

each screw having a tool access end accessible from the exterior surface of the base, wherein tightening of each screw is adapted to physically clamp an end of an external conductor in the respective clamp area;

said first and second screw apertures at the base exterior surface being sufficiently small and each screw being mounted in a respective screw aperture with the tool access end recessed from the base exterior surface sufficiently that it cannot be touched by an adult human's finger tip; and

a conductor in said insulator base to provide electrical connection between said first and second clamp areas at least when the screws are tightened.

5,588,881

CONNECTOR TERMINAL BLOCK WITH ELECTRONIC MODULE

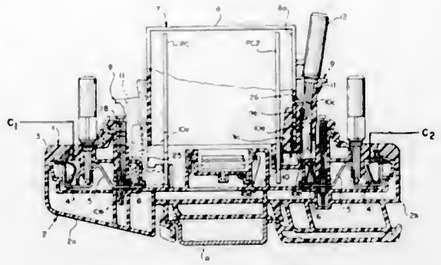
Gerhard Eggert; Walter Hanning, both of Detmold; Uwe Fiene, Steinheim; Michael Schnatwinkel, Herford; Rudolf Steinmeier, and Manfred Wilmes, both of Detmold, all of Germany, assignors to Weidmueller Interface GmbH & Co., Detmold, Germany

Filed Oct. 18, 1995, Ser. No. 544,482

Claims priority, application Germany, Oct. 31, 1994, 44 38 800.4

Int. Cl.[6] H01R *9/22*

U.S. Cl. 439—709 **10 Claims**



1. Terminal block means for supplying electrical power to, and for testing the operation of, an electronic plug-in module such as a printed circuit board, comprising:

(a) terminal block means (**1**), including:

(1) a terminal block body (**2**) formed of insulating material;

(2) at least one main electrical terminal (**4,4'**) mounted on said terminal block body;

(3) at least one auxiliary electrical terminal (**6,6'**) mounted on said terminal block body in spaced relationship relative to said main terminal; and

(4) at least one electrical connecting means (**5,5'**) connecting said auxiliary terminal with said main terminal;

(b) electronic module means (**7**) removably mounted on said terminal block body, said module means including:

(1) a hollow housing (**8**) having a generally planar wall portion (**8a**); and

(2) at least one electronic component (**PC1, PC2**) mounted in said housing; and

(c) disconnect means for alternately electrically connecting and disconnecting said electronic component with respect to said auxiliary terminal, including:

(1) a disconnect body member (**9, 9'**) movably connected with said housing wall portion for displacement between engaged and disengaged positions relative to said auxiliary terminal; and

(2) disconnect terminal means (**10, 10'**) mounted on said disconnect body member for electrically connecting said auxiliary terminal with said electrical component when said disconnect body member is in said engaged position, said disconnect terminal means being disconnected from said auxiliary terminal when said disconnect body is in the disengaged position.

5,588,882

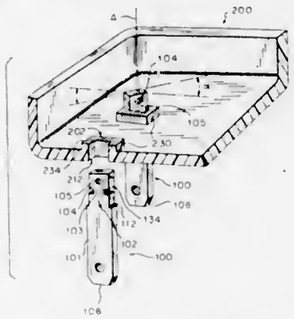
WALL SOCKET WITH TWIST LOCK PRONGS

Ng Y. Hung, Kowloon, Hong Kong, assignor to Helms-Man Industrial Co., Ltd., Kowloon, Hong Kong

Filed Apr. 28, 1995, Ser. No. 431,050

Int. Cl.[6] H01R *13/415*

U.S. Cl. 439—741 **6 Claims**



1. A system for fixing an electrical contact prong through a housing wall such that the prong may conduct electricity through the housing wall, comprising:

a slot in the housing wall having a generally constant rectangular slot cross section, the slot passing through the wall from a housing outer surface of the housing wall to a housing inner surface of the wall, the outer surface of the housing wall and the inner surface being separated by a thickness of said wall; and

an elongated prong having a length and further comprising

a main body portion for making electrical contact outside the housing and having a body cross section larger than the slot cross section in at least one dimension,

a neck portion disposed along the length of the prong adjacent the body portion and having a generally rectangular neck cross section substantially equal to the slot cross section,

a head portion, disposed along the length of the prong adjacent the neck portion and distal the body portion, the head portion having a head cross section no larger than the neck cross section such that the head portion may pass through the slot, and

a twist portion disposed along the length of the prong intermediate the neck portion and the head portion and having a twist cross section substantially less in area than the head cross section, such that the twist portion is weaker in torsion along the length of the prong than other portions of the prong;

a shoulder formed by a first cross-sectional discontinuity of the neck cross section and the body cross section;

a chin formed by a second cross-sectional discontinuity of the twist portion and the head portion;

a distance from the shoulder to the chin being substantially equal to the thickness of said wall;

whereby when the prong is inserted into the slot, the shoulder abuts the outer surface of the housing, the head may be twisted relative to the neck about the length of the prong so that the chin abuts the inner surface of the housing, such that the neck portion is held firmly within the slot between the shoulder and the chin.

5,588,883

CONNECTOR

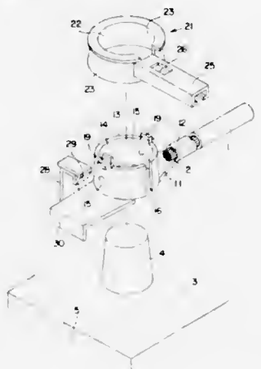
Kazuhiko Hattori, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed May 9, 1995, Ser. No. 437,365

Claims priority, application Japan, Jun. 3, 1994, 6-145511

Int. Cl.[6] H01R *4/30*

U.S. Cl. 439—761 **10 Claims**



1. A device for connection to a post comprising a fastening ring having a fastening internal diameter and adapted to surround said post, an outer ring adapted to surround said fastening ring and rotate between an initial position, wherein no inward pressure is exerted on said fastening ring, and a tightened position, wherein inward pressure is exerted on said fastening ring, said inward pressure causing said fastening diameter to decrease and said fastening ring to grip said post,

a lever extending radially outwardly, on said outer ring, said lever adapted to rotate said rotatable ring between said initial position and said tightening position,

a locking mechanism adapted to retain said lever in said tightened position,

said locking mechanism comprising an engaging hole in said lever, a hook mounted on said fastening ring and complementary to said hole when said outer ring is in said tightened position, so that said hook enters said hole in said tightened position.

5,588,884

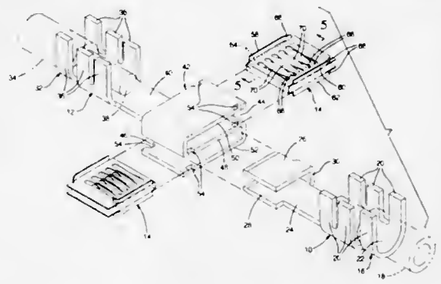
STAMPED AND FORMED CONTACTS FOR A POWER CONNECTOR

Edward Rudoy, Woodland Hills, and John S. Szalay, Corona Del Mar, both of Calif., assignors to Packard Hughes Interconnect Company, Irvine, Calif.

Filed Sep. 8, 1995, Ser. No. 525,469

Int. Cl.[6] H01R *13/187*

U.S. Cl. 439—845 **4 Claims**



1. A power connector system comprising:

a pin contact, a socket contact and a spring member;

said pin contact comprising a termination end for attachment to a wire, a transition section extending from the termination end, and two blades extending from the transition section and wherein said blades are connected by a U-shaped bridge;

a socket contact having a termination end for attachment to a wire, a transition section extending from the termination end, and a socket component connected to the transition section, said socket component having a body portion and two arms extending outward in opposite directions therefrom, each arm having a pair of opposed notches formed near one end of the arm and a pair of opposed notches formed near the other end of the arm, said body and arms being constructed and arranged to define two U-shaped cavities;

a U-shaped spring member received in each of said cavities and constructed and arranged to provide a frictional fit when said blades are inserted into the respective cavities.

5,588,885

CONNECTOR WITH TERMINALS HAVING ANTI-WICKING GEL

Klaus P. Götz, Lorsch; Manfred Schaarschmidt, Bensheim, and Günter Feldmeier, Lorsch, all of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 362,312

Claims priority, application United Kingdom, Feb. 1, 1994, 9401918

Int. Cl.[6] H01R *4/20;9/09*

U.S. Cl. 439—876 **6 Claims**

1. An electrical connector comprising an insulative housing with terminal receiving cavities extending therethrough from a mounting face to a terminal receiving face, and electrical terminals

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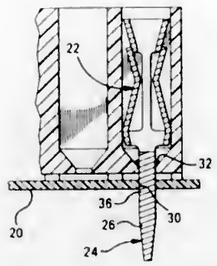
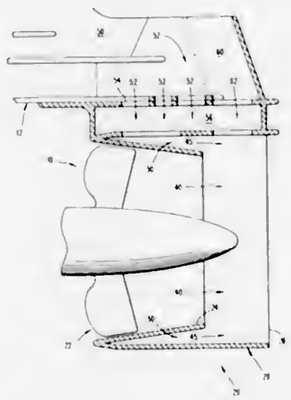


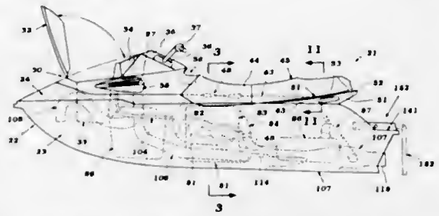
having contact tails, the terminals mountable in the terminal receiving cavities of the housing such that the contact tails project below the mounting face, wherein the contact tails have sealing material deposited thereon prior to mounting in the terminal receiving cavities and wherein the terminal receiving cavities comprise contact tail receiving cavity sections proximate the mounting face, the contact tail receiving cavity sections having a smaller periphery than the sealing material such that the sealing material is squeezed between the contact tails and contact tail receiving cavity sections for hermetic sealing therebetween when the terminals are mounted in the housing.

5,588,886
AIR ENCIRCLING MARINE PROPULSION APPARATUS
Grover W. Davis, 3024 Kings Harbor Rd., Panama City, Fla. 32405
Continuation of Ser. No. 262,884, Jun. 21, 1994, Pat. No. 5,482,482. This application Jan. 5, 1996, Ser. No. 583,661
Int. Cl.[6] B63H *1/16*
U.S. Cl. 440—67 **6 Claims**



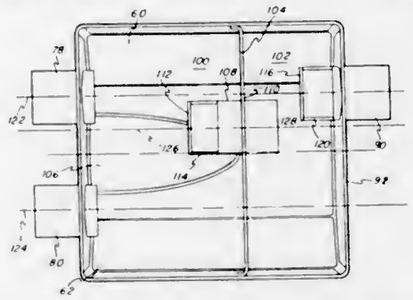
1. An apparatus for increasing thrust in marine propulsion, comprising:
a first hollow body having a guiding surface to guide a propulsive stream of water and having an outlet, a portion of the guiding surface radially converging toward the outlet;
a second hollow body disposed to surround at least a portion of the first body including the outlet to form a space surrounding first body, the second hollow body extending in the flow direction beyond the outlet; and,
duct means for guiding air into the space surrounding the first body to form a blanket of air surrounding the outlet of the first body.

5,588,887
WATERCRAFT
Keijiroh Ikeda, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Continuation of Ser. No. 231,337, Apr. 22, 1994, Pat. No. 5,490,474. This application Jun. 7, 1995, Ser. No. 475,172
Claims priority, application Japan, Apr. 27, 1993, 5-100954; Apr. 28, 1993, 5-103100
Int. Cl.[6] B63H *21/10*
U.S. Cl. 440—88 **5 Claims**



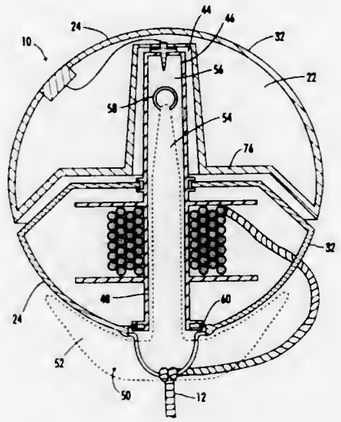
1. A watercraft having a hull defining an engine compartment, an internal combustion engine supported within said engine compartment for driving a propulsion unit for propelling said watercraft, said engine being comprised of a crankcase chamber formed at a lower portion of said engine and a cam chamber formed above said crankcase chamber and at an upper portion of said engine, a lubricant drain for draining lubricant from said cam chamber to said crankcase chamber, and means for reducing the amount of lubricant that can flow through said drain from said crankcase chamber to said cam chamber when said watercraft is inverted and said crankcase chamber is disposed above said cam chamber.

5,588,888
WET MARINE EXHAUST MUFFLER
Walaa Magharious, Thomasville, Ga., assignor to Centek Industries, Inc., Thomasville, Ga.
Filed Oct. 10, 1995, Ser. No. 541,802
Int. Cl.[6] B63H *20/24;21/32*
U.S. Cl. 440—89 **12 Claims**



1. A marine muffler for attenuating noise in a marine exhaust stream comprising exhaust gas and cooling water, said marine muffler comprising a housing, a baffle plate means positioned in said housing for dividing said housing into an upstream expansion chamber and a downstream exhaust chamber, inlet means in said expansion chamber for communicating with said marine exhaust stream, said baffle plate means comprising a bore formed therethrough, a baffle tube positioned in said bore and providing communication between said upstream expansion chamber and said downstream exhaust chamber, said baffle tube comprising a closed end portion extending into said expansion chamber and an open end portion disposed in said exhaust chamber, said baffle tube comprising swirl inlet means contiguous with said closed end of said baffle tube for imparting a swirling motion to said marine exhaust stream, said baffle tube swirl inlet means including a notched radially extending opening, said baffle tube further including an imperforate tubular wall extending from said swirl inlet means along said baffle tube to said open end portion, said exhaust chamber comprising exhaust tube means therein for exhausting said stream from said exhaust chamber to a surrounding atmosphere, said exhaust tube means including an upstream end thereof extending into said exhaust chamber and a downstream exit end, said upstream end thereof comprising a closed end portion and an exhaust tube inlet means contiguous with said closed end for imparting swirling motion to said exhaust stream as it is exhausted to said surrounding atmosphere.

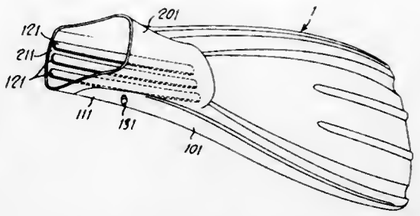
5,588,889
TIMING BUOY WITH REMOTE TIMING CAPABILITY
Scott D. Easter, 322 N. Birchwood, Hendersonville, Tenn. 37075
Continuation-in-part of Ser. No. 432,572, May 1, 1995. This application Aug. 7, 1995, Ser. No. 512,121
Int. Cl.[6] B63B *22/18*
U.S. Cl. 441—1 **19 Claims**



1. A timing buoy for watercraft sports, comprising:
a shell configured to operably receive and operably withstand contact forces;
a timing device;
a switch operably attached to the shell enabling the switch to be actuated in response to contact forces applied to the shell;
connection means for transmitting an actuation signal from the switch to a transmitter in response to a contact force applied to the shell; and
wherein the transmitter is configured to send a signal to a remote receiver enabling the receiver to actuate the timing device in order to operably start or stop the timing device in response to a contact force applied to the shell.

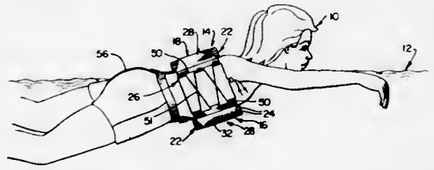
5,588,890
SWIMMING FIN
Giovanni Garofalo, Rapallo, Italy, assignor to HTM Sport S.p.A., Italy
Filed May 10, 1995, Ser. No. 438,912
Claims priority, application Italy, May 20, 1994, GE94A0062
Int. Cl.[6] A63B *31/11*
U.S. Cl. 441—64 **8 Claims**

1. Swimming fin of the type having an open shoe comprising:
a shoe portion having a sole, and a blade portion, wherein
a top interior surface of said sole is provided with two or more longitudinal ribs,



said shoe portion is of a flexible material and said blade portion is of a relatively stiffer material,
said blade portion extends underneath the top interior surface of said sole of said shoe portion to form a sole part, and
said ribs are formed on said sole part, from which they project into an interior of the said shoe portion.

5,588,891
SWIM TRAINING DEVICE
James P. Bardot, 302 Cozumel, Laguna Beach, Calif. 92651
Filed Jan. 22, 1996, Ser. No. 589,422
Int. Cl.[6] B63C *9/115*
U.S. Cl. 441—115 **8 Claims**



1. An improved swim training device arranged to be worn about the upper torso of a swim trainee, said training device being defined by a pair of buoyancy units comprising:
a jacket formed from a single sheet of material that is arranged to define a storage compartment;
a plurality of floatational cells removably stored in said storage compartment so as to sequentially control the buoyancy of each of said buoyancy units;
said storage compartment being defined by an inner cover sheet arranged to engage the body of the swim trainee, wherein said inner cover sheet includes four peripheral edges with each edge formed having an outwardly extended flap member so as to define a free end with an eyelet formed therein;
means for removably securing said floatational cells in said jacket;
means for adjustably positioning said extended flap members over said floatational cells, as said floatational cells are selectively removed from within said storage compartment; and
means for attaching said pair of buoyancy units to each other, said attaching means further defining means for securing said training device about the body of the wearer thereof.

5,588,892
COMBINATION FLOTATION DEVICE AND SWIMMING AID
Donna McMahon, Stuart, Fla., assignor to Donna McMahon, Inc., Stuart, Fla.
Filed Oct. 4, 1995, Ser. No. 538,862
Int. Cl.[6] B63C *9/115*
U.S. Cl. 441—116 **16 Claims**

1. A personal flotation device for providing support and lift to the wearer's body, face and head while in a body of water, comprising:

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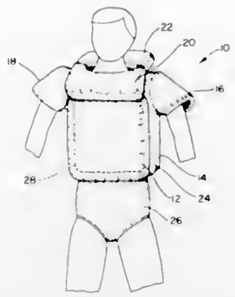


an anterior flotation panel portion and an opposing posterior flotation panel portion, the flotation panel portions being generally parallel with each other;

a first shoulder flotation portion and an opposing second shoulder flotation portion, the shoulder flotation portions being at the top of and extending tangentially from the flotation panel portions;

an anterior collar flotation portion and an opposing posterior collar flotation portion, the anterior collar flotation portion extending forward and tangentially from the top of the anterior panel flotation portion, the posterior collar flotation portion extending rearward and tangentially from the top of the posterior flotation panel portion;

the collar flotation portions being hinged together so that the collars may pivot to provide support to the wearer's face and head in relation to the water level line.

5,588,894

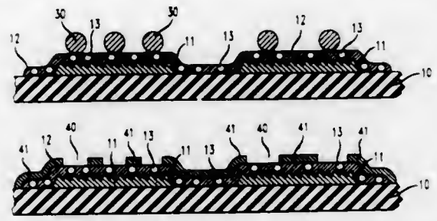
FIELD EMISSION DEVICE AND METHOD FOR MAKING SAME

Sungho Jin, Millington; Gregory P. Kochanski, Dunellen, and Wei Zhu, North Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 299,674, Aug. 31, 1994. This application Oct. 26, 1995, Ser. No. 548,533

Int. Cl.[6] H01J *9/02*

U.S. Cl. 445—24 **13 Claims**



1. A method for making a field emission device comprising the steps of:

applying a layer of electron emitter material on a substrate;

applying masking particles to said emitter material;

applying over said masking particles and said emitter material successive layers of insulating material and conductive material;

removing said masking particles to reveal underlying apertures to the emitter material; and

finishing said device.

5,588,893

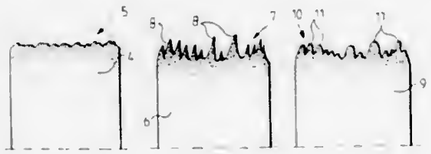
FIELD EMISSION CATHODE AND METHODS IN THE PRODUCTION THEREOF

V. S. Kaftanov; A. L. Suvorov, and E. P. Sheshin, all of Moscow, Russian Federation, assignors to Kentucky Research and Investment Company Limited, Tortola, Virgin Islands (Br.)

Filed Jun. 6, 1995, Ser. No. 467,825

Int. Cl.[6] H01J *9/02*

U.S. Cl. 445—6 **7 Claims**



1. A method in the production of a field emission cathode constituted by at least one body containing a first substance, said method comprising the steps of

preparing said at least one body so as to provide it with at least one emitting surface (emitting surfaces) having irregularities facilitating electron field emission;

adding to said emitting surface a second substance with a lower work function than that of said first substance, in order to lower the electrical field strength required to induce electron field emission from said emitting surface; and

modifying said emitting surface by applying to said at least one body a variable electric field, in order to induce electron field emission from said emitting surface, and increasing said variable electric field, in such a manner that the deterioration of said irregularities of said emitting surface is limited.

5,588,895

ANGEL ACTION FIGURE DOLL

Diana A. Larson, R.R. 1 Box 33B, Mt. Ayr, Iowa 50854

Filed Nov. 17, 1995, Ser. No. 559,233

Int. Cl.[6] A63H *3/08;33/22;3/46*

U.S. Cl. 446—98 **5 Claims**

1. An angel action figure doll comprising:

a) a small adjustable mannequin, said small adjustable mannequin being in the form of a human being and including a torso having a neck, shoulders and hips, a head that swivels on the neck of said torso, a pair of jointed arms that extend outwardly from the shoulders of said torso, and a pair of jointed legs that extend downwardly from the hips of said torso, each said jointed arm including a star elbow joint assembly between a forearm segment and upper arm segment thereof, each said jointed leg including a star knee joint assembly between a shank segment and thigh segment thereof, each said jointed leg including a star ankle joint assembly between a boot segment and a shank segment thereof said small adjustable mannequin being fabricated out of a semi-soft plastic material;

b) a wing assembly, said wing assembly including a pair of upper wings, and pair of lower wings;

c) means for mounting said wing assembly against a back of said small adjustable mannequin, said mounting means including a breastplate having a collar to be worn about a neck and shoulders of said small adjustable mannequin, a back plate having a tail, three star swivel assemblies for attaching a pair of upper wings and a pair of lower wings of said wings assembly to said back plate in a moveable manner, and a star connector assembly for securing said back plate to the collar of said breastplate,

d) a halo worn on a head of said small adjustable mannequin, to simulate a conventional representation of an immortal, which can be used as a plaything of a child, said halo carrying a small star and being fabricated out of an elastic material that glows in the dark;

e) a toga worn by said small adjustable mannequin.

5,588,896

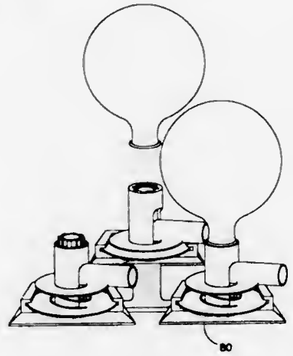
TOY BALLOON INFLATION AND EJECTION DEVICE

Gregory L. Goodman, 303 E. 37th St. Apt. 6B, New York, N.Y. 10016

Filed Aug. 25, 1995, Ser. No. 519,545

Int. Cl.[6] A63H *27/26;3/06*

U.S. Cl. 446—187 **14 Claims**



1. A toy device for inflating and ejecting a balloon having a bead, comprising:

(a) support means having two ends and a surface area on one of said ends to which the balloon will frictionally adhere when the bead is stretched open and pulled over, said surface area having intermittent indentations where the bead will not come into contact with said support means;

(b) inflation means connected to said support means to permit air to be blown into the balloon and maintained therein; and

(c) ejection means having intermittent projections in close proximity to said support means surface area in alignment with the intermittent indentations in said surface area, each of said projections having a surface area disposed perpendicular to said support means surface area, and said ejection means being movable so as to bring said projection surface areas into contact with the bead and to urge the bead off said support means.

5,588,897

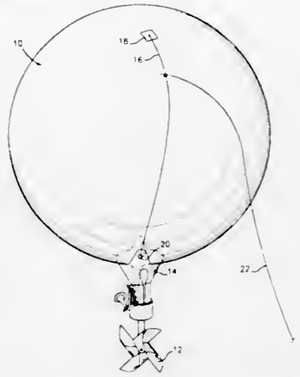
BALLOON WITH CONNECTED PINWHEEL

George Valentino, 2667 Rockaway Ave., Oceanside, N.Y. 11572

Continuation of Ser. No. 86,336, Jul. 1, 1993, Pat. No. 5,395,276. This application Mar. 7, 1995, Ser. No. 400,981

Int. Cl.[6] A63H *33/40*

U.S. Cl. 446—217 **12 Claims**



1. An adaptor and pinwheel for use in releasably attaching to a balloon to form an aerial toy, said adaptor and pinwheel including:

a flared upper portion for engaging and retaining said balloon;

a cylindrical center portion with first and second ends and being attached to said upper portion at said first end, said center portion including a first closed end slot for receiving a stem from said balloon and a second closed end slot for engaging and sealing the end of said stem to prevent the escape of gas from said balloon; and

a removable lower portion adapted to engage and attach to the cylindrical center portion at said second end to lock the stem of said balloon within said second closed slot, said lower portion including said pinwheel.

5,588,898

DOLL TOY HEAD ROTATION DEVICE

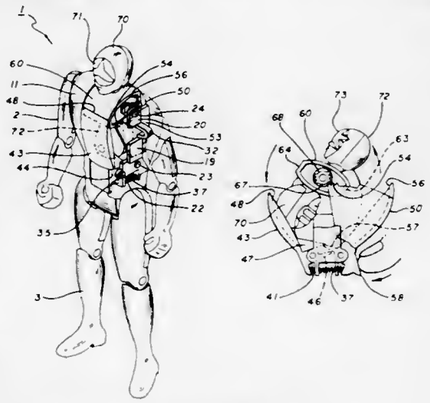
Hideki Ooba, Tokyo, Japan, assignor to Kabushiki Kaisha Plex, Japan

Filed Oct. 12, 1995, Ser. No. 542,305

Claims priority, application Japan, Mar. 10, 1995, 7-079929

Int. Cl.[6] A63H *3/12*

U.S. Cl. 446—321 **9 Claims**



1. A doll toy head rotation device wherein:

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(a) there is provided a hollow torso part and a front opening is provided in the front of the torso part, an upper opening is provided in the top of the torso part and a rear opening is provided in the rear of the torso part, the front opening being continuous with the upper opening and the upper opening being continuous with the rear opening;

(b) a front plate which opens and closes the front opening is mounted in the front opening open/closably about its lower portion, a rear plate which opens and closes the rear opening is mounted in the rear opening open/closably about its lower portion, and an upper plate which opens and closes the upper opening is mounted in the upper opening rotatably about its substantially central portion;

(c) the upper plate has an upper head part mounted on its upper surface and a lower head part mounted on its lower surface;

(d) the front plate and the rear plate are so linked to each other that they open substantially simultaneously; and

(e) the upper plate is provided with a rotary body having the rotational center of the upper plate as its center; and

(f) the front plate or the rear plate is provided with a pivoting member which after that plate opens through a predetermined angle rotates the rotary body and does not rotate the rotary body when the plate closes.

5,588,899

APPARATUS FOR GRINDING SPECTACLE LENSES

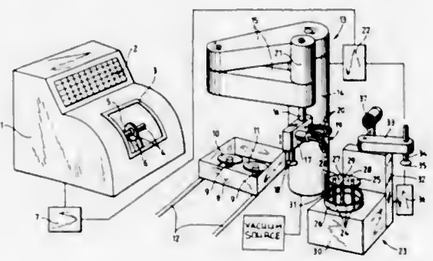
Lutz Gottschald, Meerbusch, Germany, assignor to Wernicke & Co. GmbH, Düsseldorf, Germany

Filed Apr. 28, 1995, Ser. No. 433,247

Claims priority, application Germany, Apr. 28, 1994, 44 14 784.8

Int. Cl.[6] B24B *49/00*

U.S. Cl. 451—5 **11 Claims**



1. An apparatus for peripheral grinding of a lens; said apparatus comprising:

at least one CNC-control device for grinding the lens blank according to a selected contour of the lens to be produced from the lens blank, said CNC-control device comprising:

a) at least one grinding wheel,

b) at least one rotatable holder for a lens blank,

c) at least one input device for inputting the optical specifications of the lens to be produced, and

d) a controller for controlling grinding of the lens blank according to the selected contour;

at least one manipulation device for receiving and positioning the lens blank according to the optical specifications;

an opto-electronic detecting device for detecting markings of the lens blank, said opto-electronic detecting device arranged in the vicinity of said manipulation device; and

a first control unit, controlling said detecting device, and a second control unit, controlling said manipulation device, said first and said second control units cooperating for precisely positioning the lens blank on said holder.

5,588,900

SURFACE TREATING DEVICE

Fukashi Urakami, Yokohama, Japan, assignor to Urakami Research & Development, Kanagawa, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

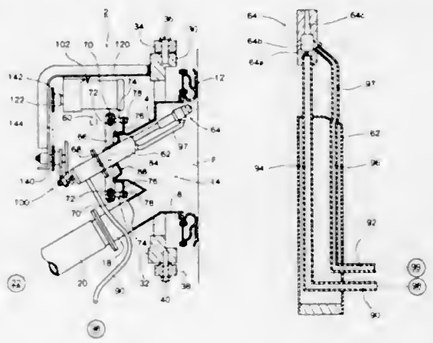
PCT No. PCT/JP94/00797, § 371 Date Jan. 18, 1995, § 102(e) Date Jan. 18, 1995, PCT Pub. No. WO94/27784, PCT Pub. Date Dec. 8, 1994

PCT Filed May 18, 1994, Ser. No. 373,246

Claims priority, application Japan, May 23, 1993, 5-156025

Int. Cl.[6] B24C *3/06*

U.S. Cl. 451—92 **6 Claims**



1. A surface treating device having a nozzle for ejecting a surface treating material toward the surface of an object, which comprises

a swivel bearing mechanism, an oscillating tube connected to the swivel bearing mechanism so as to be free to pivot about an axis center of the swivel bearing mechanism and such that with respect to the axis center, an end portion thereof is positioned on the side facing the object surface and the other end portion thereof is positioned on the side opposite to the object surface, the nozzle connected to the one end portion side of the oscillating tube, and a self-revolving/else-revolving mechanism connected to the other end portion side of the oscillating tube and making the nozzle self-revolve and else-revolve about the axis center of the swivel bearing mechanism,

the self-revolving/else-revolving mechanism including a main crank which has a driven shaft positioned on an axis passing through the axis center of the swivel bearing mechanism on the other end portion side of the oscillating tube and rotationally driven by driving means, and which is rotationally driven integrally with the driven shaft; a subordinate crank having a rotating shaft mounted at a site eccentric from the axis of the main crank and having an axis obliquely intersecting the axis of the main crank; universal joint means connecting that site in the subordinate crank which is eccentric from the axis, to the other end portion side of the oscillating tube; a subordinate bevel gear connected to the rotating shaft of the subordinate crank and rotating integrally with the subordinate crank; a main bevel gear which is provided integrally on a shaft having an axis common to the driven shaft of the main crank and being disposed so as to be free to rotate relative to the driven shaft, and which is engaged with the subordinate bevel gear; and the subordinate bevel gear revolving about the main bevel gear according to the rotation of the main crank while revolving on its own axis.

5,588,901

CLEANING METHOD AND APPARATUS UTILIZING SODIUM BICARBONATE PARTICLES

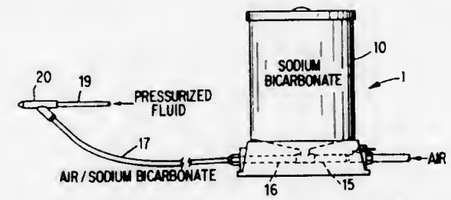
Arthur C. Rubey, III; Andrew M. Taylor, both of San Antonio, Tex., and William E. Spears, Jr., Lawrenceville, N.J., assignors to Yelapa Corporation, San Antonio, Tex.

PCT No. PCT/US94/09638, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO95/06526, PCT Pub. Date Mar. 9, 1995

Continuation-in-part of Ser. No. 116,405, Sep. 3, 1993, Pat. No. 5,366,560. This PCT application Aug. 31, 1994, Ser. No. 351,310

Int. Cl.[6] B24C *1/00;3/02;7/00;9/00*

U.S. Cl. 451—99 **17 Claims**



1. Apparatus for cleaning a surface by blasting the surface with particles of abrasive entrained in a high velocity fluid stream comprising, in combination:

a hopper for containing abrasive particles, said hopper having a top and a tapered bottom surface terminating in a vertical passage, the top of said hopper being exposed to atmospheric pressure;

an orifice element removably mounted in said vertical passage defining an orifice bore of selected diameter to allow passage of the abrasive particles therethrough;

an air pipe having a first end and a second end;

a bore transversely intersecting said vertical passage below said orifice element, said transversely intersecting bore being disposed to receive abrasive particles passing through said orifice bore, said transversely intersecting bore being further disposed in communication with said air pipe;

said first end of said air pipe communicating with atmospheric air, said first end of said air pipe being disposed upstream of said transversely intersecting bore;

an applicating nozzle;

means defining a venturi passage connected to said applicating nozzle,

first hose means for supplying a stream of pressurized fluid through said venturi passage;

means defining a suction fluid passage communicating with said venturi passage to produce a suction force; and

second hose means connecting said suction fluid passage to said second end of said air pipe.

5,588,902

APPARATUS FOR POLISHING WAFERS

Hiroyoshi Tominaga, and Yoshinori Suzuki, both of Fukushima-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1995, Ser. No. 387,514

Claims priority, application Japan, Feb. 18, 1994, 6-044839

Int. Cl.[6] B24B *5/00*

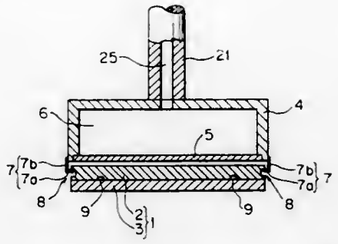
U.S. Cl. 451—288 **17 Claims**

1. An apparatus for polishing wafers comprising:

a polishing apparatus having a top ring mounted on a rotary shaft;

a wafer carrier made from a material with high rigidity for adhering wafers thereto, the wafer carrier composed of two plates including an upper plate and a lower plate which are superimposed with each other in tight adhesion, said upper plate being mounted to a lower portion of the top ring of the polishing apparatus, a total thickness of the two plates being sufficient to prevent the plates from becoming deformed by a polishing load; and

a flexible thin plate secured to the lower portion of the top ring so as to form a sealed space within the top ring, the sealed space being in communication with a source of pressurized fluid and the upper plate being spaced apart and below a lower surface of the thin plate.



5,588,903

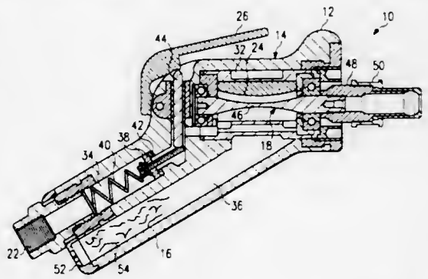
ERGONOMIC POWER TOOL

Robert A. Pennison, Bellville, Tex., assignor to Indresco Inc., Dallas, Tex.

Filed Aug. 8, 1994, Ser. No. 287,543

Int. Cl.[6] B24B *23/00;27/08*

U.S. Cl. 451—344 **8 Claims**



1. An ergonomic hand-held air powered tool comprising:

a motor;

a drive assembly coupled to the motor and having a first longitudinal axis;

a housing comprising:

a main body portion forming a cavity and having the motor secured in the cavity, and

a handle portion attached to the main portion and having a second longitudinal axis;

a chuck coupled to the drive assembly for releasably securing a tool element to the drive assembly;

a throttle associated with the motor for selectively controlling the speed of the motor, the throttle comprising:

a throttle valve comprising:

a biasing spring having a first end abutting a portion of the housing;

a valve seat;

a valve flange abutting a second end of the biasing spring for urging the valve flange towards the valve seat; and

linkage connected to a portion of the valve flange for causing the valve flange to unseat from the valve seat when depressed;

a throttle lever coupled to the throttle valve;

a pivot pin secured to one end of the throttle lever coupled to the throttle valve; and

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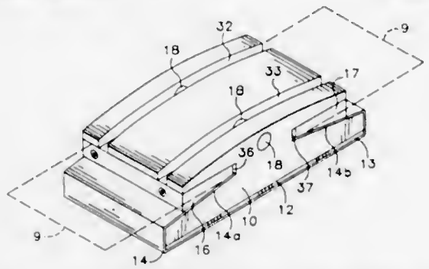
the first longitudinal axis of the main body forming an angle less than 60 degrees and more than zero degrees with respect to the second longitudinal axis of the handle.

5,588,904
FINISHING TOOL
Anthony Allport, 2402 NE. 14th, Portland, Oreg. 97212
Continuation-in-part of Ser. No. 278,450, Jul. 21, 1994, Pat. No. 5,474,490. This application Aug. 29, 1995, Ser. No. 521,116
Int. Cl.[6] B24D *17/00*
U.S. Cl. 451—512 **17 Claims**



14. A method for securing replaceable finishing material to a finishing tool, comprising the steps of:

providing a block having an associated first holding element and a first slot, said first holding element being coupled to a retraction element so that said retraction element imparts on said first holding element a pulling force directed toward said first slot;

applying a backward force on said first holding element so as to overcome said pulling force of said retraction element and so that said first holding element is disposed substantially outside said first slot;

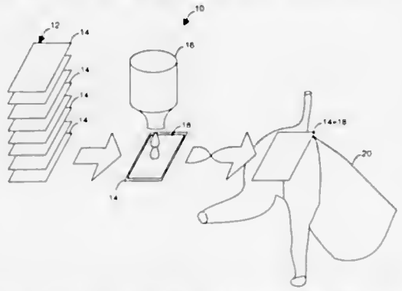
inserting a first length of finishing material in said first slot;

releasing said first holding element so that said retraction element pulls said first holding element into said first slot; and

aligning said first holding element in said first slot by operation of a guide element.

5,588,905
TOPICAL PATCH TO REDUCE FECAL CONTAMINATION DURING SLAUGHTER
William T. Nightingale, Alta Loma, Calif., assignor to Pacer Technology, Rancho Cucamonga, Calif.
Filed Dec. 5, 1995, Ser. No. 567,266
Int. Cl.[6] A22C *21/00*
U.S. Cl. 452—176 **9 Claims**

1. A patch for sealing the natural pelvic vents of animal car-

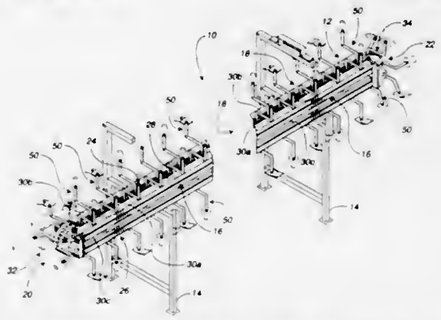


casses to prevent contamination of the carcasses with urine and fecal matter during later processing, comprising:

a rectangular strip of material having dimensions for application to the vents of corresponding male and female sexes of animal carcasses;

a tissue adhesive that cures in seconds and forms strong bonds to skin tissue applied to one side of the rectangular strip and providing for the sealing of the natural pelvic vents of the animal carcasses during slaughter processing wherein intestinal fecal matter and urine is prevented from leaking and contaminating said carcass.

5,588,906
OFFSET, POULTRY DEBONING SYSTEM
James F. Davis, 11976 Belks Ferry Rd., Canton, Ga. 30114
Continuation of Ser. No. 182,585, Jan. 18, 1994, Pat. No. 5,492,503. This application Feb. 8, 1996, Ser. No. 597,390
Int. Cl.[6] A22B *7/00*; **A22C** *17/04*
U.S. Cl. 452—179 **23 Claims**



1. An apparatus for facilitating the processing of poultry comprising:

an elongated frame;

a continuous conveyor movably supported by said frame for movement along an elongated path and including a first elongated edge and a second elongated edge;

a plurality of support arm members, wherein each said support arm member of said plurality of support arm members extends from said continuous conveyor; and

a plurality of support fittings wherein,

each said support fitting of said plurality of support fittings connects to one of said support arm members of said plurality of support arm members, and

said plurality of support fittings includes, at least,

a first plurality of support fittings proximate to said first elongated edge, and

a second plurality of support fittings proximate to said second elongated edge.

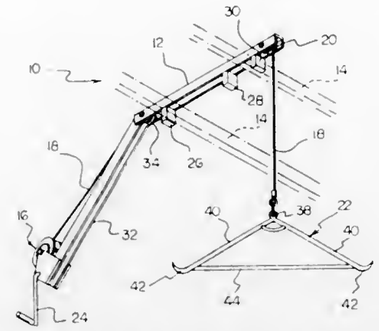
5,588,907
PORTABLE GAME HOIST
Richard P. DePietro, 301 Mountain Rd., Boyertown, Pa. 19512, and Brian J. Wilkinson, 27 Longview Rd., Birdsboro, Pa. 19508
Filed Dec. 22, 1995, Ser. No. 577,090
Int. Cl.[6] A22B *5/00; 5/16*
U.S. Cl. 452—187 **14 Claims**

1 A portable game hoist comprising:

a main beam which can be secured relative to a support structure;

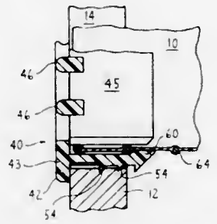
a winch secured relative to a first end of the main beam and storing a cable directed through the main beam to a second end of the main beam;

an outer pulley rotatably mounted at the second end of the main beam, the cable extending over the main beam and depending therefrom for coupling to an object; and



a plurality of abutment members being mounted to the main beam which operate to engage at least one rafter to preclude sliding of the main beam relative thereto with the main beam being placed across the at least one rafter of a support structure.

5,588,908
VENTILATION HOSE MOUNTING ASSEMBLY
Richard J. Camarota, Holland, Mich., assignor to ITC, Incorporated, Holland, Mich.
Filed Oct. 20, 1995, Ser. No. 546,376
Int. Cl.[6] F23J *11/02*; **B60H** *1/26*
U.S. Cl. 454—78 **13 Claims**



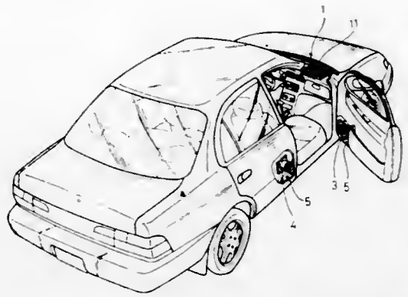
1. A hose-and-fitting assembly adapted to be secured to a port formed in a panel, said assembly comprising:

a fitting including: a face plate; a set of spaced apart lock tabs that extend inwardly from said face plate, said lock tabs being dimensioned to subtend the outer perimeter of the port and being spaced apart to define interstitial gaps; and a set of fingers that extend inwardly from said face plate, said fingers being located adjacent to and diametrically outwardly spaced from said lock tab interstitial gaps and being formed with fastening elements configured to be secured to portions of the panel forming the port; and

a hose fitted over outside surfaces of said lock tabs and in said lock tab interstitial gaps so that when said fitting is secured in the port, said hose is compression secured to said fitting by said fingers.

5,588,909
SOLAR POWER-OPERATED COOLING SYSTEM FOR MOTOR VEHICLES
Shing-Lai Ferng, No. 29, Her Lih Street., Taipeng, Taichung Hsien, Taiwan
Filed Jun. 1, 1995, Ser. No. 456,315
Int. Cl.[6] B60H *3/06*
U.S. Cl. 454—141 **3 Claims**

1. A solar power-operated cooling system for circulating air in a motor vehicle, the system comprising:



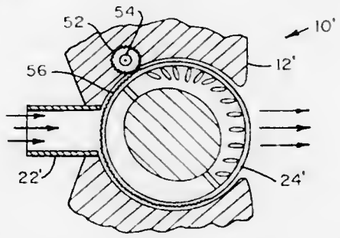
(a) a solar power device including a frame, a plurality of photovoltaic cells mounted within the frame for convening the radiant energy of sunlight into electric power, and a power output terminal for the output of electric power from the photovoltaic cells;

(b) an electric connector including an input terminal connected to the power output terminal of the solar power device, and first and second output terminals;

(c) a first blowing fan electrically connected to the first output terminal of the electric connector for installation in a first door assembly of a motor vehicle to draw outside fresh air into the interior of the motor vehicle through the first door assembly of the motor vehicle; and

(d) a first exhaust fan electrically connected to the second output terminal of the electric connector for installation in a second door assembly of the motor vehicle to draw inside hot air of the motor vehicle through drain holes in the second door assembly of the motor vehicle.

5,588,910
AIR OUTLET REGISTER FOR AN OPENING IN A VEHICLE
Robert J. Hutter, Plymouth; Christopher J. Martin, Northville, both of Mich., and Thomas W. Roesner, Pulheim, Germany, assignors to Ford Motor Company, Dearborn, Mich.
Continuation of Ser. No. 311,990, Sep. 26, 1994, abandoned. This application Dec. 21, 1995, Ser. No. 576,931
Int. Cl.[6] B60H *1/34*
U.S. Cl. 454—154 **12 Claims**



1. An air outlet for an opening in a vehicle, comprising:

an elongated body having first and second end portions, a hollow interior, a front outer peripheral surface having a front opening and extending between said first and second end portions, a rear outer peripheral surface having a rear opening and extending between said first and second end portions, a longitudinal axis and a transverse axis;

a first set of stationary vanes oriented parallel to said longitudinal and transverse axes and to one another and extending in said front opening between said first and second end portions and extending from said outer peripheral surface into said hollow interior of said body;

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a second set of stationary vanes with individual vanes oriented parallel to said longitudinal axis, nonparallel to said transverse axis and nonparallel to one another, said second set of stationary vanes extending in said front opening between said first and second end portions and extending from said outer peripheral surface into said hollow interior of said body; and

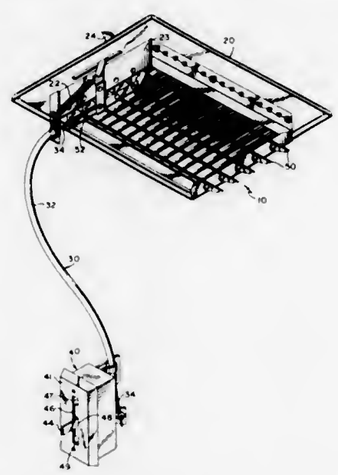
means for pivoting said elongated body between a first position at which said first set of stationary vanes is aligned with said rear opening along said transverse axis to receive a direct, linear flow of air exiting said rear opening to direct said flow of air across said first set of stationary vanes and through said from opening in a single direction, and a second position at which said second set of stationary vanes is aligned with said rear opening along said transverse axis to receive a direct, linear flow of air exiting said rear opening to direct said flow of air across said second set of stationary vanes and through said from opening in multiple directions.

5,588,911

MECHANICAL CONTROL FOR CENTRAL AIR CONDITIONERS' OUTLETS

Reynaldo Gomez, Miami, Fla., assignor to AC Directional Control, Inc., Miami, Fla.

Filed Oct. 11, 1995, Ser. No. 540,698
Int. Cl.[6] F24F *13/075*
U.S. Cl. 454—290 **4 Claims**



1. A mechanical control for the air flowing through air conditioner's outlet, comprising:

a) control means having a first lever that can be positioned in at least two positions;

b) shielded cable means including an internal cable and an outer shield having each first and second ends, said internal cable is slidably housed by said outer shield, and the first end of said internal cable being connected to said first lever so that said internal cable moves in response to the actuation of said first lever; and

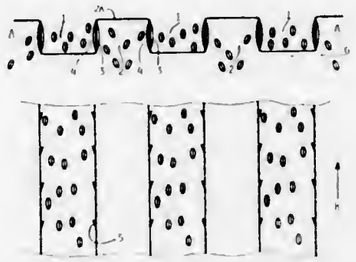
c) outlet means having a plurality of fins pivotally mounted to said outlet and linking arm means commonly connected to said plurality of fins, a second lever that actuates said fins, said second lever being pivotally mounted to said outlet and being connected to said second end of said internal cable so that the movement of said first lever is transmitted through said internal cable causes said second lever to move to a corresponding predetermined position.

5,588,912

SIEVE FOR HARVESTING MACHINES

Gustav Schumacher, II, Gartenstrasse 8, and Friedrich W. Schumacher, Goldwiese 22, both of 57612 Eichelhardt, Germany

Filed Jul. 7, 1995, Ser. No. 499,768
Claims priority, application Germany, Jul. 13, 1994, 44 24 383.9
Int. Cl.[6] A01F *12/32*
U.S. Cl. 460—101 **21 Claims**



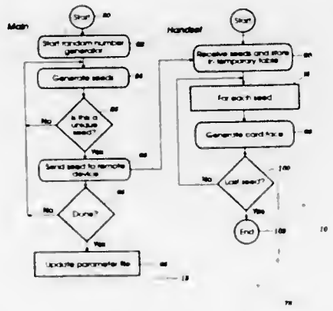
1. Sieve for separating grain crops from a chaff-straw mixture which is passed by a blower wind current from below and which comprises grooves (1) and channels (2) alternating with each other, said grooves and channels being elongated in a crop conveying direction and being aligned in parallel to the crop conveying direction, said grooves and channels being alternately open on the top and open on the bottom and having lateral legs (3) separating said grooves (1) from said channels (2), said lateral legs having openings (4) through which the harvested crop can pass from the grooves (1) open on top to the channels (2) open on the bottom.

5,588,913

GAMING SYSTEM AND PROCESS FOR GENERATING CARD FACES

Allen R. Hecht, 13360 Meadow Wood La., Granada Hills, Calif. 91344

Filed Jun. 14, 1994, Ser. No. 259,387
Int. Cl.[6] A63F *9/24*
U.S. Cl. 463—19 **37 Claims**



1. A process for generating a plurality of gaming card arrays, each formed of a plurality of symbols positioned in predetermined symbol display locations, in a remote device connected to a main station, the steps comprising:

developing a plurality of seeds to be utilized as input for generating gaming card arrays, said developing step including the steps of seeding a first pseudo-random number generator at the main station to create the plurality of seeds, verifying that each seed is not a duplicate of a previously created seed, and sending the plurality of seeds, less duplicates, to the remote device; and

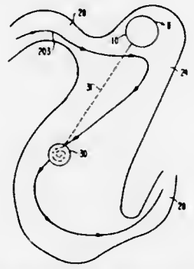
generating, at the remote device, gaming card arrays in accordance with input received from the main station utilizing a second pseudo-random number generator seeded by at least a portion of the plurality of seeds, wherein the second pseudo-random number generator always generates the same gaming card array as the first pseudo-random number generator for any given seed.

5,588,914

METHOD AND SYSTEM FOR GUIDING A USER IN A VIRTUAL REALITY PRESENTATION

John W. Adamczyk, Pasadena, Calif., assignor to The Walt Disney Company, Burbank, Calif.

Filed Jun. 28, 1994, Ser. No. 267,184
Int. Cl.[6] G06F *3/00*
U.S. Cl. 463—32 **26 Claims**



1. A method of guiding a user through a virtual reality experience in a virtual world having at least one virtual space, said user having a field of view, said method comprising:

projecting said virtual space in the field of view of said user;

defining at least one nominal path through said virtual space;

projecting an object in said virtual space in the field of view of said user;

moving said object along said at least one nominal path;

preventing said object from moving other than along said at least one nominal path;

allowing said user to move within said virtual space; and

restraining said user from exceeding a defined distance from said object.

5,588,915

SEAL AND SEAL GUARD ASSEMBLY FOR UNIVERSAL JOINT

Johnny N. Smith, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

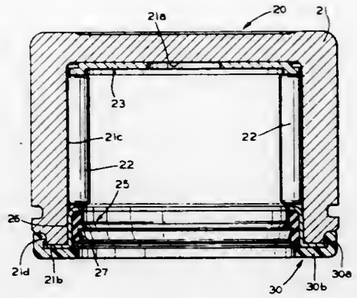
Filed Dec. 26, 1995, Ser. No. 578,273
Int. Cl.[6] F16C *33/76;* **F16D** *3/41;* **F16J** *15/32*
U.S. Cl. 464—14 **20 Claims**

1. A bearing cup assembly adapted for use with a cross member of a universal joint comprising:

a hollow bearing cup including an open end, a reduced diameter portion located adjacent to said open end, an inner bearing surface, and a closed end;

a seal assembly secured to said bearing cup and including a support ring and a seal secured to said support ring, said support ring including an axially extending portion and a radially extending flange portion; and

a seal guard secured to said seal assembly, said seal guard including a body portion and a protrusion extending from said body portion into said reduced diameter portion of said bearing cup, said radially extending flange portion of said support ring being trapped between said body portion and said protrusion of said seal guard to secure said seal guard to said seal assembly.

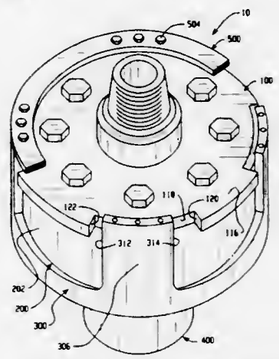


5,588,916

TORQUE CONTROL DEVICE FOR ROTARY MINE DRILLING MACHINE

Richard E. Moore, Humble, Tex., assignor to Duramax, Inc., Ohio

Filed Feb. 17, 1994, Ser. No. 197,726
Int. Cl.[6] E21B *17/06*
U.S. Cl. 464—20 **13 Claims**



1. A device for reducing the deleterious torque in a shock absorbing, rotary drive coupling unit for connecting a drive shaft and a driven shaft in a rotary mine drilling machine, said device comprising:

a drive plate connectable to the drive shaft of the rotary drilling machine;

a driven plate connectable to the driven shaft rotated by said drive shaft;

a shock and torque-absorbing portion fastened to said drive plate and fastened to said driven plate, said shock and torque-absorbing portion comprising elastomeric material for transmitting torque between sand drive plate and said driven plate;

torque-relief means operatively connected to said drive plate and said driven plate for limiting the torque placed on said shock and torque-absorbing portion, said torque-relief means including:

at least one first engagement member operatively connected to said drive plate, and

at least one second engagement member connected to said driven plate, wherein said first engagement member contacts said second engagement member and said drive plate, and relieves the torque on said shock and torque-absorbing portion and directly drives said driven plate in response to a predetermined amount of torque being applied to said

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driven plate, said predetermined amount of torque being selected to avoid torque-related damage to said elastomeric material from heavy loads;

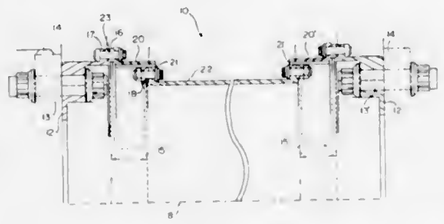
wherein said drive plate moves longitudinally away from said driven plate in response to the movement of the drive shaft relative to the driven shaft in a direction putting tension on said elastomeric material through said movement of said drive plate, and wherein said device further comprises a tensile force relief apparatus, said tensile force relief apparatus including a tensile force relief member attached to said driven plate and spaced from said drive plate in the path of movement of said drive plate when the drive shaft puts tension on said elastomeric material at a distance in which said drive plate engages said tensile force relief member to prevent damage to said elastomeric material when said drive plate moves in said direction.

5,588,917

COUPLING WITH DUAL TORQUE TRANSMISSION PATHS

Steve D'Ercole, Glenn Burnie, Md., assignor to KOP-Flex, Inc., Baltimore, Md.

Filed Nov. 14, 1994, Ser. No. 339,895
Int. Cl.[6] F16D *3/56;3/64;3/78*
U.S. Cl. 464—79 **6 Claims**



1. A coupling for accommodating misalignment between the axes of a drive shaft and a driven shaft, comprising:

a drive connector having an axis of rotation and being located at an end of the drive shaft,

an annular flexible coupler having a first member connected to said drive connector and a second axially spaced apart member connected to the driven shaft so as to transmit torque from the drive shaft to the driven shaft,

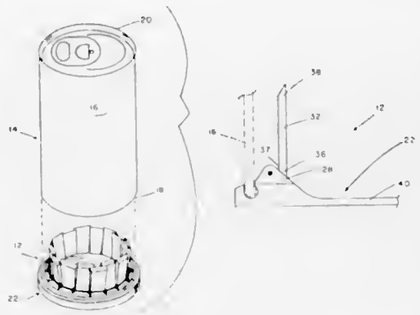
an annular secondary coupler having a first member connected to said drive connector and a second member located adjacent said second member of said annular flexible coupler for selectively engaging in torque transmitting relation with said second member of said annular flexible coupler when said annular flexible coupler is torsionally deflected beyond a threshold limit so as to continue torque transmission through said second member of said annular flexible coupler to the driven shaft, said drive connector comprising a ring having apertures spaced circumferentially about said ring for receiving bolts to connect the end of the drive shaft to said annular flexible coupler, said annular secondary coupler comprising a sleeve having an interior surface, said interior surface having gear teeth, said sleeve having at one end a radially extending flange provided with a plurality of apertures aligned with said apertures of said ring, said second member of said annular flexible coupler including a radially outer surface formed with gear teeth engageable with said gear teeth on said interior surface of said sleeve.

5,588,918

GOLF PUTTING CUP

Michael G. Eckman, and Paul A. Smallwood, both of Chesterfield, Mo., assignors to Taylor Nathan Co., Inc., St. Louis, Mo.

Filed Nov. 28, 1995, Ser. No. 563,343
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—187 **19 Claims**



1. A golf putting practice device comprising:

a base portion having at least one surface and a perimeter,

a plurality of substantially flat ramp structures, connected side-by-side around and substantially adjacent to the perimeter of the base portion, each ramp structure having a first end and a second end and extending continuously between the first end and the second end, the first ends of the ramp structures being disposed radially outward from a center of the base portion so as to define a central cup area, with the portion of the at least one surface of the base portion between the first ends of the plurality of ramp structures forming the floor of such central cup area, and

a plurality of pivotal connection structures mounted to the at least one surface, each of the ramp structures being loosely, pivotally connected at the first end thereof by a corresponding one of the plurality of pivotal connection structures to the at least one surface of the base portion, each one of the plurality of ramp structures, in normal putting practice position, extending outwardly from the pivotally connected first end thereof and downwardly until the second end of each of the ramp structures contacts a support surface for the device, to thereby facilitate rolling receipt of a golf ball into the central cup area of the base formed by the radially inwardly disposed first ends of the ramp structures.

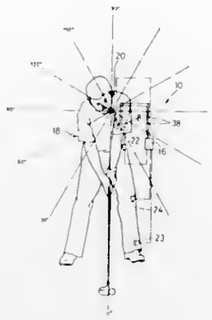
5,588,919

GOLF SWING TRAINING DEVICE

Yoshikazu Nakamura, 4-25, Kamigasa 1-Chome, Kusatsu-shi, Shiga 525, Japan

Filed Jul. 17, 1995, Ser. No. 503,242
Claims priority, application Japan, Aug. 2, 1994, 6-201418; Oct. 23, 1994, 6-284485
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—212 **17 Claims**

1. A golf swing training device comprising upper arm angle detecting means mounted on a golfer's upper arm for movement therewith as the golfer makes a swing, thereby detecting the angle of the upper arm, and informing means for informing the golfer of the upper arm angle detected by the upper arm angle detecting means.

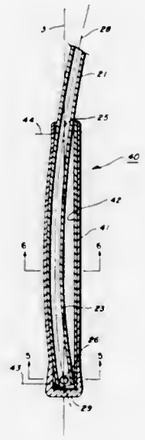


5,588,920

HANDLE OF GOLF CLUB WITH IMPROVED CONTROL

Tsai C. Soong, 1839 Jackson Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 503,311, Jul. 17, 1995, abandoned. This application Nov. 17, 1995, Ser. No. 560,113
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—231 **15 Claims**



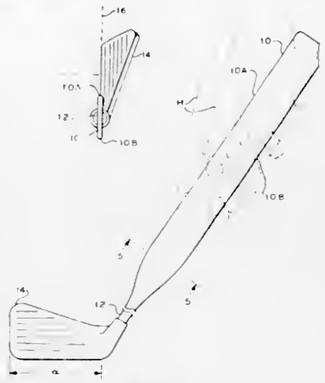
1. A golf club having a handle portion, a shaft middle portion and a golf head, the shaft middle portion connecting the handle portion to the golf head adapted for striking a golf ball, the handle portion having at least a rigid outer tube covering at least partially a base shaft, said base shaft having two ends, a head end joining the base shaft to the shaft middle portion and a butt end which is close to a butt of the golf club, the improvement wherein said outer tube being at least partially hollow, having at least an elongated, approximate rectangular, symmetric cutout at one side of its outer wall, parallel to the longitudinal axis of the outer tube, said symmetric cutout having a length and width and being positioned such that when the golf club hits the golf ball and the impact force causes the base shaft to bend inside the outer tube, the displaced, curved part of the base shaft can slide freely in and out of the outer tube as is required during impact, without interference from the outer tube.

5,588,921

GOLF CLUB

Keith Parsick, 585 Bloomfield Ave. Apt. 34, West Caldwell, N.J. 07006

Filed Sep. 27, 1995, Ser. No. 534,132
Int. Cl.[6] A63B *53/16*
U.S. Cl. 473—299 **15 Claims**



9. A golf club shaft, comprising:

a cylindrical shaft portion having a first end and a second end, said first end including means for attaching a golf club head to said cylindrical shaft portion; and

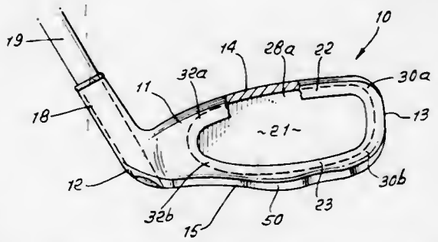
a flattened handle portion in the vicinity of said second end of said cylindrical shaft portion and integral with said cylindrical shaft portion, said flattened handle portion being flattened in a plane extending in a direction parallel to a direction faced by a golfer addressing a golf ball to be hit by said golf club, said flattened handle portion having a thickness in a direction parallel to said plane at least three times a thickness of said flattened handle portion in a direction perpendicular to said plane.

5,588,922

IRON GOLF CLUB HEAD WITH FORWARDLY DIVERGENT INTERIOR RECESS

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation of Ser. No. 235,930, May 2, 1994, which is a continuation of Ser. No. 52,697, Apr. 30, 1993, Pat. No. 5,330,187, which is a continuation of Ser. No. 921,857, Aug. 5, 1992, Pat. No. 5,282,625. This application Dec. 12, 1994, Ser. No. 354,486
Int. Cl.[6] B29C *43/18*
U.S. Cl. 473—324 **23 Claims**



1. A golf club head having a heel, toe, upper flange, lower flange, and a front wall defining an upwardly and rearwardly inclined from face comprising

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a) the head defining a forwardly extending main recess located rearwardly of said front wall, and between said upper and lower flanges,

b) said upper flange having a lower surface exposed to said recess,

c) said lower flange having an upper surface exposed to said recess,

d) said lower and upper surfaces relatively diverging, forwardly, from generally their rearwardmost extents and toward reduced thickness portions of said flanges proximate said front wall.

5,588,923

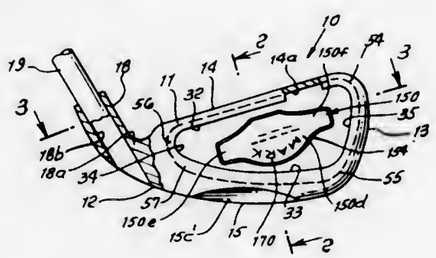
GOLF CLUB HEAD WITH ATTACHED SELECTED SWING WEIGHT COMPOSITE

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation-in-part of Ser. No. 119,622, Sep. 13, 1993, Pat. No. 5,409,229, which is a continuation-in-part of Ser. No. 999,250, Jan. 19, 1993, Pat. No. 5,301,946, which is a continuation-in-part of Ser. No. 921,857, Aug. 5, 1992, Pat. No. 5,282,625. This application Apr. 6, 1995, Ser. No. 414,552

Int. Cl.[6] A63B *53/04*

U.S. Cl. 473—340 **33 Claims**



1. In combination:

a) a golf club head having a front wall, said front wall having a rear side,

b) and a composite adhered to said rear side, said composite including:

i) a selected swing weight adjusting intermediary layer, and

ii) a non-metallic rearwardly facing layer providing identification graphics which are rearwardly visible.

5,588,924

GOLF BALL

Michael J. Sullivan, Chicopee; John L. Nealon, Springfield, and R. Dennis Nesbitt, Westfield, all of Mass., assignors to Lisco, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 171,956, Dec. 22, 1993, Pat. No. 5,503,397, which is a continuation of Ser. No. 800,198, Nov. 27, 1991, Pat. No. 5,273,287. This application Aug. 8, 1995, Ser. No. 512,356

Int. Cl.[6] A63B *37/12;37/14*

U.S. Cl. 473—377 **10 Claims**

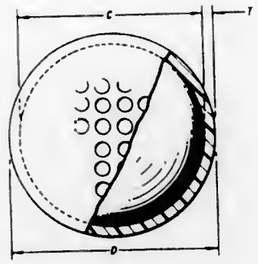
1. A golf ball of improved playing characteristics comprising

a ball having a core and a cover and a mean outside diameter of at least 1.70 inches;

said ball weighing no more than substantially 1.62 ounces;

a dimple pattern comprising a plurality of dimples on the surface of said ball, said dimple pattern covering at least 70.0% of the surface of said ball;

said golf ball having a P.G.A. compression of 70 or less.



5,588,925

SHIFTER FOR TRANSMISSIONS ON BICYCLES

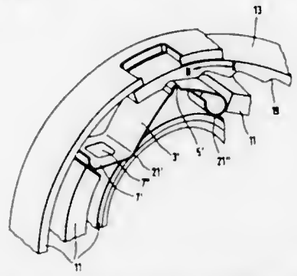
Markus Arbeiter, Würzburg, and Christian Weishaupt, Schwebheim, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Nov. 29, 1995, Ser. No. 563,996

Claims priority, application Germany, Dec. 2, 1994, 44 42 952.5

Int. Cl.[6] F16H *59/00*

U.S. Cl. 474—81 **8 Claims**



1. Shifter for a derailleur for bicycles, comprising a housing, a detent element which is connected both to a manual actuator and to the derailleur, as well as a detent spring made of elastic plastic material, a lug of which interacts with detents of the detent element and can have a transition distance between the housing and the detent spring, wherein the detent spring is located in a recess of the housing, whereby also located in the recess, in addition to the detent spring, located downstream in the direction of movement, is a transition spring which can apply a bias between the housing and the detent spring and can be compressed into a block.

5,588,926

SELF-GUIDED CHAIN ASSEMBLIES

Philip J. Mott; David C. White, both of Dryden, and Thomas J. Becker, Auburn, all of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Apr. 20, 1995, Ser. No. 425,575

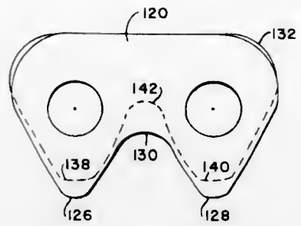
Int. Cl.[6] F16G *13/04*

U.S. Cl. 474—212 **17 Claims**

1. A silent chain assembly, comprising:

a plurality of interleaved inner and outer links, said links being adapted to contact the teeth of a sprocket, pivot members connecting adjacent links, each link having a pair of apertures for receiving said pivot members,

said outer links having a pair of depending toes extending downward below the apertures and defining a crotch therebetween said crotch having a height of a vertical distance extending between the lowest point on the toe to the highest point on the crotch, said toes having flanks that contact the teeth of a sprocket,



said inner links having a pair of depending toes extending downward below the apertures and defining a crotch therebetween said crotch having a height of a vertical distance extending between the lowest point on the toe to the highest point on the crotch, said toes having flanks that contact the teeth of a sprocket, and

said inner links each having a crotch of a first height, said outer links having a crotch of a second height, said second height being different from said first height.

5,588,927

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

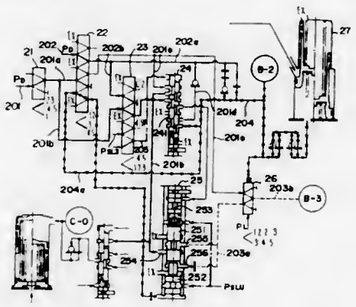
Kazumasa Tsukamoto, Toyota; Masahiko Ando, Okazaki; Masahiro Hayabuchi, Anjo; Akira Fukatsu, Anjo; Toshiyuki Mae, Anjo; Masato Kaigawa; Kagenori Fukumura, both of Toyota; Hidehiro Oba, Aichi-gun; Yasuo Hojo, Nagoya; Hiromichi Kimura; Atsushi Tabata, both of Okazaki; Tetsuo Hamajima, and Nobuaki Takahashi, both of Toyota, all of Japan, assignors to Aisin AW Co., Ltd., and Toyota Jidosha Kabushiki Kaisha, both of Japan

Filed Jun. 1, 1995, Ser. No. 455,677

Claims priority, application Japan, Jun. 2, 1994, 6-142203; Dec. 2, 1994, 6-329494

Int. Cl.[6] F16H *61/00*

U.S. Cl. 475—128 **14 Claims**



1. A control system for an automatic transmission comprising:

a first frictional engagement element and a second frictional engagement element;

a first hydraulic servo for controlling the application/release of said first frictional engagement element and a second hydraulic servo for controlling the application/release of said second frictional engagement element;

an oil passage connected to said first hydraulic servo at a single point for feeding/releasing an oil pressure to/from said first hydraulic servo;

a regulator valve disposed in said oil passage for regulating the oil pressure in said oil passage, said regulator valve having a valve member providing a plurality of pressure receiving areas; and

signal pressure generating means for applying a signal pressure to said regulator valve during a shift to a predetermined gear stage by engaging of one of said first and second frictional engagement elements and simultaneously releasing the other of said first and second frictional engagement elements, said signal pressure generating means changing said signal pressure during said shift in accordance with a predetermined pattern, said regulator valve regulating the oil pressure in said oil passage during said shift in accordance with said changing signal pressure,

wherein said pressure receiving areas of said valve member include:

a first pressure receiving area which receives the oil pressure to said first hydraulic servo as a feedback pressure and is thereby urged in a first direction;

a second pressure receiving area which receives said signal pressure and is thereby urged in a second direction opposite to said first direction;

a fourth pressure receiving area which receives the oil pressure to said second hydraulic servo and is thereby urged in said first direction during said shift; and

a third pressure receiving area which receives said signal pressure only during said shift and is thereby urged in said second direction and thereby participates in the regulation of the oil pressure in said first oil passage during said shift.

5,588,928

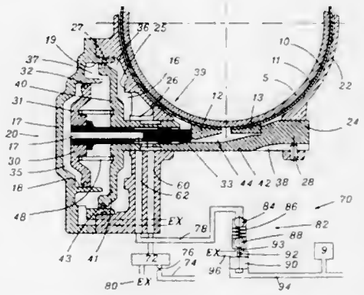
SELF-SYNCHRONIZING BRAKE BAND ACTUATING SYSTEM FOR AUTOMATIC CHANGE SPEED TRANSMISSIONS

Erkki A. Koivunen, 18260 Blue Heron Pointe Dr., Northville, Mich. 48167

Filed May 8, 1995, Ser. No. 436,756

Int. Cl.[6] F16H *63/30*

U.S. Cl. 475—126 **13 Claims**



1. A self-synchronizing brake band and a band control unit for the use in an automatic change gear ratio transmission having input and output means cooperating with a planetary gear unit with selectively engagable friction members to provide a plurality of transmission gear ratios, including a hydraulically operated clutch operable to condition the transmission for one gear ratio and a friction drum operatively connected to such said gear unit, said drum adapted to be frictionally engaged to condition the transmission for another gear ratio, a transmission case having a cavity formed therein, the improvement comprising

a friction band with apply and reaction ends disposed at least partially around said drum for the selective frictional engagement with said drum, said band having a first abutment member at said apply end and having a second abutment member at said reaction end,

a first piston operatively mounted for stroking movement in said cavity for effecting the frictional engagement of said band with said drum for establishing said another gear ratio,

an elongated force transmitting member operatively disposed between said first piston and said first abutment member.

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a second piston operatively mounted in said cavity, an extension disposed between said second piston and said second abutment member and operative therebetween as a force transmitting member,

a source of fluid pressure,

fluid pressure chamber means for said first and second pistons,

fluid conducting passages having an inlet port and a flow restricting means and an exhaust port, said inlet port leading between said chamber means and said source of fluid pressure,

a fluid control system controlling the fluid pressure in said fluid pressure chamber means,

said control system having a movable control valve element open to said inlet port for feeding pressure fluid through said flow restricting means into said fluid pressure chamber means,

said control valve element being movable by varying brake band reaction force transmitted through said second abutment member to control and vary the degree of opening of said exhaust port and said chamber means to exhaust and thereby regulate the pressure of said fluid therein so that there is an increase in pressure in said chamber means when the transmitted torque of said band increases and a decrease in said pressure when the transmitted torque of said band decreases.

5,588,929

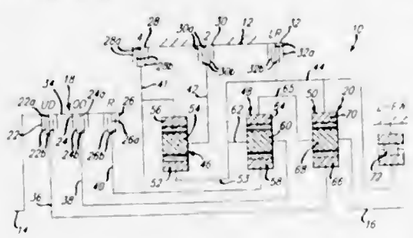
FOUR-SPEED AUTOMATIC TRANSMISSION

Howard L. Benford, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Nov. 28, 1994, Ser. No. 345,669

Int. Cl.[6] F16H *3/62*

U.S. Cl. 475—276 **17 Claims**



1. A four-speed automatic transmission for a vehicle comprising

a transmission housing;

an input member;

an output member;

three planetary gearsets for changing a ratio of torque between said input member and said output member;

a plurality of clutch assemblies to selectively couple said input member to predetermined gears of said planetary gearsets and a plurality of brake assemblies to selectively couple predetermined gears of said planetary gearsets to said transmission housing;

first means for allowing said output member and a planetary carrier from one of said planetary gearsets and an annulus gear of another of said planetary gearsets to rotate simultaneously;

said planetary gearsets comprising a first planetary gearset, a second planetary gearset axially spaced from said first planetary gearset and a third planetary gearset axially spaced from said second planetary gearset, said first planetary gearset being disposed between said input member and said second planetary gearset and said third planetary gearset being disposed between said second planetary gearset and said output member;

each of said first, second and third planetary gearsets comprising a sun gear, an annulus gear and a planetary carrier having a plurality of circumferentially spaced pinion gears disposed between said sun gear and said annulus gear; and

second means for allowing said sun gear of said first planetary gearset and said planetary carrier of said second planetary gearset and said annulus gear of said third planetary gearset to rotate or remain stationary simultaneously.

5,588,930

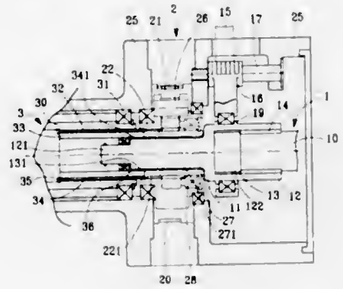
TWO-SPEED GEARBOX

Li-Yu Chen, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 21, 1995, Ser. No. 407,566

Int. Cl.[6] F16H *3/44*

U.S. Cl. 475—300 **1 Claim**



1. A two-speed gearbox for use with a motor comprising:

(a) a housing;

(b) an input part, comprising:

(i) an input shaft which is connected from one end of the motor, said input shaft is provided with external splines;

(ii) a spline shaft which slides axially and rotates in the same direction as said input shaft and is located at a front end of said input shaft, wherein said spline shaft has a thick first end with a hollow portion provided with internal splines to mesh with said external splines of said input shaft; said spline shaft is also provided with external splines;

(c) a gear shift mechanism, comprising a gear shift lever, a gear shift bearing, and a slider, wherein said gear shaft lever is inserted from outside into said housing to drive said slider to slide on a fixed rod and, by use of said gear shift bearing, to connect a lower portion of said slider to a lock-in place on an outside surface of said spline shaft so as to drive said spline shaft to slide axially;

(d) a speed reduction part comprising an annular gear, a planetary gear, a planetary gear frame and a sun gear, wherein said planetary gear frame is fixed to said housing by a pair of first bearings, said planetary gear is positioned to said planetary gear frame through a set of planetary gear shafts, said sun gear is positioned at said planetary gear frame by a second bearing, said planetary gear frame has an inner surface which is provided with internal splines and said sun gear also has an inner surface which is also provided with internal splines; said planetary, gears and said sun gears are connected via a gear reducing means so as to cause a speed ratio to be effectuated;

(e) an output part comprising an output shaft which is positioned at said housing by a pair of third bearings, said output shaft is provided with internal splines which are meshed with a matching set of external splines of a shaft coupler so as to cause both said output shaft and said shaft coupler to rotate synchronously after meshing and transmit power from said shaft coupler to said output shaft; said shaft coupler is also provided with internal splines;

(f) first and second position limiters provided on said spline shaft and said shaft coupler, respectively, wherein said first and second position limiters are positioned such that, during a normal operation condition, said spline shaft is stopped by said first position limiters so that a portion of said external splines of said spline shaft are engaged with said internal splines of said shaft coupler to transfer power thereto at a first gear ratio; with an increased force by which said gear shift lever pulls said spline shaft away from said shaft coupler, said first position limiter provided on the spline shaft will stop at said gear shaft beatings such that said external splines of said spline shaft are engaged with nothing, thus causing said gearbox to be at a neutral position; finally, when said gear shift lever pulls the spline shaft further away from said shaft coupler, said first and second position limiters and said gear shift bearing cooperatively cause said external splines of said shaft coupler to be engaged with said internal splines of said planetary gears frame, and said external splines of said spline shaft are to be engaged with said internal splines of said sun gears, so as to transfer power from said spline shaft to said shaft coupler at a second gear ratio.

5,588,931

PLANETARY REDUCER AND WHEEL BEARING UNIT

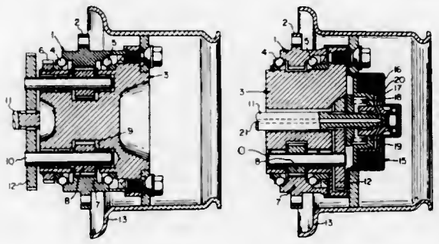
Franz Forster, Karlstadt-Mühlbach, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Jul. 6, 1994, Ser. No. 271,144

Claims priority, application Germany, Jul. 14, 1993, 43 23 539.5

Int. Cl.[6] B60K *17/04;* **F16H** *57/08*

U.S. Cl. 475—338 **25 Claims**



1. An integral speed reduction and wheel mounting unit adapted to support a wheel on a motor vehicle, said unit comprising an axle pivot member having an outer surface, axially spaced annular bearings mounted on said outer surface of said axle pivot member, an annular axle housing having an inner surface mounted on said axially spaced bearings, whereby said axle pivot member is a driven member, a ring gear formed on said inner surface of said axle housing located between said axially spaced bearings, at least one intermediate shaft rotatably mounted in said axle pivot member, at least one radial recess formed in said axle pivot member and a planet gear fixed on said at least one intermediate shaft located partially within said radial recess and meshing with said ring gear, one end of said at least one intermediate shaft extending out of said axle pivot member and means for operatively connecting said one end of said at least one intermediate shaft to a drive shaft coaxial with the axis of rotation of said axle pivot member, whereby rotation of said at least one intermediate shaft rotates said axle pivot member relative to said annular axle housing.

5,588,932

DEVICE FOR THE SETTING OF THE MUTUAL POSITIONS OF PIVOTABLE ELEMENTS

Lennart Lindblad, Vårgårda, Sweden, assignor to Linvent AB, Vargarda, Sweden

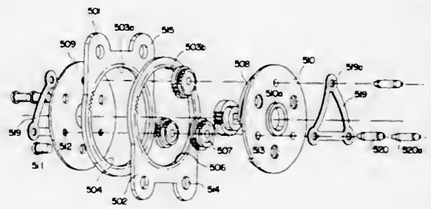
PCT No. PCT/SE93/00470, § 371 Date Dec. 27, 1994, § 102(e) Date Dec. 27, 1994, PCT Pub. No. WO94/00314, PCT Pub. Date Jan. 6, 1994

PCT Filed May 27, 1993, Ser. No. 362,593

Claims priority, application Sweden, Jun. 29, 1992, 9201988

Int. Cl.[6] F16H *57/08*

U.S. Cl. 475—341 **9 Claims**



1. A device for pivotably setting a relative position of a first and a second pivotable element, comprising:

first and second driving components each having a plate-like configuration of a like thickness, and including coaxially aligned circular openings therein, each of said openings respectively defining a toothed periphery which forms a ring gear, each of said driving components circularly rotatable with respect to one another about a common and stationary axis, one of said ring gears having a larger diameter than the other;

a sun gear spaced interiorly coaxially of said ring gears and circularly rotatable about said common axis;

means for rotating said sun gear, said means disposed along said common axis and having said sun gear fixedly attached thereto;

at least one planetary wheel gear, each of said planetary gears simultaneously enmeshed with said sun gear and each of said ring gears, each of said planetary wheel gears rotating about a respective axis, each of which is parallel to said common axis, each of said planetary wheel gear axis rotating circularly about said common axis as each said planetary wheel gear is rotatably driven, thereby rotating said ring gears and said first and second driven components coaxially with respect to one another;

spacing means disposed between said driving components for maintaining a separation distance therebetween, said spacing means interposed between each of said planetary wheel gears;

a pair of circular end discs coupled to each other, one said disc associated with said first driving component and the other said disc associated with said second component, said end disc arranged to enclose a respective said opening on said driving component, whereby said sun gear and said planetary wheel gears are retained interiorly of said ring gears;

cylindrically configured bearing means for respectively supporting each of said planetary wheel gears along an axial direction, each of said bearing means of a like diameter and axially centered about its associated and respective planetary wheel gear axis, each of said bearing means extending between said end discs and received within a respective opening provided in each of said discs, said openings of a diameter larger than said diameter of said bearing means in order to provide limited radial movement of each bearing means from its respective planetary wheel gear axis; and

means for simultaneously biasing each of said planetary gears radially outward into continuous enmeshed contact with each of said ring gears when said rotating means is acted upon, said biasing means continually eliminating any free slack between said planetary and ring gears.

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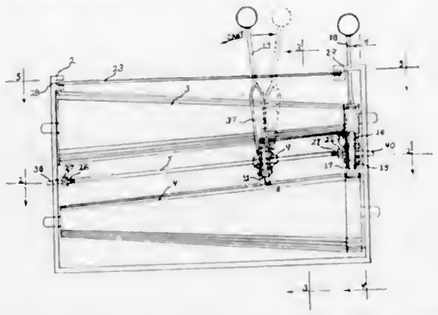
5,588,933

INFINITE RATIOS CANT WHEEL TRANSMISSION

Delbert L. Hartman, Rte. #1 P.O. Box 292, Mcgaheysville, Va. 22840

Filed Aug. 23, 1993, Ser. No. 110,738
Int. Cl.[6] F16H *15/18*
U.S. Cl. 476—51 **4 Claims**



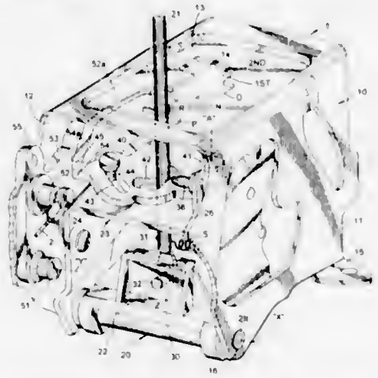
1. An infinitely variable ratio transmission including a housing a pair of laterally spaced and registered tapered input and output shafts journaled from said housing about substantially parrallel axis and including adjacent peripheral portions disposed in substantially parallel axis and including adjacent peripheral portions disposed in substantially parrallel planes, a pair of cantable intermediary power transmitting wheel journaled on said rack including surface areas disposed in optional resistance frictional engagement with the outer surface of said shafts and means operative to shift said cantable intermediary wheels along said rack also including two more intermediary wheels journaled within said bracket and means operative to reverse rotation of said output shaft.

5,588,934

SHIFTER WITH MEANS FOR ACTUATING CABLE TO KEY MECHANISM

Charles Osborn, Spring Lake; Robert M. Medema, Muskegon, and Andrew K. Ruiter, Spring Lake, all of Mich., assignors to Grand Haven Stamped Products, Grand Haven, Mich.

Filed Apr. 11, 1995, Ser. No. 419,804
Int. Cl.[6] F16H *61/18;63/36*
U.S. Cl. 477—96 **21 Claims**



1. A transmission shifter for a vehicle including a shifter lever assembly having a handle, means for guiding said handle in movements along a serpentine path in shifting from "Park" position to other shifter positions, said serpentine path including movements in fore and aft directions and sidewise directions transverse to said fore and aft directions, a cable connector for operatively connecting said lever assembly to a cable extending from a key mechanism of said vehicle to said shifter, the improvement comprising:

a first cam member;

a second cam member operatively connected to said cable connector; and

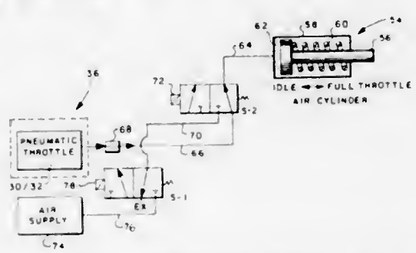
an operative connection between said lever assembly and said second cam member; said first cam member being mounted on said lever assembly and engaging said second cam member for moving said second cam member for actuating said cable connector to actuate said cable.

5,588,935

THROTTLE CONTROL FOR AUTOMATED MECHANICAL TRANSMISSION

Mark A. Osinski, Kalamazoo, and Donald D. Teadt, Vicksburg, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 29, 1995, Ser. No. 537,316
Int. Cl.[6] B60K *41/03*
U.S. Cl. 477—107 **25 Claims**



1. In combination, a throttle control assembly (**36**) and system controller (**48**) for controlling shifting in an automated mechanical transmission system (**10**) having a non-electronically controlled engine (**14**):

said throttle control assembly comprising a fuel controller (**54**) responsive to a control signal at an inlet (**64/62**) thereto to provide fueling of the engine in a minimum (idle) to a maximum amount, a first signal device (**30**) for providing a first signal (**68**) proportional to an operator setting of a manually controlled throttle device (**32**), a second signal device (**74**) for providing a second signal (**76**) effective when connected to said inlet to cause said fuel controller to fuel said engine to said maximum amount, said fuel controller biased to the position for fueling said engine in said minimum amount and effective to cause said engine to be fueled in said minimum amount in the absence of a signal at said inlet, a first control device (**S1**) having a first and second position and a second control device (**S2**) having a first and second position, said control devices cooperatively effective (i) when said first and second devices are both in the first positions thereof to connect said first signal to said inlet, (ii) when said first control device is in the first position thereof and said second control device is in the second position thereof, to cause an absence of a signal at said inlet, (iii) when said first control device is in the second position thereof and said second control device is in the first position thereof, to cause said first signal to be connected to said inlet, and (iv) when both said first and second control devices are in the second positions thereof, to cause said second signal to be connected to said inlet; and

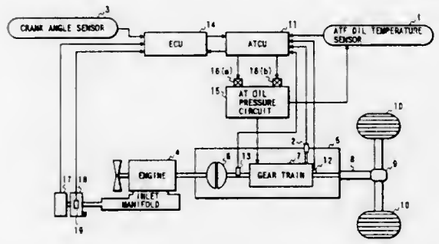
said control having a memory for storing logic rules for (i) causing said first and second control devices to assume said first positions thereof when fueling of the engine is to be controlled by the operator, (ii) causing said first control device to assume said first position thereof and said second control device to assume said second position thereof when decreased fueling of said engine is required, and (iii) causing said first and second control devices to assume said second positions thereof when increased fueling of said engine is required.

5,588,936

CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION AND CONTROL METHOD THEREFORE

Makoto Uchida; Masahiko Ibamoto, both of Hitachinaka; Kazuhiko Sato, Hitachioota; Hiroshi Kuroiwa, Hitachi; Hiroshi Ohnishi, Hitachinaka, and Toshimichi Minowa, Toukai-mura, all of Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Engineering Co., Ltd., both of Japan

Filed Apr. 27, 1995, Ser. No. 429,909
Claims priority, application Japan, Apr. 27, 1994, 6-089367; Jul. 20, 1994, 6-167704
Int. Cl.[6] F02D *35/00;* **F16H** *61/00*
U.S. Cl. 477—155 **22 Claims**



1. A control apparatus for an automatic transmission mounted on a vehicle having a vehicle power train composed of an engine and an automatic transmission having a torque converter, and detecting means for detecting an engine rotational speed and an engine load of said vehicle power train and a vehicle speed of the vehicle, said control apparatus controlling said vehicle power train using signals detected by said detecting means, which control apparatus comprises:

characteristic memory means for storing an output power characteristic of the engine; and

means for obtaining a driving shaft torque in a first gear ratio before a gear shift of the automatic transmission, based on at least said engine rotational speed and said engine load detected by said detecting means and said output power characteristic stored in said characteristic memory means, estimating driving shaft torque in a second gear ratio after a gear shift of the automatic transmission, based on said engine load and said vehicle speed, and outputting a gear shifting signal to said automatic transmission at a time when said driving shaft torque before said gear shift falls below the value of said driving shaft torque after said gear is shifted, plus a certain predetermined value.

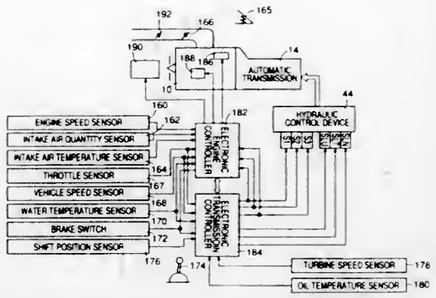
5,588,937

SLIP CONTROL APPARATUS FOR MOTOR VEHICLE LOCK-UP CLUTCH

Katsumi Kono, Toyota; Shinya Nakamura, Owariasahi, and Atsushi Honda, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 19, 1995, Ser. No. 504,078
Claims priority, application Japan, Jul. 22, 1994, 6-171469
Int. Cl.[6] F16H *61/14*
U.S. Cl. 477—169 **8 Claims**

1. An apparatus for controlling an amount of slip of a lock-up clutch connecting an input and an output rotary member of a fluid-filled power transmitting device of a motor vehicle, according to a slip control output such that an actual slip speed of the lock-up



clutch coincides with a target slip speed, said slip control output being determined according to a slip control equation including at least an integral action term, and on the basis of a feedback control value for zeroing a control error between said actual and target slip speeds, and a learning control value which is updated depending upon a running condition of the vehicle, said apparatus comprising:

slip control means for providing said slip control output; and

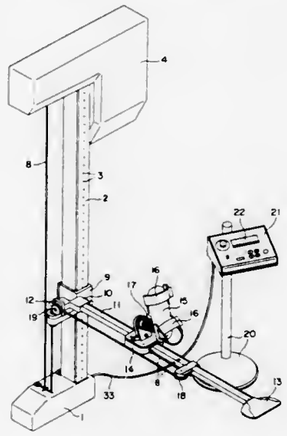
output change restricting means for adjusting said feedback control value such that an amount of change of said slip control output provided by said slip control means is smaller than an amount of change of said learning control value.

5,588,938

STRENGTH OF A MUSCLE TRAINING APPARATUS

Werner Schneider, Ermatingen; Hansueli Lerch, Steckborn, and Erich Hausammann, Ermatingen, all of Switzerland, assignors to Fritz Gegauf AG Bernina Nahmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 18, 1994, Ser. No. 344,645
Claims priority, application Switzerland, Nov. 30, 1993, 03 569/93
Int. Cl.[6] A63B *21/00*
U.S. Cl. 482—4 **19 Claims**



1. A strength or muscle training apparatus comprising engaging elements for arm and foot training, program-controllable driving means for moving and loading said engaging elements, extension arms carrying said engaging elements, a supporting structure having a plurality of coupling means at different levels for attachment of each of said extension arms at a selectable fixed level of said supporting structure, the apparatus thus being adaptable for a wide variety of training conditions.

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5,588,939

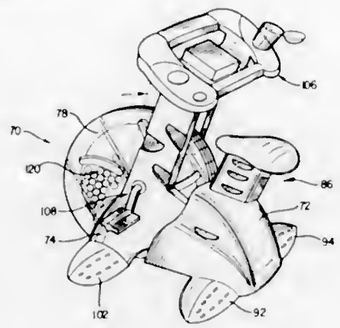
EXERCISE BIKE WITH AMUSEMENT FEATURES

Yu Zheng, 1065 Howard Ave., Covina, Calif. 91722

Filed Jan. 11, 1996, Ser. No. 584,171

Int. Cl.[6] A63B *69/16*

U.S. Cl. 482—57 **6 Claims**



1. An exercise apparatus, comprising:

a base comprising a seat assembly provided thereon;

a flywheel comprising a plurality of ornaments provided therein;

a housing assembly connected to the base for rotatably supporting the flywheel; and

a pedal assembly rotatably coupled to the housing assembly and the flywheel;

wherein rotation of the pedal assembly causes the flywheel to rotate, thereby causing the plurality of ornaments inside the flywheel to bounce around.

5,588,940

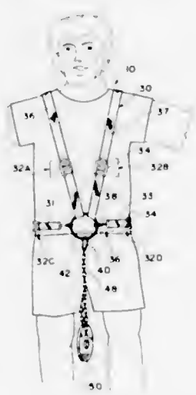
WEIGHT SUPPORTING BODY HARNESS

Eric M. Price, and Aaron R. Price, both of 63 Cambridge Dr., Short Hills, N.J. 07078

Filed Jun. 12, 1995, Ser. No. 489,392

Int. Cl.[6] A63B *21/065*

U.S. Cl. 482—105 **4 Claims**



1. A weight supporting body harness adapted to be positioned on the body of a user to facilitate the attachment of additional weight to the user, said weight supporting body harness comprising:

a continuous, nonelastic torso engaging webbing assembly including left and right suspending portions with left and right front ends adapted to be positioned about the torso of a user with said suspending portions engageable with a user's shoulders;

a waist encircling webbing assembly including left and right side waist straps each having a forward end and a rear portion adapted to be positioned about the waist of a user;

means to adjust a length of said torso engaging webbing assembly;

means to adjust a length of said waist encircling webbing assembly;

a front hoop supported by said left and right front ends of said continuous torso engaging webbing assembly, said front hoop adapted to be positioned at a first portion of a user's waist;

means to connect said forward ends of said left and right side waist straps to said front hoop;

a rear hook connected no said continuous torso engaging webbing assembly generally at a midlength thereof, said rear hook adapted to be positioned at a rear portion of a user's waist;

means to connect said rear portions of said left and right side waist straps to said rear hook; and

a flexible weight suspending means having a front end releasably secured to said front hoop and a back end releasably secured to said rear hook said weight suspending means for use to support weight between the legs of a user of said weight supporting body harness.

5,588,941

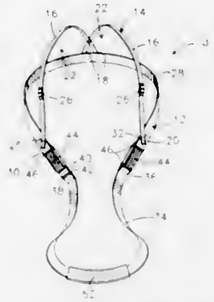
SPINE THERAPHY AND EXERCISE DEVICE

Gary L. Scott, 331 Indian Hills Circle, Clinton, Anderson County, Tenn. 37716

Filed May 22, 1995, Ser. No. 445,691

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—131 **19 Claims**



1. A spine therapy and exercise device for stretching and strengthening muscles associated with one of at least a person's back, abdomen, and legs, said spine therapy and exercise device comprising:

a belt member defining a loop configuration, said belt member including a torso engagement portion and a leg engagement portion each being fabricated from a durable and flexible material, said torso and leg engagement portions each defining a proximal end and a distal end, said torso engagement portion being dimensioned to circumvent at least a person's back and sides, said leg engagement portion being secured to said torso engagement portion in an end-to-end fashion and being dimensioned to receive a portion of at least one of the person's legs;

a harness carried by said belt member, said harness torso engagement portion of said belt member proximate an upper portion of the user's back; and

an adjustment member for varying a length of said loop configuration defined by said belt member, said adjustment member being secured to said proximal end of said torso engagement portion, said distal end of said leg engagement portion being slidably received by said adjustment member, said length of said loop configuration being adjusted by pulling said leg engagement portion through said adjustment member.

5,588,942

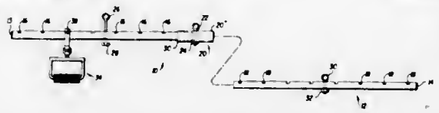
ADJUSTABLE EXERCISE DEVICE

Keith A. Dillard, 9108 Helena Rd., Pelham, Ala. 35124

Filed Apr. 21, 1995, Ser. No. 426,915

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—139 **14 Claims**



1. An adjustable exercise device comprising an elongated rigid bar having a longitudinal axis, a pair of spaced hand grips, each hand grip including a hand grip portion adapted to be manually gripped and a mounting portion for mounting the hand grip portion on said bar, said mounting portion being freely pivotally supported by said bar for pivotal movement about a pivot axis extending substantially perpendicular to said longitudinal axis, a swivel connection between said hand grip portion and said mounting portion so that the hand grip portion can swivel relative to said mounting portion through an angle of 360 degrees about an axis of rotation, said axis of rotation being disposed substantially perpendicular to and passing through said pivot axis at the point where said mounting portion is pivotally supported by said bar, said locking means for selectively locking said swivel connection to prevent the hand grip portion form swiveling relative to said mounting portion.

5,588,943

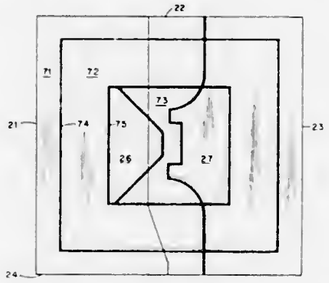
CARTON BOTTOM SEALING DIES

Vincent Mills, and Tim P. Hughes, both of Cedar Rapids, Iowa, assignors to International Paper Company, Purchase, N.Y.

Division of Ser. No. 215,173, Mar. 21, 1994, Pat. No. 5,482,204. This application Oct. 10, 1995, Ser. No. 541,943

Int. Cl.[6] B31B *1/88*

U.S. Cl. 493—58 **5 Claims**



1. A paperboard container bottom sealing tool comprising a cooperative pair of embossing dies, said pair including a convex surface die and a concave surface die, said concave surface die including at least three substantially parallel planar areas of concentrically diminishing areal magnitude aligned in a stepped sequence, two innermost planar areas being delineated by respective riser ridges about an outer perimeter thereof, said convex surface die including a plurality of substantially parallel planar areas of concentrically diminishing areal magnitude aligned in a stepped sequence and in meshing correspondence with planar areas respective to said concave die, said convex die having at least two interior planar areas delineated by respective riser ridges, the interior planar area that is innermost of said convex die being transversely divided into at least two portions by an air venting channel therebetween.

5,588,944

APPARATUS FOR WELDING THE TUBULAR SECTIONS OF SACKS, BAGS OR THE LIKE

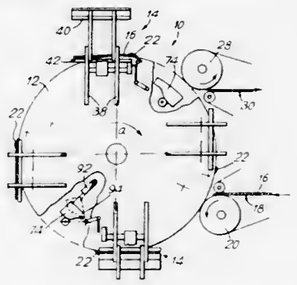
Fritz Achelpohl, Lienen, and Hermann Sandmeier, Bielefeld, both of Germany, assignors to Windmöller & Hölscher, Lengerich/Westf., Germany

Filed Aug. 1, 1994, Ser. No. 282,481

Claims priority, application Germany, Aug. 2, 1993, 43 25 877.8

Int. Cl.[6] B31B *19/60;21/60*

U.S. Cl. 493—205 **6 Claims**



1. An apparatus for welding tubular sections of sacks, bags or the like, comprising:

a rotating drum,

welding stations arranged on the periphery of the drum so as to rotate with, while fixed relative to, the drum, wherein the welding stations are arranged laterally each on one of end sides of the drum;

on the drum, grippers that can be caused to open and close and are assigned to the individual welding stations for seizing, holding and release of the tubular sections; and

a movable welding jaw of the welding station, forming a flat bearing surface for the zone of the tubular section to be welded, while the drum itself has a cylindrical peripheral surface,

said welding station including upper and lower ones of said welding jaws, of which the lower welding jaw can be pivotally connected by means of resiliently deformable plates extending substantially parallel to each other, to a stand fixed to the drum and being pivotable by means of a piston-and-cylinder arrangement that is articulated on a knee lever.

5,588,945

METHOD AND DEVICE FOR SPACING A CORRUGATING FINGER RELATIVE TO A CORRUGATING ROLL

David M. Lauderbaugh, Roswell, Ga., assignor to Corrugated Gear & Services, Inc., Alpharetta, Ga.

Filed Feb. 21, 1995, Ser. No. 395,379

Int. Cl.[6] B31B *1/00;* **B31F** *1/20*

U.S. Cl. 493—480 **23 Claims**

1. A device for spacing a corrugating guide finger, having an outer surface and an inner surface, a leading end and a trailing end, relative to a corrugating roll defining an outer surface, the corrugating guide finger and the corrugating roll being arranged so as to receive a corrugating medium therebetween, the device comprising:

a head, configured for engagement with the corrugating guide finger wherein the head further comprises a hole for receipt of the trailing end of the corrugating guide finger; and

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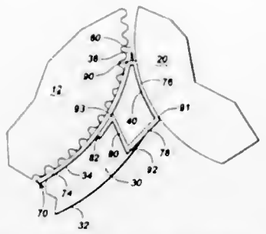


a tail connected to the head and configured for placement between the inner surface of the corrugating guide finger and the outer surface of the corrugating roll.

5,588,946

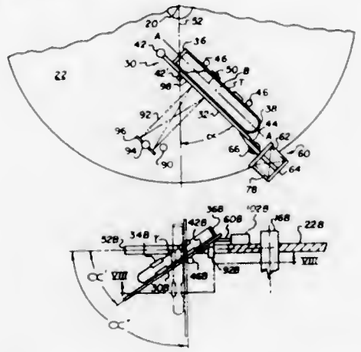
CENTRIFUGE AND PHASE SEPARATION

Gary A. Graham, Rochester; Merrit N. Jacobs, Fairport, both of N.Y.; Russel H. Marvin, Riverton, Wyo.; James D. Shaw, Hilton, and Nicholas VanBrunt, Rochester, both of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 265,536, Jun. 24, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 466,640

Int. Cl.[6] B04B *5/02;13/00*

U.S. Cl. 494—11 **10 Claims**



7. A centrifuge for spinning tubes containing a gel separator and patient sample, comprising

a rotor,

a motor operatively connected to said rotor to rotate it about a rotor axis to generate centrifugal forces in directions radiating from said axis,

a sample tube holder pivotally mounted adjacent to one end on a pivot on said rotor and constructed to hold a patient sample test tube having a long axis,

a latch disposed at a location adjacent the end of said holder opposite to said one end in position to removably engage said holder, said holder being freely pivotable about said pivot except when engaged by said latch, said latch location and said pivot forming a first position for said test tube axis that is misaligned with a radius of said rotor by a non-zero angle to provide the Boycott effect to a sample test tube in said tube holder when said rotor is rotating, said latch location being farther from said rotor axis than said pivot,

and moving means on said rotor for unlatching and opening said latch in response to a predetermined centrifugal force generated by spinning said rotor, said moving means including a weight slidably mounted on said rotor and connected to said latch to move to unlatch said latch in response to a predetermined centrifugal force in excess of force generated by rotating for said Boycott effect.

5,588,947

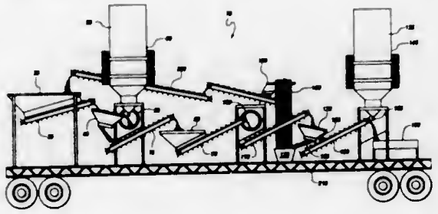
APPARATUS AND METHOD FOR TREATING HAZARDOUS WASTE MATERIAL

Michael K. Studer, Flower Mound; Thomas J. Zodrow, Grapevine, both of Tex., and Timothy J. Elms, Plant City, Fla., assignors to Entact Corporation, Irving, Tex.

Filed Nov. 29, 1994, Ser. No. 346,634

Int. Cl.[6] A62D *3/00;* **B09B** *3/00*

U.S. Cl. 588—252 **19 Claims**



1. A device for transforming hazardous waste into a stable nonhazardous substance comprising:

a preliminary conditioning unit;

a screening unit coupled to the preliminary conditioning unit via a first conveyor; and

a recycling unit coupled to the screening unit via a second conveyor.

12. A method of transforming hazardous waste into a stable nonhazardous substance comprising the steps of:

a) separating the hazardous waste into oversized materials and smaller materials in a first screening member;

b) crushing the oversized materials;

c) adding a bonding additive to the oversized materials;

d) combining the crushed oversized materials with the smaller materials;

e) separating oversized materials from smaller materials in a second screening member;

f) adding a binding additive to the smaller materials to create a mixture; and

g) grinding the mixture into the stable, nonhazardous substance.

5,588,948

STEREOSCOPIC ENDOSCOPE

Susumu Takahashi, Iruma; Masao Uehara, Hachioji; Shingo Kato, Chofu; Atsushi Kidawara, Tachikawa; Katsuyuki Saito, Hachioji; Masahito Goto, Saitama-ken; Wataru Ohno, Hachioji; Iwao Kanamori, Yokohama; Toyoharu Hanzawa, Fuchu; Kenji Yoshino, Hachioji; Akio Nakada, Hachioji; Akihiro Taguchi, Hachioji; Nobuaki Akui, Hino; Hitoshi Karasawa, Hachioji; Toshihiko Hashiguchi, Sagamihara; Akihiko Mochida, Hachioji; Takashi Fukaya, Hachioji; Shinji Yamashita, Hachioji; Akira Murata, Hino; Hideki Koyanagi, Hachioji, and Keisuke Saito, Fuchu, all of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 17, 1993, Ser. No. 122,303

Claims priority, application Japan, Feb. 17, 1993, 5-028278

Int. Cl.[6] A61B *1/04;* **H04N** *13/00*

U.S. Cl. 600—111 **14 Claims**

9. A stereoscopic endoscope having an inserting section comprising:

an image forming optical system arranged in an inserting section of the endoscope and provided with a single objective lens system at a distal end of the inserting section for forming an object image, and an image transmission means including a relay lens system for reforming said object image, said objective lens system and said relay lens system having a common optical axis;

pupil dividing shutter means for selectively making different areas of a pupil of said image forming optical system transmittable by receiving light transmitted through said relay lens system;

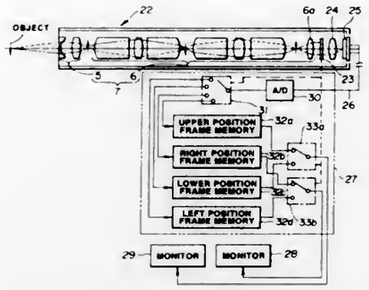
a single image sensing means for receiving images formed by light fluxes transmitted through said pupil dividing shutter means;

a first support means for supporting at least said objective lens system; and

a second support means for supporting at least said image sensing means,

said first and second support means each being independently rotatable relative to each other around an axis extending along the longitudinal dimension of the endoscope,

wherein said endoscope is separated into said inserting section supported by said first support means containing said objective lens system and said image transmission means and an operating/holding section supported by said second support means containing said pupil dividing shutter means and said image sensing means for picking up object images obtained by said pupil dividing means, said inserting section and said operating/holding section being rotatable relative to each other around the optical axis of the optical system.



5,588,949

STEREOSCOPIC PERCUTANEOUS VISUALIZATION SYSTEM

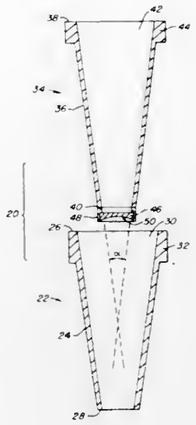
Charles S. Taylor, San Francisco; Brian S. Donlon, Palo Alto, and Timothy R. Machold, Moss Beach, all of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 135,387, Oct. 8, 1993, abandoned. This application Apr. 13, 1994, Ser. No. 227,366

Int. Cl.[6] A61B *1/00;1/313*

U.S. Cl. 600—166 **74 Claims**

1. An improved surgical microscope of the type having a microscope body, lens device attached to the microscope body for magnifying an object image, and an eyepiece attached to the microscope body for viewing the magnified object image, the improvement comprising a supplementary lens and a coupling device attached to the microscope body for retaining the supplementary lens in optical alignment with the lens device, wherein the coupling device comprises a cannula having a passage in which the supplementary lens may be removably positioned, the cannula having a distal end configured for introduction into the body cavity through a percutaneous penetration.



5,588,950

PORTABLE ENDOSCOPE SYSTEM

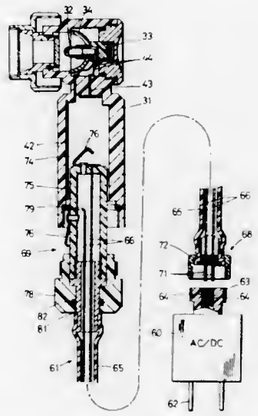
Hiroshi Sano; Hirohisa Ueda; Rensuke Adachi; Kunitoshi Ikeda; Kunikiyo Kaneko, and Takashi Koeda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1995, Ser. No. 499,128

Claims priority, application Japan, Jul. 11, 1994, 6-157748; Apr. 20, 1995, 7-094093; Apr. 20, 1995, 7-094622

Int. Cl.[6] A61B *1/06*

U.S. Cl. 600—178 **9 Claims**



1. A portable endoscope system having an illuminating light guide for transmitting light for illuminating an object, said illuminating light guide having an entrance end portion disposed in an endoscope control part, and an illuminating light supply unit for supplying illuminating light to said illuminating light guide, said illuminating light supply unit being detachably attached to said control part, said portable endoscope system comprising:

an AC/DC conversion adapter which is connected to an AC power supply to output a predetermined DC voltage, said AC/DC conversion adapter being connectable to said illuminating light supply unit;

wherein said illuminating light supply unit comprises a light source lamp for emitting illuminating light which is supplied to said illuminating light guide, and a battery for supplying lighting energy to said light source lamp, said AC/DC conver-

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sion adapter being connected to said illuminating light supply unit through a space defined in said illuminating light supply unit by removal of said battery; and

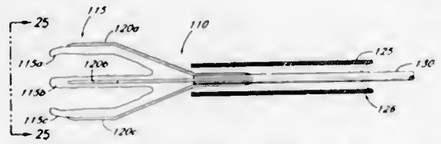
wherein the AC power supply supplies lighting energy to said light source lamp through said AC/DC conversion adapter.

5,588,951

INFLATABLE ENDOSCOPIC RETRACTOR WITH MULTIPLE RIB-REINFORCED PROJECTIONS

Yong H. Zhu, Loma Linda, and Wolff M. Kirsch, Redlands, both of Calif., assignors to Loma Linda University Medical Center, Loma Linda, Calif.

Division of Ser. No. 6,250, Jan. 19, 1993, Pat. No. 5,400,773.
This application Jan. 27, 1995, Ser. No. 379,258
Int. Cl.[6] A61B *17/32;10/00*
U.S. Cl. 600—207 **5 Claims**



1. An inflatable retractor adapted for use in endoscopic surgery on a patient's body, comprising:

an outer, elongate rigid cannula for insertion into said patient's body;

a non-collapsible tube having a distal end and a proximal end, said tube being capable of being inserted into said cannula such that a portion of said proximal end of said inner tube remains outside the patient's body;

a balloon having a plurality of inflatable projections joined at a single opening mounted on the distal end of said tube and supported and positioned by said tube;

support ribs, wherein each of said projections has an attached support rib, said support rib being capable of being manipulated into a first bent position which is at an angle to the axis of said inflatable projection prior to insertion into said cannula, but adapted to straighten upon insertion into said cannula and then spring back into said first bent position upon exiting said cannula.

5,588,952

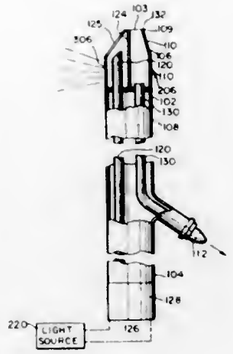
INTRACARDIAC ILLUMINATOR WITH SUCTION

Bhaktavathsala R. Dandolu, 585 General Patterson Dr., Philadelphia, Pa. 19038

Filed Aug. 2, 1993, Ser. No. 101,452
Int. Cl.[6] A61B *1/06*, **A61M** *1/00*
U.S. Cl. 600—249 **16 Claims**

1. A flexible illumination and suction device comprising a flexible fiber optic cable having a distal end terminated directly below a transparent cover that forms part of a first section of a rigid, two section housing having a length that is a minor portion of the cable, and a proximal end connected to a light source disposed outside the device; a single flexible aspiration conduit having a distal end connected to and in fluid communication with an opening providing fluid communication with a second section of the rigid housing to create a single aspiration channel and a proximal end terminated by a suction connector; and a flexible tubular body surrounding the fiber optic cable and the aspiration conduit therein and sealed to the housing and the connector in a fluid tight manner, wherein the fiber optic cable comprises a bundle of fibers cut at an angle of less than 90 degrees relative to its longitudinal dimension and thereby directly emits light in a radial direction from the fibers of the bundle, and wherein the second section of the housing terminates in an aspiration tip disposed distally forward of the first section,

whereby fluid is rapidly aspirated to permit an area of tissue to be observed.

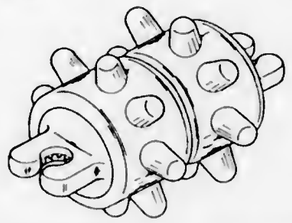


5,588,953

ROLLER ASSEMBLY FOR MASSAGING DEVICE

Chien-Chung Chang, No.82,Ho Tso Street, Sun Chung Li, Feng Yuan City, Taiwan

Filed Dec. 28, 1995, Ser. No. 580,310
Int. Cl.[6] A61H *15/00;39/04*
U.S. Cl. 601—124 **2 Claims**



1. A roller assembly for a massaging device, said roller assembly comprises:

a shaft having one end of a hollow construction and further having another end provided with two lugs and a ratchet located between said two lugs for holding securely a resilient cord, said one end of a hollow construction provided in an inner wall thereof with a plurality of retaining ribs arranged at an interval;

a plurality of roller sleeves fitted rotatably over said shaft and provided respectively on an outer wall surface thereof with a plurality of massaging protuberances; and

a locating plug having one end secured to said one end of said shaft, said one end of said locating plug provided in an outer wall surface thereof with a plurality of retaining slots engageable with said retaining ribs of said shaft when said locating plug is secured to said one end of said shaft, said locating plug further having another end provided with two lugs and a ratchet located between said two lugs for holding securely a resilient cord.

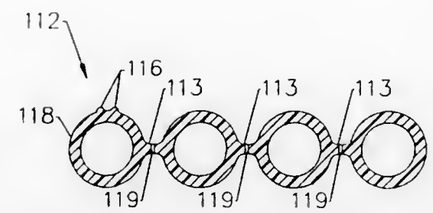
5,588,954

CONNECTOR FOR A GRADIENT SEQUENTIAL COMPRESSION SYSTEM

Philip P. Rihando; Kenneth M. Bolam; Donald H. Peeler, all of Charlotte, N.C., and Terry L. Sandman, Toledo, Ohio, assignors to Beiersdorf-Jobst, Inc., Charlotte, N.C.

Filed Apr. 5, 1994, Ser. No. 222,829
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—149 **3 Claims**

1. A connector for providing a continuous fluid passageway between a source of pressurized fluid and an elongated pressure



sleeve, said sleeve defining a plurality of inflatable chambers, each of said chambers having a means for attachment to the source of pressurized fluid at a connector interface having a plurality of outlet ports, said connector comprising:

a flexible conduit comprising

a plurality of elongate tubes, each of said tubes having a first end and a second end; and

at least one elongate connecting partition integrally formed between an adjacent pair of said tubes;

a plurality of fittings, each of said fittings attached to said first end of one of said tubes and forming a fluid-tight seal therewith, each of said fittings having means for forming a fluid-tight seal with one of said outlet ports to communicate the pressurized fluid; and

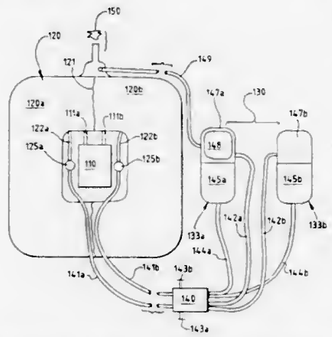
a grip portion comprising at least one finger for engaging a hole provided in said at least one connecting partition to enhance the transfer of stresses from said conduit to said grip portion attached adjacent said first ends of said tubes and gripping said at least one connecting partition to transfer stresses induced in said conduit to said grip portion without substantially compressing said tubes, said grip portion releasably retaining said fittings in fluid-tight relationship with said outlet ports.

5,588,955

METHOD AND APPARATUS FOR PROVIDING THERAPEUTIC COMPRESSION FOR REDUCING RISK OF DVT

Glenn W. Johnson, Jr., Summit; Henry J. McVicker, and David C. Hargrave, both of Chatham, all of N.J., assignors to Aircast, Inc., Summit, N.J.

Continuation of Ser. No. 88,895, Jul. 8, 1993, abandoned. This application Apr. 12, 1995, Ser. No. 421,040
Int. Cl.[6] A61H *9/00*
U.S. Cl. 601—152 **15 Claims**



2. An apparatus for applying therapeutic intermittent pressure to a human leg, said apparatus comprising

a pump means,

a fluid reservoir for receiving a substantially steady flow of pressurized fluid from said pump means,

inflatable cuff means for applying pressure to the leg, said cuff means being in fluid communication with said reservoir, and said cuff means being configured to apply said therapeutic pressure substantially to the medial and lateral aspects of the leg,

means for facilitating the intermittent transmission of compressed fluid from said reservoir to said inflatable cuff means, said facilitating means comprising a valve means operatively disposed between said reservoir and said cuff means and a timer operatively coupled to said valve means, whereby said timer may be set to operate said valve means at predetermined intervals and for pre-determined periods of time to control the intermittent transmission of compressed fluid from said reservoir to said cuff means, said valve means also permitting exhaustion of fluid from said cuff means,

pressure relief means operatively coupled to said inflatable cuff means for controlling the pressure therein, and

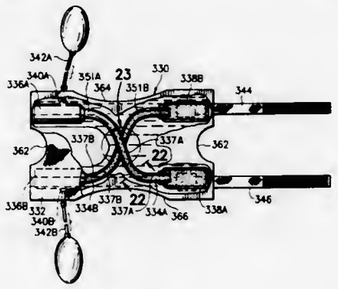
further including an air cell adapted to be operatively disposed between said cuff means and the leg, and a bellows in sealed fluid communication with said air cell, said air cell and bellows adapted to provide an indication of the intermittent application of therapeutic pressure to said body portion.

5,588,956

METHOD FOR SUPPORTING BODY JOINTS AND BRACE THEREFOR

Joseph D. Billotti, 18 Powder Hill, Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 366,316, Dec. 29, 1994, Pat. No. 5,527,267, which is a division of Ser. No. 137,830, Oct. 15, 1993, Pat. No. 5,378,224, which is a continuation-in-part of Ser. No. 73,722, Jun. 9, 1993, abandoned. This application May 17, 1995, Ser. No. 442,782
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—13 **10 Claims**



1. A brace for supporting a weakened joint of the body, the weakened joint being a knee joint wherein both the anterior cruciate ligament and the posterior cruciate ligament are absent or have been repaired, so as to permit translation of the knee joint while restraining movement of the knee joint in directions which would tend to strain the cruciate ligaments to thereby support the weakened knee joint against movement of the knee joint in said directions and concomitant further injury to the knee joint, the brace comprising:

a flexible sheet adapted to be applied to the knee joint so as to protect the weakened knee joint from abrasion while permitting translation of the knee joint;

two inflatable chambers contained within the flexible sheet, each of said chambers including a medial section having a generally sinuous shape for juxtaposition with the weakened knee joint along a corresponding generally helical path of each of the cruciate ligaments around the knee joint to establish two corresponding generally helical paths around the knee joint as determined by the sinuous shapes of the inflatable chambers when the brace is applied to the weakened knee joint, one of said two helical paths corresponding to the path of the anterior

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cruciate ligament and the other of said two helical paths corresponding to the path of the posterior cruciate ligament;

said inflatable chambers being flexible when deflated, for conforming to said two generally helical paths around the knee joint, and being relatively stiff when inflated for contacting and supporting the weakened knee joint along said two generally helical paths around the knee joint such that anterior and posterior translations of the knee joint are permitted and motion of the knee joint in said directions which would place a strain on the cruciate ligaments is restrained;

means for holding the brace firmly in place when applied to the knee joint, with the inflatable chambers following the two generally helical paths around the weakened knee joint; and

means for selectively inflating the inflatable chambers subsequent to applying the brace to the knee joint such that upon application of the brace to the knee joint and subsequent inflation of the inflatable chambers the weakened knee joint is supported with anterior and posterior translation of the knee permitted by virtue of the flexibility of the flexible sheet, while movement in said directions which would tend to strain the anterior and posterior cruciate ligaments is restrained by virtue of the stiffness and shape of the inflated chambers.

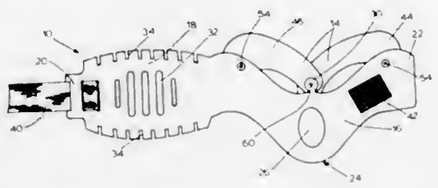
5,588,957
CERVICAL COLLAR

Bill Martin, Sr., Shepherdsville, Ky., assignor to Ambu International A/S, Glostrup, Denmark

Continuation of Ser. No. 237,139, May 3, 1994, abandoned, which is a continuation of Ser. No. 64,221, May 20, 1993, Pat. No. 5,336,438. This application Aug. 15, 1995, Ser. No. 515,219

Int. Cl.[6] A61F *5/04*

U.S. Cl. 602—18 **14 Claims**



1. A cervical collar comprising:

an elongated neck encircling band, said elongated neck encircling band having a collar retaining means;

a chin support brace secured to said elongated neck encircling band, said chin support brace having:

a first chin support element; and

a second chin support element; said first chin support element and said second chin support element each has a first end and a second end, said first end of each of said first chin support element and said second chin support element is rotatably affixed to first and second locations on said elongated neck encircling band, said second end of said first chin support element rotatably overlaps and is affixed to said second end of said second chin support element; and

a locking means secured to said chin support brace whereby rotation of said first chin support element and said second chin support element into an operable and locked position bows said chin support brace.

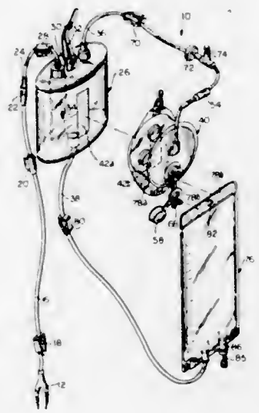
5,588,958
CLOSED WOUND ORTHOPAEDIC DRAINAGE AND AUTOTRANSFUSION SYSTEM

Robert W. Cunningham, Cohasset, Mass.; Durmus Koch, Demarest, N.J.; Janine R. Mura, Colchester, Conn.; Augustus Felix, Providence, and Gary V. Halick, East Greenwich, both of R.I., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 21, 1994, Ser. No. 310,268

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—4 **24 Claims**



1. A closed wound orthopaedic drainage system for the collection of a patient's autologous shed blood following orthopaedic surgery comprising:

a substantially rigid collection container having an interior, a liquid inlet and a liquid outlet;

a patient drainage tube coupled with the liquid inlet of the rigid collection container and being adapted to be open to receive autologous shed blood from a wound and transfer it to the rigid collection container;

a blood collection bag having a liquid inlet and liquid outlet for receiving the blood transferred from the rigid collection container for reinfusion back into the patient, the rigid container adapted to be elevated relative to the collection bag;

a transfer tube coupled with the liquid outlet of the rigid collection container and liquid inlet of the bag for transferring the blood from the rigid collection container to the bag;

a suction reservoir means separated from and in fluid communication with the interior of the rigid collection container for applying suction to the container interior to cooperate in draining the blood from the wound through the patient drainage tube into the collection container whereby

elongated tubing means extending between the separated collection container and the suction reservoir means for coupling the interior of the rigid collection container and the interior of the suction reservoir means;

coupling means for permitting the suction reservoir means to be coupled directly to the patient drainage tube,

when the patient drainage tube is open and the transfer tube is closed and suction is applied to the collection container by the suction reservoir, the blood is adapted to flow from the patient wound through the transfer tube into the collection container,

when blood is to be transferred from the collection container to the collection bag, the patient drainage tube is closed, the transfer tube is opened, suction is released from the system, the container is elevated relative to the bag to permit gravity flow of blood;

when the blood has been transferred to the collection bag, the transfer tube is closed, the patient drainage tube is opened and suction is reapplied by the suction reservoir means;

when the blood transferred to the collection bag is to be reinfused into the patient, an administration set is coupled with the outlet of the bag, and the bag is suspended from an IV pole and the administration set is coupled with the patient.

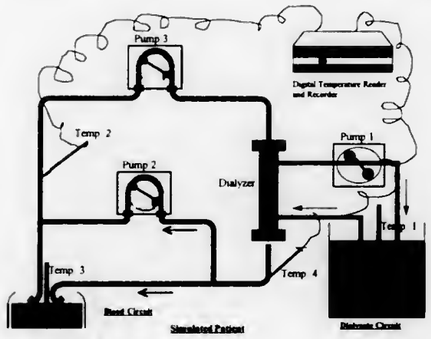
5,588,959
HEMODIALYSIS RECIRCULATION MEASURING METHOD

Suhail Ahmad, Seattle; James J. Cole, Arlington, and Mahboob Ahmed, Bothell, all of Wash., assignors to University of Washington, Seattle, Wash.

Filed Aug. 9, 1994, Ser. No. 288,678

Int. Cl.[6] A61M *37/00; 1/00*

U.S. Cl. 604—6 **5 Claims**



1. A method for determining the amount of recirculation in a patient undergoing a dialysis treatment, comprising measuring temperature of an arterial limb and a venous limb of a dialysis access, changing temperature of blood being returned to the patient without adding volume, and measuring temperature of the arterial limb and the venous limb of the dialysis access to determine if there is a temperature change in the arterial limb to determine the amount of recirculation.

5,588,960
TRANSURETHRAL NEEDLE DELIVERY DEVICE WITH CYSTOSCOPE AND METHOD FOR TREATMENT OF URINARY INCONTINENCE

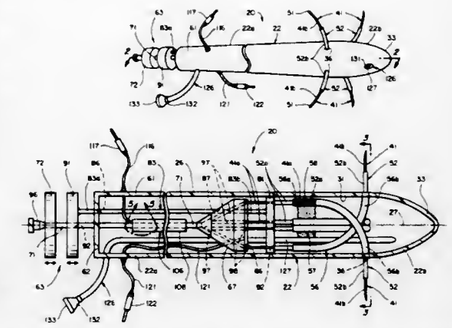
Stuart D. Edwards, Los Altos; Ronald G. Lax, Grass Valley, and Hugh R. Sharkey, Redwood City, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Filed Dec. 1, 1994, Ser. No. 349,064

Int. Cl.[6] A61B *17/39*

U.S. Cl. 604—20 **17 Claims**

1. A medical device for use in a female human body to deliver an agent to a target volume of tissue including a sphincter muscle which surrounds a urethra in the body to treat urinary incontinence, the urethra formed by a urethral wall extending from a bladder to the exterior of the body, comprising an elongate probe member having proximal and distal extremities and a longitudinal axis, the elongate probe member being sized to be able to enter the urethra and having a length so that when the distal extremity is disposed in the vicinity of the target volume of tissue the proximal extremity is outside of the urethra, the elongate probe member having a passage extending from the proximal extremity to the distal extremity, at least one tubular needle disposed in the passage and having first



and second extremities and a flow passageway therein extending longitudinally from the first extremity to at least one opening provided in the second extremity, a control handle secured to the proximal extremity of the elongate probe member, operative means carried by the control handle and connected to the first extremity of the at least one tubular needle for causing movement of the at least one tubular needle in the passage and means carried by the elongate probe member for directing the at least one tubular needle through a curved path extending at an angle to the longitudinal axis as the at least one tubular needle moves in the passage, the tubular needle and the operative means included within means for introducing the agent into the target volume so as to add mechanical support to the sphincter muscle and thus increase the closure forces exerted by the sphincter muscle upon the urethra.

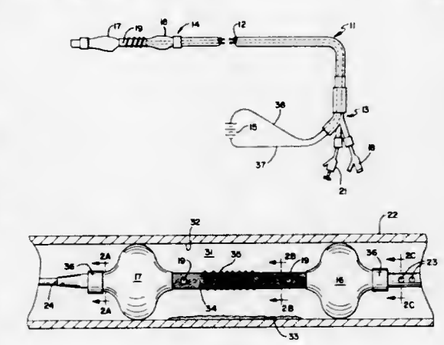
5,588,961
ELECTRO-OSMOTIC INFUSION CATHETER

James E. Leone, and Stephen M. Rowland, both of Miami, Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Division of Ser. No. 259,534, Jun. 14, 1994, Pat. No. 5,505,700. This application Jan. 5, 1996, Ser. No. 582,328

Int. Cl.[6] A61M *31/00*

U.S. Cl. 604—21 **2 Claims**



1. A method for infusion of a treatment fluid to a location within a living body, the method comprising the steps of:

providing an infusion catheter having a treatment length along which are located at least one balloon member and at least two electrodes positioned on opposite sides of the balloon member, one of the electrodes having a charge the same as that of a treatment fluid, this electrode being closely positioned with respect to a location at which the treatment fluid infuses from a distal portion of the catheter assembly;

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inserting the infusion catheter into a vessel or cavity of a living body;

inflating the balloon member so as to engage the body vessel or cavity;

applying an EMF source to the electrodes whereby said one electrode has one charge and the other electrode has the opposite charge;

infusing medicament into the distal portion of the catheter assembly at a location generally along the internal catheter, the medicament having a charge the same as that of said one electrode to thereby move the medicament away from said one electrode and to the body vessel or cavity to be treated in accordance with the method; and

migrating the medicament of the infusing step to the body vessel or cavity at a rate faster than that achievable by osmotic pressure alone.

5,588,962

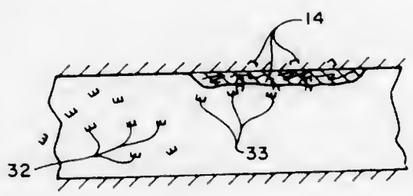
DRUG TREATMENT OF DISEASED SITES DEEP WITHIN THE BODY

Peter M. Nicholas, South Dartmouth; Ronald A. Sahatjian, Lexington, and James J. Barry, Marlborough, all of Mass., assignors to Boston Scientific Corporation, Natick, Mass.

Filed Mar. 29, 1994, Ser. No. 219,108

Int. Cl.[6] A61N *1/30*

U.S. Cl. 604—52 **27 Claims**



1. A method for treating a diseased site in a vascular lumen deep within the body of a patient, comprising:

(a) providing a drug-localizing agent for a drug that is effective to treat said diseased site,

(b) providing a medical device capable of being placed into said vascular lumen at said diseased site and capable of delivering said localizing agent locally at said site,

(c) preparing said medical device for delivering said agent at said site,

(d) placing said medical device at said site,

(e) locally delivering said agent to said site in a manner that said agent is retained at said site,

(f) removing said medical device from said vascular lumen,

(g) providing said drug effective to treat said diseased site in a form suitable for systemic administration, and

(h) systematically administering said drug so that said drug is transported through the body of said patient and localized at said diseased site by the presence of said drug-localizing agent retained at said site.

5,588,963

METHOD FOR LIQUID FLOW MEASURING AND APPARATUS TO PRACTICE THIS METHOD

Bernardus J. G. M. Roelofs, Dammestraat 1, NL 5628 NM Eindhoven, Netherlands

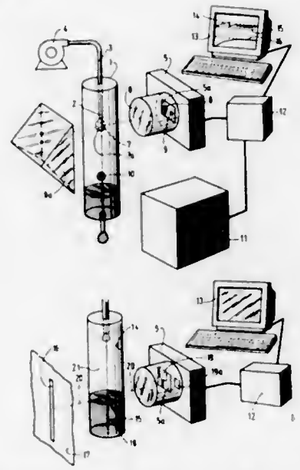
PCT No. PCT/NL92/00193, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO93/09407, PCT Pub. Date May 13, 1993

PCT Filed Oct. 28, 1992, Ser. No. 240,665

Claims priority, application Netherlands, Oct. 30, 1991, 9101825

Int. Cl.[6] A61M *5/16*

U.S. Cl. 604—65 **16 Claims**



11. An apparatus for measuring either a flow rate of a liquid, comprising:

a) a fluid outlet through which the liquid flows and forms a droplet;

b) an imaging means for imaging said droplet at different instants in time;

c) projection means for projecting images of said droplet onto said imaging means; and

d) processing means coupled to said imaging means for determining the different volumes of said droplet at different instants in time from the images of said droplet projected onto said imaging means, for taking the difference between said different volumes to provide a volume growth of said droplet, and for determining said flow rate based on said volume growth of said droplet over a period of time defined by said different instants.

5,588,964

STEERABLE CATHETER WITH ADJUSTABLE BEND LOCATION AND/OR RADIUS AND METHOD

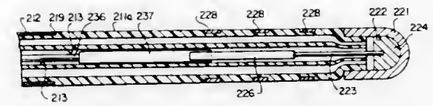
Mir A. Imran, Palo Alto; Mark L. Pomeranz, Los Gatos, and Brian A. Glynn, Sunnyvale, all of Calif., assignors to Cardiac Pathways Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 147,753, Nov. 5, 1993, Pat. No. 5,391,147, which is a continuation-in-part of Ser. No. 134,487, Oct. 12, 1993, Pat. No. 5,389,073, which is a continuation of Ser. No. 983,962, Dec. 1, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 382,622

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—95 **5 Claims**

1. A steerable catheter comprising a flexible elongate tubular member having proximal and distal extremities, a handle secured



to the proximal extremity of the flexible elongate tubular member, said flexible elongate tubular member having a lumen extending therethrough, a mandrel slidably mounted in the lumen and extending into the distal extremity of the flexible elongate tubular member, means carried by the handle for causing slidable movement of the mandrel to determine the location of a bend to be formed in the distal extremity of the flexible elongate tubular member and operable means accessible from the handle extending through the flexible elongate tubular member for causing bending of the distal extremity of the flexible elongate tubular member with respect to the mandrel slidably mounted on the lumen to form a bend in the desired location in the distal extremity of the flexible elongate tubular member therein.

5,588,965

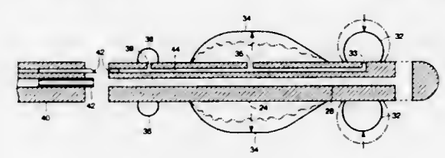
DEVICE FOR SLOWLY DILATING THE PROSTATIC URETHRA

John H. Burton, and Bradford G. Staehle, both of Minnetonka, Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Filed Mar. 7, 1995, Ser. No. 399,789

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—101 **20 Claims**



1. A device for slowly dilating an obstructed portion of a urethra which comprises,

a urinary catheter for insertion into the urethra, said catheter having a proximal portion and a distal portion;

dilation means capable of expanding radially outwardly, said means being disposed between said proximal and distal portion and having a length of at least that of the obstructed portion of the urethra;

pressure responsive means which is capable of sequentially contracting under pressure;

conduit means which maintains fluid communication between said pressure responsive means and said dilation means, thereby enabling fluid to flow from said pressure responsive means, when the latter is contracing under pressure, into said dilation means to cause the latter to gradually expand radially outawardly until dilation of the obstructed portion of the urethra occurs to a desired diameter and configuration; and

positioning means located on said catheter for positioning said device in the urethra, such that said dilation means is located in the obstructed portion of the urethra.

5,588,966

DEVICE FOR REMOVING A NEEDLE FROM A SYRINGE

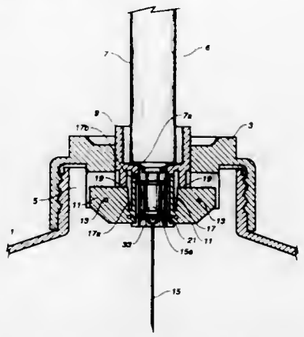
Haruo Atsumi, Shizuoka-ken, Japan, assignor to A.C.E. Corporation, Shizuoka-ken, Japan

Filed Jul. 13, 1995, Ser. No. 502,309

Claims priority, application Japan, Jul. 25, 1994, 6-192798

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **4 Claims**



1. A device for removing a needle from a syringe, the needle being non-threadedly attached to the syringe, the device comprising a supporting member, a syringe barrel receiving means attached to said supporting member slidably in a direction aligned with a longitudinal axis of the syringe, a first rotatable member having a needle removing means for pushing the needle from the syringe, a second rotatable member having a needle removing means for pushing the needle from the syringe in cooperation with said needle removing means of said first rotatable member, each of said rotatable members being attached to said supporting member so as to have an axis of rotation which is transverse to the longitudinal axis of the syringe, said rotatable members further having a spring means for keeping said rotatable members in contact with a portion of said syringe barrel receiving means and for returning said rotatable members and said syringe barrel receiving means to their original positions.

5,588,967

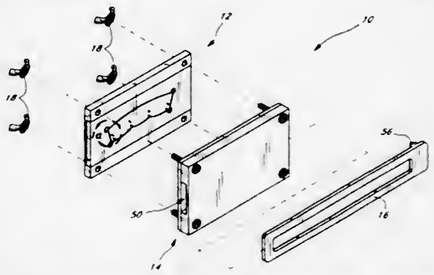
TISSUE CUTTING DIE

Steven K. Lemp, Santa Barbara; Philip J. Hudak, Burbank, and Charles S. Love, Newbury Park, all of Calif., assignors to Autogenics, Inc., Glasgow, United Kingdom

Continuation of Ser. No. 169,620, Dec. 17, 1993, Pat. No. 5,425,741. This application Apr. 10, 1995, Ser. No. 419,035

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—167 **13 Claims**



1. An apparatus for quickly and precisely cutting a piece of autologous, homologous, or heterologous tissue to a desired spatial

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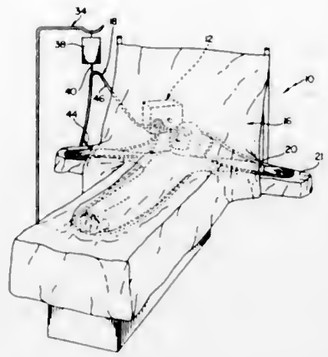
configuration, said apparatus applying a consistent cutting force substantially independent of the force applied by the operator so that the tissue is substantially completely and automatically cut along the perimeter of said desired spatial configuration, said apparatus comprising:

a cover;

a blade defining the perimeter of the desired spatial configuration, said blade supported by said cover, and means for sequentially forcing segments of a larger piece of said tissue against said blade so that said blade precisely cuts a smaller portion of tissue out of said larger tissue piece by shearing said larger tissue piece substantially along the entire perimeter of said blade.



5,588,968

METHOD FOR CONTROLLING THE BODY TEMPERATURE OF A PATIENT

Andrew L. Sternlicht, 355 Jerusalem Rd., Cohasset, Mass. 02025

Division of Ser. No. 911,897, Jul. 10, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,297

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—107 **7 Claims**

1. A method for controlling the body temperature of a patient being disposed on a supporting surface and having a perimeter as defined by an outline of the patient on the supporting surface comprising:

a) positioning an air hose having a plurality of side apertures on the supporting surface so that the air hose extends along at least a portion of the perimeter of the body of the patient;

b) filtering and heating air;

c) supplying the filtered and heated air to the air hose so that at least a portion of the filtered and heated air is dispensed through the apertures adjacent the portion of the perimeter of the body of the patient and

d) positioning a surgical drape over the portion of the body of the patient for retaining a portion of the filtered and heated air dispensed from the air hose adjacent the patient and for maintaining the sterility of a surgical site on the body of the patient.

5,588,969

METHOD FOR SUPPLYING PHOSPHOROUS VAPOR

James N. Baillargeon, Springfield, and Alfred Y. Cho, Summit, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 29, 1995, Ser. No. 412,678

Int. Cl.[6] B01D *7/00;* **C01B** *25/02*

U.S. Cl. 23—294 R **9 Claims**

1. A method for supplying phosphorous vapor comprising the steps of:

heating red phosphorous in a low pressure chamber to produce phosphorous vapor;

permitting said phosphorous vapor to directly flow into contact with a cooling unit in said low pressure chamber in order to quickly cool said vapor to selectively condense the white allotrope of phosphorous, and

permitting a flow of phosphorous vapor from said white phosphorous allotrope.

5,588,970

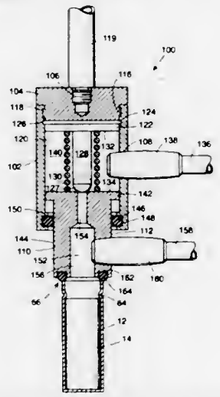
METHOD FOR VACUUM FILLING AND SEALING OF A BATTERY CELL

Elmer Hughett, Rte. 1, Box 151EC, Huntsville, Tenn. 37756, and Richard B. Alexandres, 5193 Lakeview Dr., Clear Lake, Iowa 50428

Continuation-in-part of Ser. No. 271,416, Jul. 6, 1994, Pat. No. 5,532,057. This application Jun. 7, 1995, Ser. No. 484,079

Int. Cl.[6] H01M *2/04;2/36*

U.S. Cl. 29—623.2 **2 Claims**



1. A method of sealing and closing an open end of a battery cell casing containing battery components, comprising:

a. positioning said open end of said battery cell casing in a closing fixture having an evacuation passage and a swage insert;

b. subjecting said open end of said battery cell casing to a vacuum;

c. placing a seal into said open end of said battery cell casing;

d. swaging said battery cell casing over and about said seal; and,

e. removing said battery cell casing from said closing fixture.

5,588,971

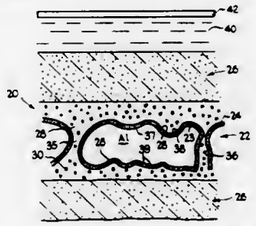
CURRENT COLLECTOR DEVICE AND METHOD OF MANUFACTURING SAME

Denis G. Fauteux, Acton; Arthur A. Massucco, Natick; Ronnie D. Wilkins, Melrose, and Jie Shi, Arlington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Oct. 19, 1994, Ser. No. 325,994

Int. Cl.[6] H01M *4/04*

U.S. Cl. 29—623.5 **8 Claims**



1. A method of manufacturing an aluminum current collector for use in a lithium electrolytic cell, wherein the aluminum current collector includes an hydrophobic surface layer and a native oxide layer thereon, the method comprising the steps of:

reducing the native oxide layer from the aluminum current collector to, in turn, lower interfacial impedance of the aluminum current collector;

converting the hydrophobic surface layer of the aluminum current collector to a surface layer which is hydrophilic;

chemically etching a plurality of pores in the aluminum current collector;

precluding re-growth of an oxide layer on the surface of the aluminum current_ collector by applying, and, in turn, adhering, a primer material suspended in an anhydrous solution to the hydrophilic surface of the aluminum current collector, and

evaporating the solvent from the anhydrous solution.

5,588,972

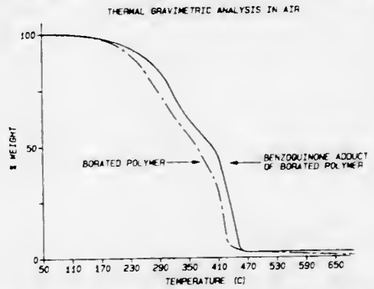
ADDUCTS OF QUINONE COMPOUNDS AND AMINE-CONTAINING POLYMERS FOR USE IN LUBRICATING OILS AND IN FUELS

Abhimanyu O. Patil, Westfield, and Frank Femino, Kearney, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 23, 1994, Ser. No. 344,775

Int. Cl.[6] C10L *1/22;* **C10M** *149/14*

U.S. Cl. 44—312 **20 Claims**



1. An oil soluble adduct useful as a fuel additive or lubricating oil additive comprising the reaction product of:

at least one quinone compound having at least one hydrogen on the quinone ring; and

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an amine-containing polymer having within its structure at least one reactive amino group selected from the group consisting of primary amino groups, secondary amino groups and mixtures thereof, the amine-containing polymer being derived from a hydrocarbon polymer having a number average molecular weight of from about 700 to 15,000, the amine-containing polymer comprising the acylated amine reaction product of hydrocarbon polymer-substituted mono- or dicarboxylic acid producing material and an amine compound containing at least two reactive amino groups selected from the group consisting of primary amino groups, secondary amino groups, and mixtures thereof.

5,588,973

FUEL COMPOSITIONS CONTAINING A POLYISOBUTENE SUCCINIMIDE DETERGENT

John R. Blackborow, Edinburgh, Scotland, and Michael J. Clarke, Burton Pidsea, England, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 40,162, Mar. 30, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 482,744

Claims priority, application United Kingdom, Apr. 10, 1992, 9208034

Int. Cl.[6] C10L *1/22*

U.S. Cl. 44—347 **14 Claims**

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel and, in an amount to provide detergency, a polyisobutene succinimide derived from the reaction of a polyisobutene-substituted succinic acylating agent and an amine having at least one reactive hydrogen bonded to an amine nitrogen wherein the polyisobutene-substituted succinic acylating agent is obtained by a thermal route thus avoiding halogen contamination and the polyisobutene substituent is derived from a highly reactive polyisobutene having greater than 50% of the residual olefinic double bonds represented by the formula $—CH_2CMe=CH_2$.

5,588,974

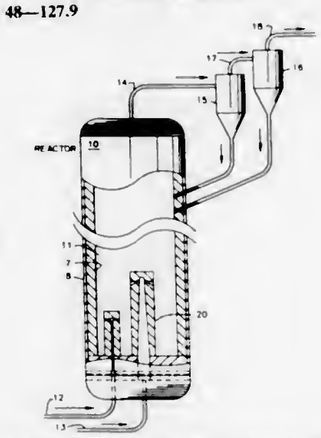
PROCESS, AND APPARATUS, FOR THE INJECTION OF PREHEATED OXYGEN INTO A HIGH TEMPERATURE REACTOR

Mark L. Tiller; James H. Taylor; Geoffrey R. Say; Norman J. Eger; Lawrence J. Delaune, and Gerald A. Wilcox, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 4, 1995, Ser. No. 416,622

Int. Cl.[6] B01J *8/18*

U.S. Cl. 48—127.9 **14 Claims**



1. In a fluidized bed reaction vessel constituted of walls enclosing a reaction chamber, with outlets, and inlets for the introduction of a low molecular weight hydrocarbon feed, steam, and oxygen, or a low molecular weight hydrocarbon feed and oxygen, for reaction at temperatures ranging form about 1500° F. to about 2500° F., or higher, to produce hydrogen and carbon monoxide the improved combination comprising

a nozzle inlet, or nozzle inlets, into the reactor through which high purity preheated oxygen can be introduced into the reaction chamber which comprises

a tubular body constituted of an alloy sufficient to withstand the oxidizing heat of the preheated oxygen without igniting and burning the alloy composition, the axial opening providing an inlet for introducing the preheated oxygen, and an oxygen outlet,

a plurality of small diameter tubes smaller than the axial opening, constituted of an alloy composition as defined by that of which said tubular body is constituted, communicated with said oxygen outlet, disposed upon the tubular body, and inclined downwardly at an angle, as measured from a line perpendicular to the axial opening through the tubular body, ranging from about 15° to about 60°,

refractory sleeves concentrically fitted upon the small diameter tubes such that a terminal end thereof projects outwardly beyond the terminal end of a small diameter tube a distance, d, which is at least equal to the inside diameter of a small diameter tube, sufficient to suppress ignition, burning or weakening of the alloy by the high temperature, and solids formation at the tips of the small diameter tubes, and

an encapsulating refractory which surrounds the tubular body, plurality of small diameter tubes, and refractory sleeves to protect the nozzle against the intense heats of reaction, while the low molecular weight hydrocarbon feed and steam, or low molecular weight hydrocarbon feed, is fed into the reaction chamber via a different nozzle inlet.

5,588,975

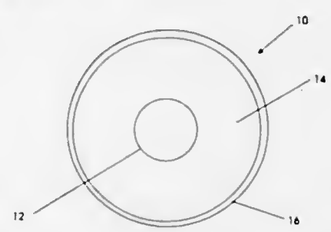
COATED GRINDING TOOL

Mark S. Hammond, Houston, Tex., and Joseph D. Evans, Lafayette, Colo., assignors to SI Diamond Technology, Inc., Austin, Tex.

Filed May 25, 1995, Ser. No. 452,572

Int. Cl.[6] B24D *5/00;3/06*

U.S. Cl. 51—293 **12 Claims**



8. A method for manufacturing a grinding tool having a working surface comprised of a composite material, the composite material comprised of hard particles and a metal or metal alloy bonding material, said method comprising:

placing the working surface in a vacuum chamber with at least two cathodes of different transition metals;

introducing a reactive gas at a controlled pressure and concentration into the chamber; and

striking arcs with the cathodes while moving said working surface and to deposit a modulated composition of reaction products of the transition metals and the reactive gas on the working surface.

5,588,976

AIR FILTRATION MEDIA

Donald L. Miller, Defiance, Ohio, assignor to Schuller International, Inc., Denver, Colo.

Division of Ser. No. 168,746, Dec. 16, 1993, Pat. No. 5,454,848, which is a continuation-in-part of Ser. No. 40,783, May 19, 1993, abandoned. This application Jun. 8, 1995, Ser. No. 488,984

Int. Cl.[6] B01D *46/00*

U.S. Cl. 55—514 **2 Claims**

1. A fiber glass air filtration media consisting essentially of: a blanket of glass fibers wherein about 25% to 35% by weight of the glass fibers are fine glass fibers having an average diameter between 1 and 3 microns and about 65% to 75% by weight of the glass fibers are coarse glass fibers having an average diameter between 4 and 6.5 microns, the fine glass fibers and the coarse glass fibers being randomly intermingled in the blanket, the fine glass fibers and the coarse glass fibers being adhesively bonded together in the blanket with a binder, the blanket having a thickness ranging from about 0.11 to about 1.50 inches, the blanket having a density between about 0.4 and about 1 pounds per cubic foot, and a porous, air permeable, backing mat adhesively bonded to one surface of the blanket by the binder.

5,588,977

METHOD OF PRODUCING GLASS MATERIALS FROM ASH-SLAG WASTE

Vyacheslav F. Pavlov; Vasily F. Shabanov; Alexandr G. Anshits, and Sergei G. Bayakin, all of Krasnoyarsk, Russian Federation, assignors to East West Trade Group, Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 144,476, Nov. 2, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,638

Int. Cl.[6] C03B *19/08*

U.S. Cl. 65—17.4 **11 Claims**

1. A method of producing foamed glass materials from ash-slag waste derived from burning coals comprising the steps of:

a) providing a charge of the ash-slag waste including calcium oxide and iron oxide in the following amounts of wt %:

CaO total	5.0–41.0
CaO unbound	4.0–13.0
Fe_2O_3	1.0–24.0

b) heating and melting the charge; and

c) forming said foamed glass material by pouring said melted charge into a water bath;

d) wherein, prior to said heating and melting of the charge, a carbon content of the charge is adjusted to an amount effective to reduce the Fe_2O_3 content of the charge to less than 1% by weight and to form carbides in said melt whereby a gaseous medium is generated from the carbides to foam said melt to produce the foamed glass materials.

5,588,978

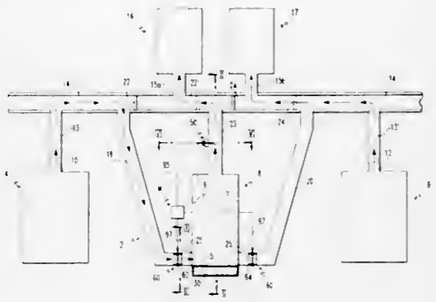
PROCESS AND APPARATUS FOR COLORING GLASS

Ronald D. Argent, Green County, Pa., and James A. Bolin, Tulsa County, Okla., assignors to IMTEC, Tulsa, Okla.

Continuation-in-part of Ser. No. 981,854, Nov. 24, 1992, abandoned. This application May 19, 1994, Ser. No. 246,064

Int. Cl.[6] C03B *5/16;5/18;5/24;7/00*

U.S. Cl. 65—29.1 **16 Claims**



1. Apparatus for coloring glass in the manufacture of glassware articles comprising:

at least one transport channel adapted to receive molten glass from a glass melting furnace;

a color treatment chamber having a floor, a charging end and an outlet end, joined by opposed side walls enclosed by a roof and defining a horizontally extending glass containment region therein, said chamber further having an inlet formed therein for receiving molten glass from said at least one transport channel;

means for abetting a flow of molten glass in said at least one transport channel;

charger means at a charger end of said color treatment chamber for introducing cullet and a color additive into the said containment region in said color treatment chamber;

heater means associated with said color treatment chamber to melt said cullet supplied to said containment region of said color treatment chamber and to further heat the molten glass and color additive to form a molten bath of colored glass in said containment region;

means associated with said containment region of said color treatment chamber for homogenizing the color and temperature of the molten both of colored glass in said containment region; and

a distribution channel positioned and arranged at said outlet end of said color treatment chamber communicating with said containment region of said color treatment chamber for delivery of said molten colored glass to at least one remotely located glassware forming machine and positioned and arranged at an outlet of said glass melting furnace and at an inlet of said at least one transport channel to receive molten glass from said glass melting furnace and to supply said molten glass from said glass melting furnace to said at least one transport channel and to said at least one remotely located glassware forming machine,

the means for abetting a flow of molten glass in said at least one transport channel comprising a paddle wheel rotatably mounted in said at least one transport channel, a varible speed drive means operatively connected with said paddle wheel for rotating said paddle wheel, said paddle wheel having a plurality of radially extending vanes for engagement with molten glass in said at least one transport channel, and a sensor and control means for determining a level of glass in said distribution channel and for regulating said variable speed drive means to selectively increase or decrease the speed of rotation of said paddle wheel in response to a predetermined glass level.

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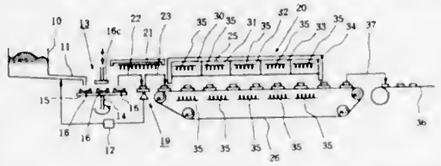
5,588,979

APPARATUS FOR CONTINUOUSLY FORMING AND PROCESSING A GLASS-CERAMIC

Mutsumi Miyazaki, and Toshiaki Yoshida, both of Sagamihara, Japan, assignors to Kabushiki Kaisya Ohara, Kanagawa-Ken, Japan

Continuation-in-part of Ser. No. 175,960, Dec. 30, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,387
Claims priority, application Japan, Nov. 8, 1993, 5-278165
Int. Cl.[6] C03B *11/00*
U.S. Cl. 65—164 **6 Claims**



1. An apparatus for continuously forming and processing a glass-ceramic comprising:

melting means for melting raw materials for a glass-ceramic into a melted glass;

a flow tube for conveying the melted glass flowing out of the melting means, said flow tube having a melted glass inlet and a melted glass outlet, inclining downwardly toward the melted glass outlet and having an inner diameter which becomes smaller toward the melted glass outlet, a cross section of said melted glass inlet being larger than a cross section of said melted glass outlet;

flow quantity control means connected to said flow tube for controlling the quantity of said melted glass flowing through said flow tube;

press means provided in a posterior stage to said flow tube for pressing the melted glass from the flow tube into a predetermined form;

glass preform checking means provided for measuring the weight or volume of a glass preform provided by the pressing means and for feeding back a difference signal corresponding to a difference between the measured value of the weight or volume and a reference value of the weight or volume to the flow quantity control means, said flow quantity control means controlling the quantity of the melted glass flowing through the flow tube in response to the difference signal to reduce the difference between the measured value and the reference value; and

crystallizing means provided in a posterior stage to the glass preform checking means for crystallizing the glass preform.

5,588,980

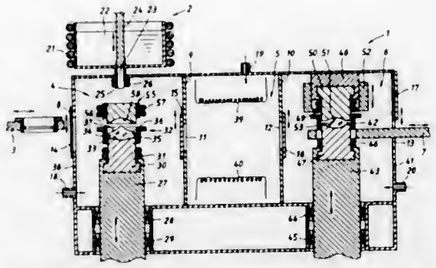
APPARATUS FOR MOLDING A GLASS OPTICAL ELEMENT WITH A TRANSPORTING SUPPORTING MEMBER

Hiroshi Ito, Hachiohji, Japan, assignor to Olympus Optical Co., Ltd, Japan

Division of Ser. No. 20,649, Feb. 22, 1993, Pat. No. 5,378,255. This application Sep. 15, 1994, Ser. No. 306,462
Claims priority, application Japan, Feb. 21, 1992, 4-072434
Int. Cl.[6] C03B *11/00*
U.S. Cl. 65—223 **18 Claims**

1. An apparatus for molding an optical element from molten glass, comprising:

a glass ejection chamber including a receiving mold part having an end surface for receiving the molten glass, the end surface having a shape that substantially conforms to one of two major surfaces of the optical element, and a supporting member having an opening so as to expose the end surface of the receiving mold part when the supporting member is detachably mounted on the receiving mold part for receiving a desired amount of molten glass;



a heating chamber connected to the glass ejection chamber for heating the glass, the heating chamber having a heating furnace for receiving the glass from the glass ejection chamber while the glass is separated from the receiving mold part and is supported on the supporting member;

a precision press chamber connected to the heating chamber for receiving the heated glass supported on the supporting member from the heating chamber and for molding the glass into the optical element, the precision press chamber including a pair of mold parts having molding surfaces each having a shape that substantially conforms to a respective one of the two major surfaces of the optical element; and

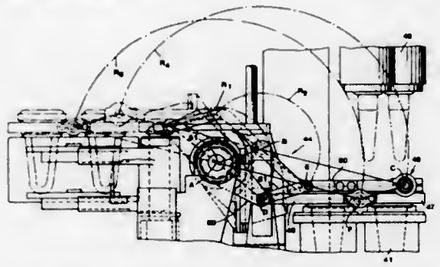
transport means movable into the glass ejection chamber, the heating chamber and the precision press chamber for transporting the supporting member.

5,588,981

APPARATUS FOR FORMING WIDE MOUTH GLASSWARE

Wayne E. Eilers, Perrysburg, Ohio, assignor to Owens-Brockway Glass Container Inc., Toledo, Ohio

Filed Jul. 28, 1994, Ser. No. 281,718
Int. Cl.[6] C03B *9/193*
U.S. Cl. 65—241 **23 Claims**



1. An apparatus for making wide-mouth glassware comprising

a solid blank mold,

a split blow mold comprising mold halves,

a split neck ring,

a plunger carrier having a movable plunger therein,

means for positioning the neck ring on said blank mold,

means for delivering a gob of glass to said blank mold,

means for positioning said plunger carrier into engagement with said neck ring such that the plunger extends into the blank mold to a first position,

said plunger carrier including means for extending the plunger further into said blank mold to a first position to deform the glass and force the glass into the neck ring to form a parison, and retracting the plunger and moving the plunger carrier away from the neck ring,

means for moving the neck ring with the parison thereon to a position between the open blow mold halves while maintaining the parison in vertical upright position and returning the neck ring to it original position adjacent the blank mold while the parison is being blown,

means for opening the neck ring to release the parison in the blow mold,

means for closing the blow mold about the parison and blowing the parison into a hollow glass article,

said plunger extending from said plunger carrier such that the plunger begins to press glass as the plunger carrier moves into engagement with said neck ring,

said plunger carrier including means for aligning the plunger carrier with said neck ring,

said plunger carrier including means yieldingly engaging said neck ring,

a neck ring arm, means pivoting said neck ring arm about a first fixed horizontal axis, a neck ring holder for holding said neck ring, means pivotally supporting said neck ring holder on said neck ring arm,

means for moving said blank mold upwardly into position for receiving the glass gob,

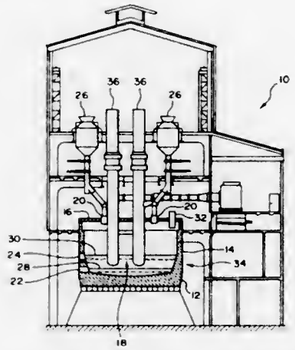
said means for moving the neck ring with the parison thereon to a position between the open blow mold halves while maintaining the parison in vertical upright position comprising a transfer arm, means pivoting one end of the transfer arm about a second fixed horizontal axis spaced from the first horizontal axis, means pivoting the other end of the transfer arm to the neck ring holder, means pivotally connecting said transfer arm to said first horizontal axis such that the pivotal movement of said neck ring arm about said first horizontal axis causes said transfer arm to move about said second horizontal axis and maintain said parison in vertical upright position as the neck ring is moved to a position between the open blow mold.

5,588,982

PROCESS FOR PRODUCING FOUDRY IRON

Charles F. Hendrix, Pell City, Ala., assignor to Alabama Power Company, Birmingham, Ala.

Filed May 1, 1995, Ser. No. 431,845
Int. Cl.[6] C21B *11/10*
U.S. Cl. 75—10.50 **34 Claims**



1. A process of producing foundry iron comprising the steps of:

feeding a charge into a submerged arc furnace about electrodes thereof, said charge comprising a mixture of an iron source, a silicon source and a carbonaceous reducing agent, said iron source comprising scrap iron or steel,

supplying electrical energy to said electrodes to generate an electrical arc therebetween, and

heating the scrap iron or steel, the silicon source and the carbonaceous reducing agent in the furnace by the electrical arc between the electrodes to melt the scrap iron or steel and to produce foundry iron having a silicon content of about 0.05 percent to about 9.5 percent by weight.

5,588,983

PRODUCTION OF COPPER POWDER

Hiroji Tani, and Kazuhito Oshita, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 16, 1995, Ser. No. 389,285
Claims priority, application Japan, Feb. 16, 1994, 6-019196
Int. Cl.[6] B22F *9/04*
U.S. Cl. 75—354 **7 Claims**

1. A method for producing copper powder comprising the steps of:

providing a mixture consisting of copper powder and 0.1 to 3 wt % stearic acid; and

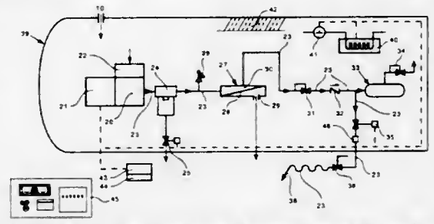
ball milling said mixture until the copper powder has formed a fine powder with a particle size range from 0.3 to 7 microns.

5,588,984

APPARATUS AND METHOD TO INTERMITTENTLY MANUFACTURE AND DISPENSE NITROGEN

Nicholas A. Verini, 404 Lone Eagle Point, Lafayette, Colo. 80026

Filed Jul. 18, 1995, Ser. No. 503,596
Int. Cl.[6] B01D *53/22*
U.S. Cl. 95—15 **19 Claims**



1. A method for intermittent and automatic separating and storing nitrogen from air comprising the steps of:

(a) compressing and introducing said air into a module containing a permeable membrane means for separating said nitrogen from said air,

(b) said permeable membrane means separating said nitrogen from said air permitting oxygen, carbon dioxide, moisture and other gases to pass through said membrane means while enriching said nitrogen to a desired purity by removing other air components,

(c) providing an automatic means for controlling nitrogen pressure in said module,

(d) providing a means for containing and controlling the temperature of said air, said nitrogen, and said module,

(e) storing said nitrogen for intermittent discharge,

(f) providing a means for automatically controlling and discharging desired amounts of said nitrogen and,

(g) providing conduit to contain said air and said nitrogen in said apparatus when necessary until discharge.

5,588,985

METHODS OF USING A PORTABLE FILTRATION UNIT

David M. Shagott, Duluth; Gary E. Kruse, Lawrenceville, both of Ga.; Blair L. Harber, Jr.; Daniel N. Sutherland, both of Ontario, Canada, and Terrell F. Travis, Oxford, Miss., assignors to Abatement Technologies, Inc., Lawrenceville, Ga.

Continuation-in-part of Ser. No. 97,753, Jul. 26, 1993, Pat. No. 5,433,763, which is a continuation-in-part of Ser. No. 766,000, Sep. 26, 1991, Pat. No. 5,230,723, which is a continuation-in-part of Ser. No. 613,212, Nov. 14, 1990, Pat. No. 5,069,691. This application Apr. 6, 1995, Ser. No. 418,249
Int. Cl.[6] B01D *35/143*
U.S. Cl. 95—25 **9 Claims**

1. A method of cleaning HVAC ductwork containing fluid and particles comprising the steps of:

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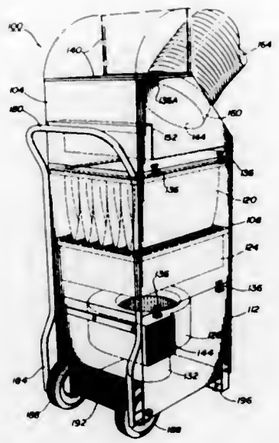


a. transporting to a site first and second modular assemblies, each having an inlet, an outlet, a surface, and a plurality of sides;

b. placing the outlet of the first modular assembly in fluid communication with the inlet of the second modular assembly;

c. detachably rigidly sealing the first modular assembly to the second modular assembly in fluid communication therewith to form a housing having a length and width and comprising:

i. a filtration system comprising:

A. a first filter; and

B. a HEPA filter;

ii. means for maintaining the first filter within the housing between the inlet of the first modular assembly and the HEPA filter so as to encounter fluid entering the inlet before the fluid encounters the HEPA filter;

iii. means, comprising a motor, for drawing a substantial volume of fluid through the filtration system;

iv. an external control panel comprising means for indicating any substantial disruption of fluid flow through the filtration system;

v. a plurality of external wheels; and

vi. external means, protruding from the housing intermediate the external wheels and providing a bearing surface when the housing is tilted, for facilitating conveying the housing up and down stairs;

d. attaching one end of a length of hose to the HVAC ductwork and the other end to a rim connected to the surface and circumscribing the inlet of the first modular assembly;

e. connecting the drawing means to a source of electricity, thereby:

i. causing fluid and particles within the HVAC ductwork to enter the length of hose and the inlet of the first modular assembly;

ii. drawing the fluid having entered the inlet of the first modular assembly through the first filter to remove and retain therein a portion of the particles;

iii. thereafter drawing the fluid and at least some of the remaining particles through the HEPA filter to remove and retain therein a substantial portion of the remaining particles;

iv. exhausting the fluid through the outlet of the second modular assembly; and

v. rendering operational the means for indicating any substantial disruption of fluid flow through the filtration system; and

f. tilting the housing so that any stairs present at the site bear against the bearing surface of the external conveyance-facilitating means as the housing is transported up and down the stairs.

5,588,986

MASS OR ENERGY TRANSFER PROCESS USING FLUIDIZED BED

Howard P. Davis, Petersham Richmond, England, and Wolfram Ruff, Stade, Germany, assignors to Euro-Matic Ltd., London, England, and VAW Aluminium AG, Bono, Germany

Continuation-in-part of Ser. No. 76,481, Jun. 14, 1993, Pat. No. 5,376,165, which is a continuation of Ser. No. 767,043, Aug. 2, 1991, abandoned. This application Dec. 27, 1994, Ser. No. 364,220

Int. Cl.[6] B01D *47/14;53/14*

U.S. Cl. 95—211 **33 Claims**

1. A method for performing a process selected from the group consisting of scrubbing, stripping, or heat transfer, wherein a gas stream is flowed through a column having a bed comprising fluidizable hollow packing elements, and a liquid stream is flowed through in a direction countercurrent to said gas stream into said column, said liquid stream having a liquid flow L and said gas stream having a gas flow G sufficient to maintain said bed in a fluidized state and a superficial gas velocity v; comprising

(a) selecting an unknown value selected from the group consisting of L/G, v, ρ_p, ψ, s, ρ_g and ρ_L so that the following equation is satisfied for a predetermined value of $\Delta P/H_0$ greater than 1300 Pa/m^3:

$$\frac{\Delta P}{H_o} = v\left\{\frac{C_1\rho_p g}{\psi s} + \frac{C_2\rho_g g}{\psi} + C_3\rho_L g\left[\frac{L}{G}\right]\right\}$$

wherein

ΔP is the pressure drop across the bed;

H_0 is the bed height in a state of rest;

C_1 is a numerical constant;

C_2 is a numerical system constant having units of seconds/meter or equivalent;

C_3 is a system constant having units of seconds/meter;

s is an element slip function in units of meters/second or equivalent;

ψ is a shape factor calculated as follows:

y/x, wherein x is the length of the short axis of the packing elements and y is the length of the long axis of the packing elements;

ρ_p is the density of the packing elements;

ρ_g is the density of the gas;

ρ_L is the density of the liquid;

g is the gravitational constant; and

(b) carrying out said process in accordance with said selection.

5,588,987

DISCHARGE STREAM CONDITIONER AND METHOD

Paul O. Huston, 220 Snake Hill Rd., Trussville, Ala. 35173

Filed Oct. 14, 1994, Ser. No. 321,840

Int. Cl.[6] B01D *19/00*

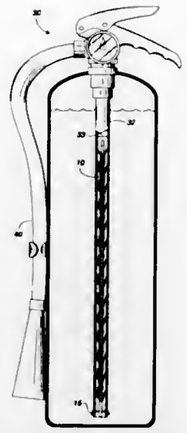
U.S. Cl. 95—260 **12 Claims**

1. A discharge stream conditioner positioned in a pressurized liquid containment vessel comprising a tank filled with pressurized liquid, a syphon tube extending into said liquid, a valve means and a discharge means, said discharge stream conditioner being frictionally positioned within said syphon tube and comprising an elongated rod having a plurality of radiating, cambered, fingers attached thereto and extending outwardly therefrom and arranged in a repetitive, continuous spiral beginning at one end of said rod and continuing uninterrupted toward the opposite end of said rod so that at least a portion of said fingers are caused to frictionally engage the interior wall of said syphon tube.

11. A method of effectuating a partial separation of gas molecules dissolved in a liquid under pressure during discharge of said liquid from a pressurized liquid containment vessel having a tank filled with said liquid, a syphon tube, a valve means and a discharge means, said method comprising the steps of:

frictionally inserting an elongated rod having a plurality of radiating, cambered, fingers attached thereto and extending outwardly therefrom into said syphon tube and the discharge flow path of said liquid and arranged in a repetitive, continuous spiral beginning at one end of said rod and continuing uninterrupted toward the opposite end of said rod so that at least a portion of said fingers are caused to frictionally engage the interior wall of said syphon tube; and,

causing said liquid to flow or be discharged from said liquid containment vessel through said syphon tube and over and along the longitudinal axis of said rod and through said radiating fingers.



5,588,988

THERMAL DESORPTION DEVICE FOR A GAS CHROMATOGRAPH

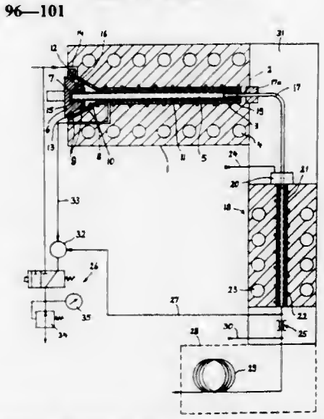
Eberhard Gerstel, An der Halde 49, 45475 Mulheim/Ruhr, and Ralf Bremer, Witthausstr. 29, 45470 Mulheim/Ruhr, both of Germany

Filed Jun. 5, 1995, Ser. No. 461,869

Claims priority, application Germany, Jun. 3, 1994, 44 19 596.6

Int. Cl.[6] B01D *15/08*

U.S. Cl. 96—101 **11 Claims**



1. A thermal desorption device for a gas chromatograph comprising:

an oven;

a holding chamber having an open receiving portion;

an interchangeable sample holder tube, having a first end and a second end, receivable by said holding chamber;

a sample holder tube holder piece for engagement with said receiving portion of said holding chamber and having a proximal and a distal end, said distal end including a recess for placement of said first end of said sample holder tube;

a first seal near said proximal end of said holder piece, for externally sealing said holding chamber;

a second seal near said distal end of said holder piece;

a first annular gap located around that portion of said holder piece between said first and second seals;

a carrier gas connection opening in the region of said first annular gap;

a third seal in said recess surrounding said sample holder tube at a point near said distal end of said holder piece, forming a seal between said sample holder tube and said holder piece;

a second gap surrounding said first end of said sample holder tube up to said third seal;

a connection through said holder piece between said first and second gaps; and

a trap communication with the interior of said sample holder tube at said second end.

5,588,989

ZINC PHOSPHATE COATING COMPOSITIONS CONTAINING OXIME ACCELERATORS

Donald R. Vonk, Clinton Township, and Jeffrey A. Greene, Ferndale, both of Mich., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1994, Ser. No. 344,441

Int. Cl.[6] C23C *22/07*

U.S. Cl. 106—14.12 **33 Claims**

1. An aqueous acidic composition for forming a zinc phosphate coating on a metal substrate comprising about 0.4 to 3.0 grams per liter (g/l) of zinc ion, about 5 to 20 g/l phosphate ion, and as an accelerator, about 0.5 to 20 g/l of an oxime.

5,588,990

POZZOLAN CEMENT COMPOSITIONS AND ADMIXTURES THEREFOR

Jonathan E. Dongell, Scottsdale, Ariz., assignor to Universal Cement & Concrete Products, Inc., Glendale, Ariz.

Filed Nov. 3, 1995, Ser. No. 552,635

Int. Cl.[6] C04B *22/06*

U.S. Cl. 106—716 **30 Claims**

1. An admixture for subsequent addition to cement to create a blended cement, said blended cement having from about 15% to about 40% (w/w) of said admixture blended therein, said admixture comprising: from about 12.5% to about 67% (w/w) of calcined diatomaceous earth; from about 17.5% to about 67% (w/w) of calcined kaolin; from about 0% to about 22.5% (w/w) of talc; from about 0% to about 20% (w/w) of bentonite; and sufficient potassium to provide the blended cement with about 0.5% to about 4% (w/w) potassium.

5,588,991

PROCESS FOR PRODUCING CHLOROGALLIUM PHTHALOCYANINE CRYSTAL

Kazuya Hongo, and Hitoshi Takimoto, both of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 521,042

Claims priority, application Japan, Aug. 31, 1994, 6-229063; Feb. 21, 1995, 7-055234

Int. Cl.[6] C30B *3/00*

U.S. Cl. 117—2 **5 Claims**

1. A process for producing a chlorogallium phthalocyanine crystal, which comprises mechanically dry-grinding chlorogallium phthalocyanine with a grinding media to produce a crystal-converted chlorogallium phthalocyanine crystal, wherein the weight ratio of said chlorogallium phthalocyanine to said grinding media is from 1/5 to 1/1000.

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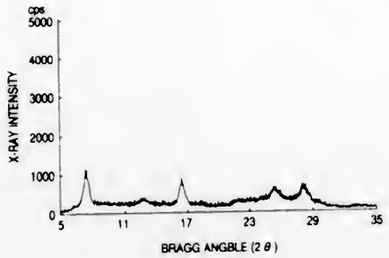


5,588,992

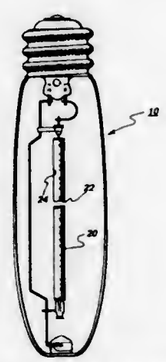
CONVERSION OF DOPED POLYCRYSTALLINE MATERIAL TO SINGLE CRYSTAL MATERIAL

Curtis E. Scott, Mentor; Mary Sue Kaliszewski, Cleveland Heights, both of Ohio, and Lionel M. Levinson, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 195,187, Feb. 14, 1994, Pat. No. 5,487,353. This application Nov. 3, 1995, Ser. No. 552,700

Int. Cl.[6] C30B *1/06*

U.S. Cl. 117—2 **14 Claims**



1. A solid state process for convening a polycrystalline ceramic body doped with a selected conversion-enhancing dopant at a selected concentration to a single crystal body comprising the steps of:

doping at least a portion of the polycrystalline ceramic material comprising said ceramic body with a conversion-enhancing dopant to a selected concentration; and

heating the doped polycrystalline body to a selected temperature to convert the portion of the polycrystalline body doped to said selected concentration to a single crystal structure, said selected temperature being above one-half of the melting temperature of said doped ceramic material but below the melting temperature of said doped ceramic material.

5,588,993

METHOD FOR PREPARING MOLTEN SILICON MELT FROM POLYCRYSTALLINE SILICON CHARGE

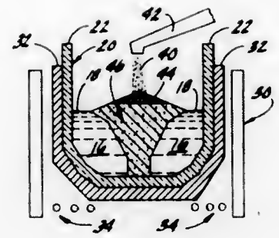
John D. Holder, Lake St. Louis, Mo., assignor to MEMC Electronic Materials, Inc.

Filed Jul. 25, 1995, Ser. No. 507,055

Int. Cl.[6] C30B *15/02*

U.S. Cl. 117—13 **40 Claims**

1. A process for preparing a pool of molten silicon in a crucible for use in growing a single crystal silicon ingot by the Czochralski method, the process comprising:



(a) forming a partially melted charge in a crucible, the partially melted charge comprising molten silicon having an upper surface and unmelted polycrystalline silicon exposed above the upper surface of the molten silicon;

(b) feeding polycrystalline silicon onto the exposed unmelted polycrystalline silicon; and

(c) melting the unmelted polycrystalline silicon and the polycrystalline silicon fed onto the exposed unmelted polycrystalline silicon to form a pool of molten silicon.

5,588,994

METHOD OF PRODUCING SHEETS OF CRYSTALLINE MATERIAL AND DEVICES MADE THEREFROM

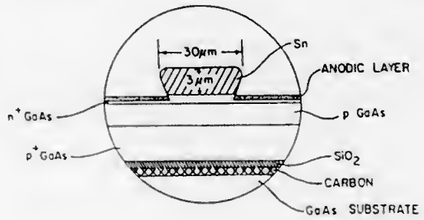
Carl O. Bozler, Sudbury; John C. C. Fan, Chestnut Hill, and Robert W. McClelland, Norwell, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 291,389, Aug. 16, 1994, which is a continuation of Ser. No. 31,536, Mar. 15, 1993, Pat. No. 5,362,682, which is a continuation of Ser. No. 770,599, Oct. 3, 1991, abandoned, which is a continuation of Ser. No. 128,637, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 251,214, Apr. 6, 1981, Pat. No. 4,727,047, which is a continuation-in-part of Ser. No. 138,891, Apr. 10, 1980, abandoned. This application Jun. 6, 1995, Ser. No. 468,530

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[6] C30B *29/06*

U.S. Cl. 117—89 **26 Claims**



1. An electronic device comprising:

a substrate for supporting the electronic device;

a first thin-film layer of semiconductor material, a second thin-film layer of semiconductor material, and a third thin-film layer of semiconductor material, each layer of semiconductor material comprising a respective electronic circuit having a thickness of about 10 microns or less; and

two layers of adhesive material, a first layer of adhesive material being between the first thin-film layer and the second thin-film layer of semiconductor material to attach the first and second thin-film layers of semiconductor material together to form a circuit structure and a second layer of adhesive material to attach the circuit structure to the third thin-film layer of semiconductor material to form the electronic device.

5,588,995

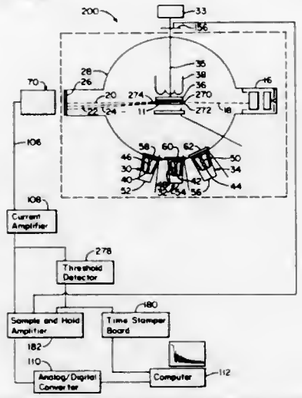
SYSTEM FOR MONITORING THE GROWTH OF CRYSTALLINE FILMS ON STATIONARY SUBSTRATES

Peter Sheldon, Lakewood, Colo., assignor to Midwest Research Institute, Kansas City, Mich.

Division of Ser. No. 69,405, Jun. 1, 1993, Pat. No. 5,456,205. This application May 3, 1995, Ser. No. 434,181

Int. Cl.[6] C30B *25/16*

U.S. Cl. 117—201 **21 Claims**



1. A monitoring apparatus for detecting intensity oscillations of a RHEED luminescent pattern on a screen that luminesces in response to impingement of electrons generated by an electron beam during growth of a crystalline film on a substrate, comprising:

focusing means for selecting a spot of the RHEED luminescent pattern on the screen at which luminescent intensity can be detected;

detector means for converting light emanating from said spot into an electronic signal indicative in real time of the luminescent intensity;

filter means for transmitting primarily light of the wavelength that are produced by the screen and that reflects or absorbs light of different wavelengths;

amplifying means for amplifying said electronic signal;

processing means for reading each oscillation cycle of intensity of the luminescent spot;

rotating means for rotating said substrate and crystalline film; and

sampling means for sampling said electrical signal instantaneously in synchronization with a revolution of said substrate and crystalline film.

5,588,996

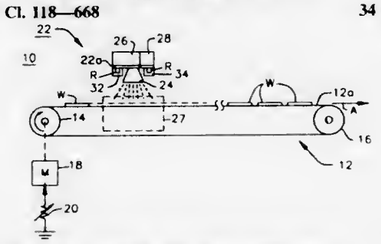
APPARATUS FOR SPRAY COATING FLAT SURFACES

Bernard J. Costello, Princeton, N.J., assignor to Argus International, Ringoes, N.J.

Filed Apr. 1, 1994, Ser. No. 222,125

Int. Cl.[6] B05C *11/00*

U.S. Cl. 118—668 **34 Claims**



1. Apparatus for coating workpieces comprising:

conveyor means for conveying workpieces in a given direction;

means for moving said conveyor means including means for adjusting the moving speed of said conveyor means;

a spray assembly including a spray head for producing a liquid spray in a given pattern;

means for delivering a coating liquid to said spray assembly;

means for reciprocably mounting said spray assembly above said conveyor means to deliver a liquid spray from said spray head downwardly toward an upper surface of a workpiece arranged on the conveyor means, said spray assembly being movable in a reciprocating fashion along a path transverse to said given direction;

means for reciprocating said spray assembly as said conveyor means is moving workpieces beneath said spray assembly and said spray assembly emits a spray of coating liquid;

means for adjusting the moving speed of said reciprocating means; and

means for adjusting outer limits of reciprocating movement of the spray assembly along said transverse path according to size and/or arrangement of workpieces on the conveyor means to maximize efficient use of spray liquid and reduce waste thereof as well as facilitating setup changes of said apparatus to accommodate different coating thicknesses and workpieces of differing sizes.

5,588,997

DEVICE FOR COATING AN OPTICAL FIBER

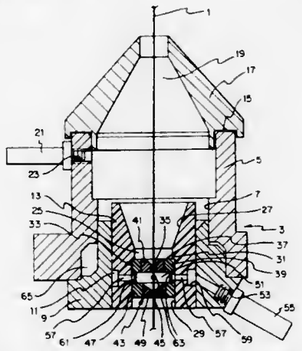
Hans-Jürgen Lysson, Korschenbroich; Reiner Broden, and Hans-Detlef Leppert, both of Mönchengladbach, all of Germany, assignors to Kabel Rheydt AG, Monchen-Gladbach, Germany

Filed Nov. 17, 1994, Ser. No. 341,477

Claims priority, application Germany, Nov. 18, 1993, 9317617 U

Int. Cl.[6] B05C *3/02*

U.S. Cl. 118—405 **13 Claims**



1. A device for coating an optical fiber, comprising

a housing having a lengthwise bore;

a nozzle holder, which is located in said lengthwise bore, said nozzle holder having a receiving aperture formed therein;

an inlet nozzle, having a first nozzle bore, received in one end of said receiving aperture;

an outlet nozzle, having a second nozzle bore, received in an opposite end of said receiving aperture;

said inlet nozzle and said outlet nozzle being arranged at a distance from one another with said first nozzle bore and said second nozzle bore being axially aligned such that an optical fiber can pass therethrough in a passage direction;

wherein a coating material is applied to the optical fiber while passing between said inlet nozzle and said outlet nozzle;

wherein the nozzle holder is press-fit into said lengthwise bore of said housing;

wherein said inlet nozzle and said outlet nozzle are press-fit into said receiving aperture of said nozzle holder; and

wherein said nozzle holder is made of a flexible plastic material having a low coefficient of friction, said material having a low

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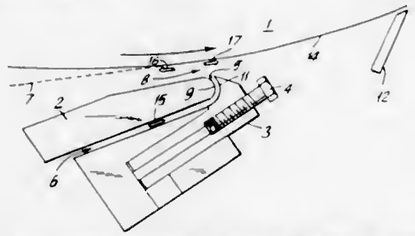
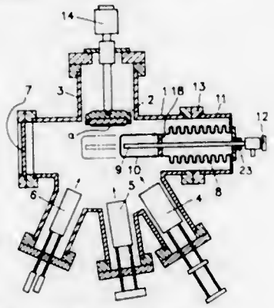
coefficient of friction simplifying the press-fit of said inlet and outlet nozzles into said receiving aperture of said nozzle holder, and said material having a low coefficient of friction providing a seal in a radial direction between said inlet and outlet nozzles and said nozzle holder to thereby prevent the passage of said coating material therebetween.

5,588,998
JET COATING APPARATUS
Jukka Koskinen, Helsinki, Finland, assignor to Valmet Corporation, Helsinki, Finland
Continuation-in-part of Ser. No. 142,728, Oct. 25, 1993, abandoned. This application Jun. 26, 1995, Ser. No. 494,365
Claims priority, application Finland, Oct. 26, 1992, 924841
Int. Cl.[6] B05C *5/00*
U.S. Cl. 118—410 **6 Claims**



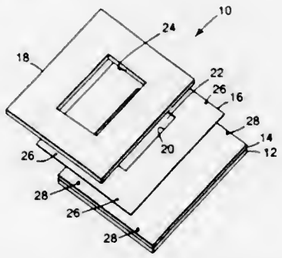
1. A jet coating apparatus for applying coating mix into a moving web in a noncontacting manner in ambient pressure without a pressurized coating chamber, said apparatus comprising:
an upper lip placed close to the web and having a slot orifice bounding surface; and
a lower lip situated in the vicinity of the upper lip and having a slot orifice bounding surface, the lower lip being arranged essentially on a trailing side relative to the moving direction of the web so that the slot orifice bounding surface of the upper lip and the slot orifice bounding surface of the lower lip form a slot orifice suited for feeding the coating mix onto the web without a pressurized chamber,
the slot orifice bounding surface moving direction of the web.

5,588,999
THIN FILM FORMING DEVICE
Hiroshi Takahashi, Ibaraki-ken, Japan, assignor to Eiko Engineering Co., Ltd., Ibaraki-ken, Japan
Filed Aug. 9, 1995, Ser. No. 513,153
Claims priority, application Japan, Jan. 17, 1995, 7-023543
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—715 **7 Claims**



1. A thin film forming device comprising:
a vacuum chamber which is vacuous inside;
a substrate holder provided in said vacuum chamber for holding a substrate;
an irradiation source of thin film material disposed in said vacuum chamber towards said substrate holder; and
an endoscope having a tip portion inserted close to a film-forming surface of said substrate in said vacuum chamber, said endoscope being disposed in a transparent protecting tube which separates said endoscope from an inner space of said vacuum chamber.

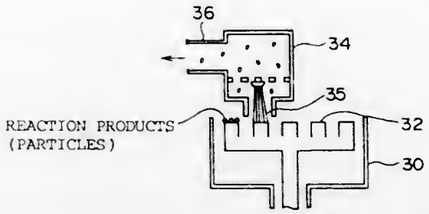
5,589,000
FIXTURE FOR DEPOSITION
Michael R. Harms, Woodbury; Richard J. Foss, Pine City; Jennifer L. Trice, Eagan, and Terence D. Neavin, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 6, 1995, Ser. No. 524,340
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—715 **21 Claims**



1. A fixture for use in deposition of a material over a substrate, the fixture comprising:
a first plate having a first side and a second side;
a second plate having a first side and a second side, wherein the first side of the second plate faces the first side of the first plate, the second side of the second plate supporting the substrate during deposition of the material over the substrate;
a plurality of thermoelectric devices disposed between the first plate and the second plate, the thermoelectric devices being in thermal communication with both the first plate and the second plate; and
a device for controlling each of the thermoelectric devices to generate thermal energy during deposition of the material over the substrate,
wherein a portion of the thermal energy is transferred to the substrate by the second plate and a portion of the thermal energy is transferred away from the thermoelectric devices by the first plate.

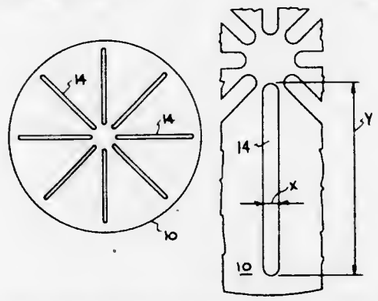
5,589,001
APPARATUS FOR FORMING A FILM ON A WAFER
Kazuo Maeda; Kouichi Ohira, and Hiroshi Chino, all of Tokyo, Japan, assignors to Canon Sales Co., Inc.; Alcan-Tech Co., Inc., and Semiconductor Process Laboratory Co., Ltd., all of Japan
Filed Nov. 30, 1993, Ser. No. 159,127
Claims priority, application Japan, Nov. 30, 1992, 4-320504
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—722 **8 Claims**

1. An apparatus for forming a film on a wafer substrate comprising:
a rotary shaft;
a gas distributor, for discharging a reaction gas, including a plurality of gas dischargers arranged in a circle around said rotary shaft;



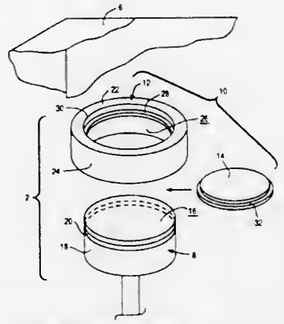
a wafer holder mounted on said rotary shaft for rotation relative to said gas distributor and including a plurality of wafer mounting surfaces arranged in a circle around said rotary shaft, said wafer mounting surfaces facing said gas dischargers;
vertical positioning means for moving either said gas distributor or said wafer holder between a first position where said wafer holder and said gas distributor are in a spaced, facing relationship for discharge of the reaction gas onto a wafer substrate and a second position where said wafer holder and said gas distributor are spaced further apart than in said first position;
cleaning means for cleaning said gas dischargers; and
horizontal positioning means for moving said cleaning means between a standby position, located radially intermediate (1) said wafer mounting surfaces and said gas dischargers and (2) said rotary shaft, said standby position being occupied by said cleaning means when said wafer holder and said gas distributor are in said first position, and a working position vertically intermediate one gas discharger and a wafer mounting surface where said cleaning means is in contact with said one gas discharger, said working position being occupied by said cleaning means when said wafer holder and said gas distributor are in said second position.

5,589,002
GAS DISTRIBUTION PLATE FOR SEMICONDUCTOR WAFER PROCESSING APPARATUS WITH MEANS FOR INHIBITING ARCING
Yuh-Jia Su, Cupertino, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.
Filed Mar. 24, 1994, Ser. No. 217,467
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 E **28 Claims**



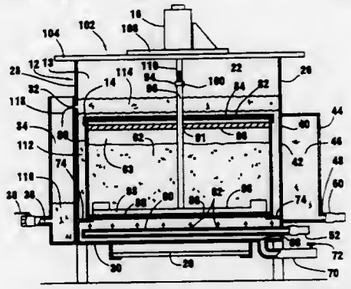
1. A gas distribution plate for a semiconductor processing apparatus which permits the flow of process gas into said processing apparatus while inhibiting arcing adjacent said plate during plasma processing comprising a plurality of non-circular openings in said gas distribution plate, each of said non-circular openings having:
a) a width:
i) smaller than the diameter at which arcing will occur with circular openings; but
ii) at least about 254 μm (10 mils) to inhibit blockage by a halogen-containing plasma; and
b) a length greater than said width.

5,589,003
SHIELDED SUBSTRATE SUPPORT FOR PROCESSING CHAMBER
Jun Zhao, Cupertino; Frank P. Chang, San Jose, and Charles N. Dornfest, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed Feb. 9, 1996, Ser. No. 599,015
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—728 **24 Claims**



24. A processing chamber comprising:
a chamber housing;
a shielded substrate support, housed within the chamber housing, comprising:
a substrate support base having a support surface and a sidewall;
said sidewall of said base having a first effective coefficient of thermal expansion (CTE);
a base shield having a cover plate portion, at least partially covering and supported by the support surface, and a skirt portion adjacent to said sidewall;
the sidewall of said base and the skirt portion of the base shield comprising respective first and second locking surfaces;
said skirt portion of said base shield having a second effective CTE; and
said second CTE being smaller than said first CTE.

5,589,004
METHOD FOR REMEDIATING CONTAMINATED MATERIAL
Brent J. Lashmett, Embarrass; Doug C. Lashmett; H. W. Lashmett, both of Babbitt; Larry R. Herzog, Mt. Iron; Thomas P. Tri, Duluth, and Merideth L. Karpik, Eveleth, all of Minn., assignors to B&S Research, Inc., Embarrass, Minn.
Division of Ser. No. 283,611, Aug. 1, 1994, Pat. No. 5,492,139.
This application May 26, 1995, Ser. No. 450,140
Int. Cl.[6] B08B *7/04;* **C02F** *3/02*
U.S. Cl. 134—10 **12 Claims**



1. A method for removing a contaminating material from a combination material containing said contaminating material and a reusable material, said method comprising:

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placing said combination material in a tank having a cleaning fluid therein capable of separating said contaminating material from said reusable material;

said cleaning fluid containing oxygen consuming microorganisms capable of also consuming at least a portion of said contaminating material;

circulating oxygen through said cleaning fluid so as to provide oxygen for consumption by said microorganisms;

circulating said cleaning fluid around said combination material within said tank whereby said cleaning fluid will cause said contaminating material to separate from said reusable material and will cause at least some portion of said contaminating material to float on the top surface of said cleaning fluid within said tank;

drawing off said contaminating material which is floating on said top surface of said cleaning fluid and removing it from said tank through a skinning opening in said tank;

recirculating said cleaning fluid through said tank through an outlet opening therein which is remote from and lower than the skimming opening.

5,589,005

SYSTEM FOR SUPPLYING ULTRAPURE WATER AND METHOD OF WASHING SUBSTRATE, AND SYSTEM FOR PRODUCING ULTRAPURE WATER AND METHOD OF PRODUCING ULTRAPURE WATER

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome,, Aoba-ku Miyagi-ken Sendai-shi 980, Japan

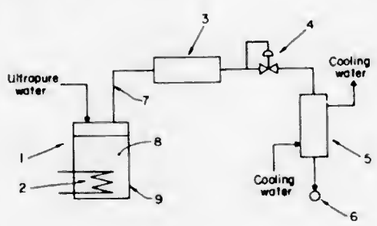
PCT No. PCT/JP92/01450, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994, PCT Pub. No. WO93/08931, PCT Pub. Date May 13, 1993

PCT Filed Nov. 9, 1992, Ser. No. 232,266

Claims priority, application Japan, Nov. 8, 1991, 3-320885

Int. Cl.[6] B08B *3/00;* **C02F** *1/02*

U.S. Cl. 134—30 **23 Claims**



1. A system for supplying ultrapure water comprising:

a source of a first ultrapure water

a piping system connected to said source, said piping system having a use point;

a steam generating means connected to said piping system for heating said first ultrapure water for conversion into a first steam;

a steam heating means connected to said piping system between said steam generating means and said use point for further heating said first steam for conversion thereof into a second steam having a temperature higher than that of said first steam; and

a cooling means connected to said piping system between said steam heating means and said use point for cooling said second steam and for conversion thereof into a second ultrapure water.

5,589,006

SOLAR BATTERY MODULE AND PASSIVE SOLAR SYSTEM USING SAME

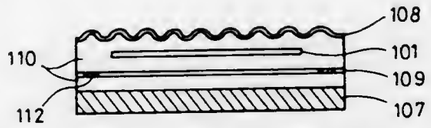
Shigenori Itoyama; Kimitoshi Fukae, both of Nara; Masahiro Mori, Tsuzuki-gun; Yuji Inoue, Nara; Fumitaka Toyomura, Soura-gun, and Takashi Ohtsuka, Tsuzuki-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1994, Ser. No. 348,938

Claims priority, application Japan, Nov. 30, 1993, 5-299819

Int. Cl.[6] H01L *31/058;31/048;* **E04D** *13/18*

U.S. Cl. 136—248 **32 Claims**



17. A passive solar system in which a vent layer is formed between a roof board and a roofing plate provided over the roof board, and in which solar heat absorbed through the roofing plate is converted into a heated air flow, said solar system comprising:

a solar cell module having a solar cell covered with a layer of filler, and an area of a back insulating member larger than that of said solar cell, another layer of said filler, and a back reinforcement member, superposed in this order on the non-light-receiving side of said solar cell, said back insulating member having at least one opening corresponding to at least one pierced portion of said module for accommodating a fixing means affixing said solar cell module to said roof board.

5,589,007

PHOTOVOLTAIC ELEMENTS AND PROCESS AND APPARATUS FOR THEIR FORMATION

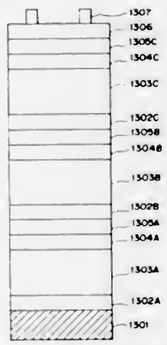
Yasushi Fujioka; Shotaro Okabe, both of Nara; Masahiro Kanai, Soraku-gun; Hideo Tamura; Atsushi Yasuno, both of Nara; Akira Sakai, Soraku-gun, and Tadashi Hori, Tsuzuki-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 187,550, Jan. 28, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,169

Claims priority, application Japan, Jan. 29, 1993, 5-013478; Jan. 29, 1993, 5-013562; Jan. 29, 1993, 5-013563

Int. Cl.[6] H01L *31/075;31/20*

U.S. Cl. 136—249 **21 Claims**



8. A photovoltaic element comprising a first non-monocrystalline silicon-containing semiconductor layer of a first-conductivity type, a first i-type non-monocrystalline silicon-containing semiconductor layer formed by microwave plasma CVD, a second i-type non-monocrystalline silicon-containing semiconductor layer formed by high-frequency plasma CVD, a second non-monocrystalline silicon-containing semiconductor layer of a conductivity type opposite to the first-conductivity type, a third non-monocrystalline silicon-containing semiconductor layer of the first conductivity type, a third i-type non-monocrystalline silicon-containing semiconductor layer formed by microwave plasma CVD, a fourth i-type non-monocrystalline silicon-containing semiconductor layer formed by high-frequency plasma CVD, a fourth non-monocrystalline silicon-containing semiconductor layer of a conductivity type opposite to the first conductivity type, a fifth non-monocrystalline silicon-containing semiconductor layer of the first conductivity type, a fifth i-type non-monocrystalline silicon-containing semiconductor layer formed by microwave plasma CVD, a sixth i-type non-monocrystalline silicon-containing semiconductor layer formed by high-frequency plasma CVD, and a sixth non-monocrystalline silicon-containing semiconductor layer of a conductivity type opposite to the first conductivity type;

said second semiconductor layer, said fourth semiconductor layer and said sixth semiconductor layer, each of opposite conductivity type, being formed by plasma doping.

5,589,008

PHOTOVOLTAIC CELL AND METHOD FOR FABRICATION OF SAID CELL

Herbert Keppner, Neuchatel, Switzerland, assignor to Universite De Neuchatel, Neuchatel, Canada

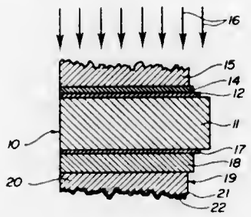
PCT No. PCT/CH94/00192, § 371 Date May 31, 1995, § 102(e) Date May 31, 1995, PCT Pub. No. WO95/10856, PCT Pub. Date Apr. 20, 1995

PCT Filed Sep. 27, 1994, Ser. No. 446,628

Claims priority, application France, Oct. 11, 1993, 93 12246

Int. Cl.[6] H01L *31/06;31/18*

U.S. Cl. 136—259 **30 Claims**



1. A photovoltaic cell, comprising:

a semiconductor substrate having opposed front and rear surfaces;

a front passivation layer deposited on the front surface of the substrate;

an emitter layer formed over the front passivation layer having a first conductivity type (p or n);

a front transparent conductive layer formed over the emitter layer;

a rear passivation layer deposited on the rear surface of the substrate;

a rear layer formed over the rear passivation layer having a second conductivity type (p or n) opposite that of the emitter layer, said rear layer producing a back surface field; and

a reflective element over the rear layer and comprising a rear transparent conductive layer, an adhesion layer formed on the transparent conductive rear layer, and a reflective layer secured to the adhesion layer.

5,589,009

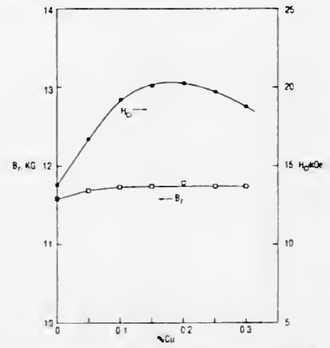
RE-FE-B MAGNETS AND MANUFACTURING METHOD FOR THE SAME

Andrew S. Kim, Pittsburgh, and Floyd E. Camp, Trafford, both of Pa., assignors to Crucible Materials Corporation, Syracuse, N.Y.

Division of Ser. No. 235,279, Apr. 29, 1994, Pat. No. 5,480,471. This application Jun. 5, 1995, Ser. No. 462,959

Int. Cl.[6] H01F *1/053*

U.S. Cl. 148—302 **8 Claims**



1. A permanent magnet alloy consisting essentially of, in weight percent, 27 to 35 of a rare earth element, including Nd in an amount of at least 50 percent of the total rare earth element content; 0.8 to 1.3 B; 0.5 to 5 Co; 40 to 75 Fe; 0.03 to 0.3 C; 0.2 to 0.8 oxygen; and 0.05 to 0.5 of at least one of Cu, Ga, and Ag, with said alloy exhibiting intrinsic coercivity of at least 10 kOe while maintaining substantially the same remanence and energy product compared to said alloy absent said Co and at least one of Cu, Ga, and Ag.

5,589,010

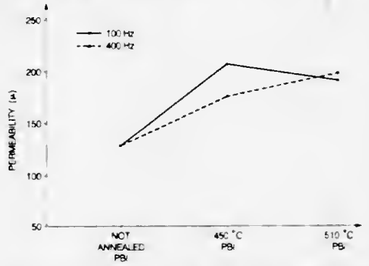
ANNEALED POLYMER-BONDED SOFT MAGNETIC BODY

David E. Gay, Noblesville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 241,069, May 11, 1994, abandoned, which is a division of Ser. No. 44,421, Apr. 9, 1993, abandoned. This application Nov. 24, 1995, Ser. No. 563,436

Int. Cl.[6] H01F *1/22*

U.S. Cl. 148—306 **3 Claims**



1. A compression molded soft magnetic core comprising a coalesced body consisting essentially of a plurality of thermally stress-relieved soft ferromagnetic metal particles consisting essentially of iron which are each substantially surrounded and adhered together by a thermoplastic polymer having a heat deflection temperature of at least about 400° C. and selected from the group consisting of polybenzimidazole and polyimides wherein said polymer constitutes less than about one weight percent of said coalesced body.

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5,589,011

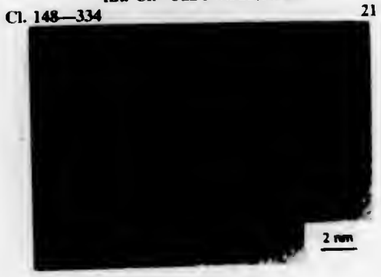
NANOSTRUCTURED STEEL ALLOY

Kenneth E. Gonsalves, Storrs, Conn., assignor to The University of Connecticut, Storrs, Conn.

Filed Feb. 15, 1995, Ser. No. 389,778

Int. Cl.[6] C22C *38/22;38/24*

U.S. Cl. 148—334 **21 Claims**



1. A steel alloy, comprising:

nanostructured crystals comprised of iron, chromium, molybdenum, vanadium and carbon.

5,589,012

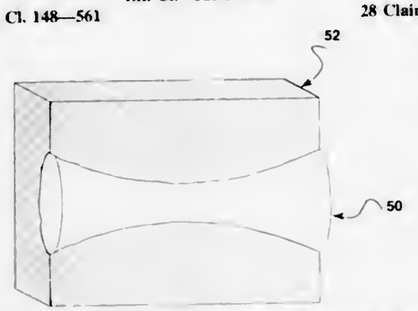
BEARING SYSTEMS

Gray D. Hobby, Stafford, and Bernard A. Riggs, Herndon, both of Va., assignors to Systems Integration and Research, Inc., Arlington, Va.

Filed Feb. 22, 1995, Ser. No. 392,236

Int. Cl.[6] C22C *45/10*

U.S. Cl. 148—561 **28 Claims**



1. A bearing having at least one surface made of an amorphous alloy having a coefficient of friction of less than 0.5, having a crystallization temperature lower than 497° C. and having a tensile strength of 1.0 GPa or greater.

5,589,013

ADHERING CEREMONIAL ROLL

Michael J. Stepanek, Hollis, N.H., assignor to Hampshire Paper Corp., Milford, N.H.

Continuation-in-part of Ser. No. 369,650, Jan. 6, 1995, Pat. No. 5,449,539, which is a continuation-in-part of Ser. No. 144,333, Nov. 1, 1993, Pat. No. 5,401,548, which is a continuation-in-part of Ser. No. 954,027, Sep. 30, 1992, abandoned. This application Jun. 22, 1995, Ser. No. 493,576

Int. Cl.[6] D06N *7/00;* **D04D** *9/00*

U.S. Cl. 156—71 **6 Claims**

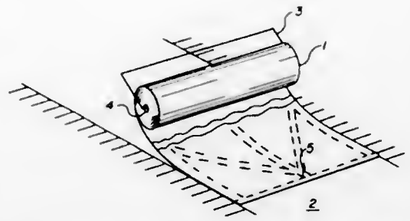
1. A method of applying a removable, ceremonial material to a walkway comprising:

providing a ceremonial roll of non-woven fabric said non-woven fabric comprising long, natural and synthetic fibers, said roll having a length, a starting end, a walking surface adapted to a ceremony, a floor abutting surface and a width between 18 inches and 55 inches, said floor abutting surface having a double-sided, pressure sensitive adhesive attached to the starting end, the adhesive comprising a strip of material having a first side and a second side, each side having an adhesive such that first side of said strip is attached to the floor abutting surface;

securing the starting end of the floor abutting surface to a starting position on the walkway with the adhesive on the second side of the strip;

unrolling the roll along the walkway so as to apply the material to the walkway, the roll resisting removal from the walkway when pulled with a force at an angle between 0 and 30 degrees relative to the walkway, and,

removing the roll from the walkway by pulling the roll at an angle of greater than 30 degrees relative to the walkway.



5,589,014

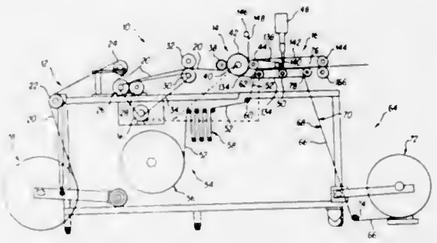
METHOD FOR FORMING PLEATS IN A SHEET-LIKE MATERIAL

Dennis G. Hicks, Neenah, Wis., assignor to Converting, Inc., Clintonville, Wis.

Division of Ser. No. 983,472, Dec. 3, 1992, Pat. No. 5,389,188. This application Jul. 21, 1994, Ser. No. 277,276

Int. Cl.[6] B32B *31/08*

U.S. Cl. 156—73.1 **7 Claims**



1. A method for forming a pleat in a sheet material, comprising the steps of:

feeding a web of sheet material to a pleating surface;

extending at least one pleating tooth carried by the pleating surface into said web, thereby altering the shape of the web to form a pleat;

retracting said pleating tooth from said web after said pleat has been formed;

holding the pleated web against the pleating surface following retraction of said pleating tooth from said web by applying vacuum pressure to said web on both sides of said pleat but not directly below said pleat;

feeding the pleated web from the pleating surface to a bonding device; and

bonding said pleat by operating the bonding device to prevent unraveling of said pleat.

5,589,015

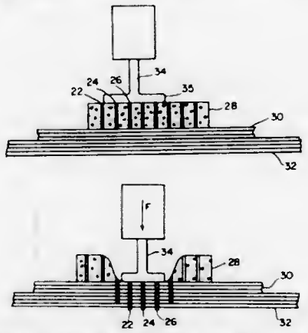
METHOD AND SYSTEM FOR INSERTING REINFORCING ELEMENTS IN A COMPOSITE STRUCTURE

Thomas M. Fusco, Medford; Constance Magee, Wilmington, and Glenn Freitas, Foxboro, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Continuation of Ser. No. 254,987, Jun. 7, 1994, abandoned. This application Feb. 13, 1996, Ser. No. 600,473

Int. Cl.[6] B32B *7/08;31/16*

U.S. Cl. 156—73.1 **13 Claims**



1. A method of inserting reinforcing pins in a composite structure, the method comprising:

inserting a number of reinforcing pins in a compressible material to form a compressible material/pin combination structure;

assembling said compressible material/pin combination structure on a composite structure which includes plies of fibers in a resin matrix;

imparting ultrasonic energy to a plurality of said pins at the same time; and

simultaneously applying pressure to said compressible material and said plurality of pins to compress the compressible material and insert said plurality of pins into the composite structure in unison.

5,589,016

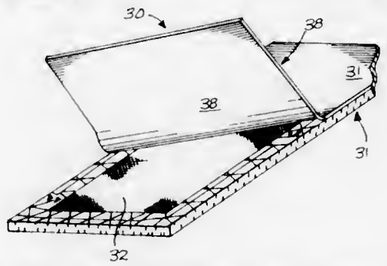
PRESCORED FOAM FOR PANEL FABRICATION

Neil L. Hoopingarner, Everett, and Barry D. Matin, Maple Valley, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 29, 1994, Ser. No. 235,594

Int. Cl.[6] B32B *3/12*

U.S. Cl. 156—87 **21 Claims**



1. A method of fabricating composite panels, comprising:

cutting foam edge pieces from a rigid foam board having a preembossed pattern of surface scores in at least one planar surface thereof, said pattern of surface scores including three series of parallel indentations in said surface of said foam board, each series extending at an angle of 60° to the others;

laying up elements to be bonded together to make a panel, said elements including two face sheets of preimpregnated fabric material, one each covering two opposite planar faces of an interior assembly, said interior assembly having a honeycomb core element in a core of said panel, and a foam edge around said core element, said foam edge made of at least one of said foam edge pieces;

heating said laid-up elements and applying pressure to cure said resin in said preimpregnated sheets and bond said elements together to form said panel;

generating gasses in copious quantities during said curing of said resin and bonding said elements together;

venting said gasses generated within said core of said panel through said pattern of scores in said faces of said foam edge pieces.

5,589,017

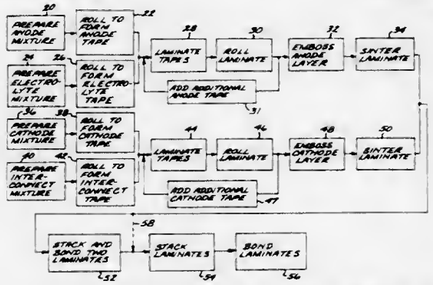
PREPARATION OF A SOLID OXIDE FUEL CELL HAVING THIN ELECTROLYTE AND INTERCONNECT LAYERS

Nguyen Q. Minh, Fountain Valley, Calif., assignor to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 11,052, Jan. 29, 1993, Pat. No. 5,368,667. This application Sep. 7, 1994, Ser. No. 301,930

Int. Cl.[6] C04B *37/00*

U.S. Cl. 156—87 **12 Claims**



1. A method of preparing a fuel cell, comprising the steps of:

preparing a first unfired ceramic tape comprising an anode material;

preparing a second unfired ceramic tape comprising an electrolyte material, the second ceramic tape being thinner than the first ceramic tape;

laminating the first ceramic tape and the second ceramic tape together to form an unfired anode/electrolyte laminate;

preparing a third unfired ceramic tape comprising a cathode material;

preparing a fourth unfired ceramic tape comprising an interconnect material, the fourth ceramic tape being thinner than the third ceramic tape;

laminating the fourth ceramic tape and the third ceramic tape together to form an unfired cathode/interconnect laminate;

stacking the unfired anode/electrolyte laminate and the unfired cathode/interconnect laminate such that the second unfired ceramic tape is adjacent to the third unfired ceramic tape; and

fabricating the unfired anode/electrolyte laminate and the unfired cathode/interconnect laminate into a fuel cell.

5,589,018

GLASS REPAIR KIT AND METHOD OF USE

Richard A. Campfield, 9249 Loquat Dr., Riverside, Calif. 92508

Continuation of Ser. No. 155,452, Nov. 19, 1993, Pat. No. 5,425,827, which is a continuation-in-part of Ser. No. 881,625, May 12, 1992, Pat. No. 5,429,692, which is a continuation-in-part of Ser. No. 580,075, Sep. 10, 1990, Pat. No. 5,116,441. This application May 8, 1995, Ser. No. 436,591

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—94 **20 Claims**

1. A kit for assembly of glass repair tools comprising:

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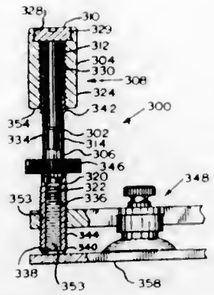
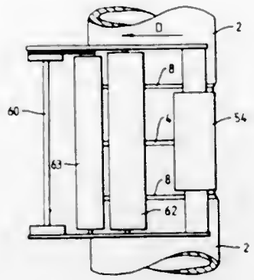




a first bar of predetermined length having a first end, a second end, and a middle;

a second bar of predetermined length having a first end, a second end, and a middle;

means for connecting said first bar and said second bar substantially at a right angle to each other;

a resin injector;

means for attaching said resin injector to said first end of said first bar, adjustably for greater or lesser projection from said first bar;

a first suction cup and a second suction cup;

means for attaching said first suction cup to said first end of said second bar

means for attaching said second suction cup to said second end of said second bar, said first and second suction cups being aligned when so attached;

a pressure bolt;

means for attaching said pressure bolt to said second end of said first bar adjustably for greater or lesser projection from said first bar;

means for attaching said pressure bolt to said middle of said second end bar adjustably for greater or lesser projection from said second bar;

means for attaching a suction cup to said middle of said first bar;

whereby the following tools may be assembled (1) a repair bridge in which said first and second bars are attached at their middles, the resin injector is adjustably attached at the first end of the first bar and the pressure bolt is adjustably attached at the second end of the first bar and suction cups are attached at the first and second end of the second bar, respectively and (2) a crack opener in which said suction cups are attached to said first and second ends of said second bar and said pressure bolt is adjustably attached to the middle of said second bar and (3) a repair bar tool in which said resin injector is adjustably attached to said first end of said first bar and said pressure bolt is adjustably attached to said second end of said first bar and a suction cup is attached to said middle of said first bar.

5,589,019

METHOD FOR APPLYING COVERING MATERIAL TO AN ELONGATE SUBSTRATE

Jozef Van Beersel, Temse, Belgium, and Robin C. John, Bath, United Kingdom, assignors to NV Raychem SA, Kessel-Lo, Belgium

PCT No. PCT/GB93/00487, § 371 Date Oct. 4, 1994, § 102(e) Date Oct. 4, 1994, PCT Pub. No. WO93/17857, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 9, 1993, Ser. No. 295,896

Claims priority, application United Kingdom, Mar. 9, 1992, 9205073; Oct. 30, 1992, 9222797

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—184 **2 Claims**

1. A method of applying a wrapped covering material around a welded joint between two coated metal pipes bared of coating in the region of the weld, said method comprising:

(a) positioning an apparatus comprising

i) a hollow frame which can be positioned around the joint, and which is mounted on two or more wheels or rollers that, in use, can be rolled around the joint causing the frame to rotate around the joint in a circumferential manner;

ii) a covering material delivery device mounted on the frame, for receiving a wraparound covering material coated with an adhesive having a tack temperature and for delivering the adhesive-coated covering material onto a surface of the joint as the frame is rotated;

iii) at least two pressure rollers which are arranged to press radially inward onto the delivered covering material as the frame is rotated, one roller being arranged to press against the weld region and the other roller acting on the transition between the pipe coating; and

iv) a heater for heating the adhesive-coated covering material before it contacts the pressure rollers,

said positioning being such that the frame surrounds the joint and the rollers;

(b) mounting the adhesive-coated covering material in the delivery device;

(c) preheating the joint to 130° to 170° C.;

(d) preheating the adhesive-coated covering material to about the tack temperature of the adhesive with the heater; and

(e) rotating the frame circumferentially relative to the joint thereby delivering the covering material and causing the pressure rollers to press radially downward so that the roller pressing against the weld exerts a different pressure than the roller pressing against a transition between the pipe coating and the bared pipe.

5,589,020

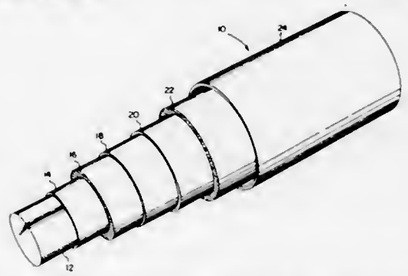
APPARATUS FOR INSULATING CRYOGENIC DEVICES

Alexander P. Varghese, Bethlehem, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 51,503, Apr. 21, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,343

Int. Cl.[6] B31C *13/00*

U.S. Cl. 156—185 **4 Claims**



1. A method of insulating a cryogenic device without directly applying insulation to the device comprising the steps of:

providing a sleeve having a generally circular cross-section and a longitudinal axis fabricated from a material having low thermal emissivities, the sleeve having a diameter larger than the device to be insulated;

positioning said sleeve for rotation about said longitudinal axis;

rotating said sleeve and wrapping said sleeve with the desired thickness of thermal insulating material; and

installing said device inside said sleeve after insulation of said sleeve is completed.

5,589,021

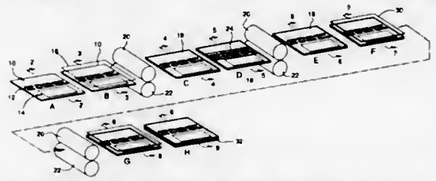
METHOD OF PRODUCING A SIGN

Hanley D. Bloom, Van Nuys, Calif., assignor to Colorprinting Specialists, Inc., North Hollywood, Calif.

Continuation-in-part of Ser. No. 47,915, Apr. 19, 1993, Pat. No. 5,399,217. This application Mar. 21, 1995, Ser. No. 407,614

Int. Cl.[6] B32B *31/12*

U.S. Cl. 156—219 **8 Claims**



1. A method of producing a sign having raised colored characters in a predetermined design comprising:

providing a generally planar male die presenting the predetermined design;

positioning a substrate layer against the male die;

providing a heatable pressure surface that is devoid of the predetermined design;

applying heat and pressure to the substrate layer utilizing the pressure surface to press the layer against the male die and emboss the predetermined design of the male die into the substrate layer as raised areas on the substrate layer;

applying color to the raised areas with the substrate layer positioned on the male die; and

separating the embossed and colored substrate layer from the male die.

5,589,022

METHOD OF MANUFACTURING EMBLEM OF THERMOPLASTIC SYNTHETIC RESIN SHEET

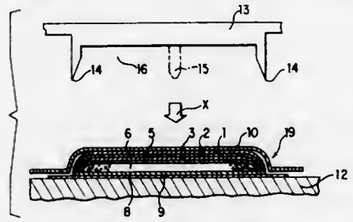
Eiji Kuwahara, Omiya Mansion, No. 25-18, Nakamiya 2-chome, Asahi-ku, Osaka-shi, Osaka-fu, Japan

Filed Jun. 5, 1995, Ser. No. 465,106

Claims priority, application Japan, Feb. 6, 1995, 7-039445

Int. Cl.[6] B32B *3/02;15/08*

U.S. Cl. 156—231 **12 Claims**



1. A method of manufacturing an emblem comprising steps of:

arranging a composite sheet on a pole plate of an electrode die for high frequency induction, said composite sheet comprising a pattern sheet, a back-up layer of thermoplastic synthetic resin arranged under the pattern sheet, a tacky adhesion layer arranged under said pattern sheet, a releasing paper sheet arranged under said tacky adhesion layer and a highly heat-resistant transparent carrier film, said pattern sheet comprising a transparent polyurethane film, a metal vapor deposition film formed under a lower surface of said transparent polyurethane film and a polyurethane film arranged under a lower surface of said metal vapor deposition film to cover said metal vapor deposition film;

pressing and heating said composite sheet from above by means of an engraving die to fusion-cut said pattern sheet and said back-up layer between said carrier film and said releasing paper sheet at least along the outer boundary off the pattern and weld them together;

peeling off either said carrier film or said releasing paper sheet;

removing an unnecessary areas of the pattern; and

bonding the peeled off carrier film or releasing paper sheet again.

5,589,023

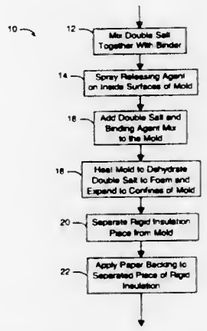
METHOD FOR MAKING AND SHAPING OBJECTS OF RIGID INSULATION

John S. Rendall, and Massoud Ahghar, both of Albuquerque, N.M., assignors to Solv-Ex Corporation, Albuquerque, N.M.

Continuation-in-part of Ser. No. 183,477, Nov. 8, 1994, abandoned. This application Apr. 26, 1995, Ser. No. 429,195

Int. Cl.[6] B29C *67/20*

U.S. Cl. 156—245 **9 Claims**



1. A method for making panels and other shapes of rigid insulation, comprising the steps of:

mixing a double salt of aluminum potassium sulphate in powder form of $Al_2K_2(SO_4)_4\ 24H_2O$ and a binding agent also in powder form;

spraying a mold-releasing agent to cover the inside surfaces of a mold that defines a final shape for said panels and other shapes of rigid insulation;

adding said mix of said double salt of aluminum potassium sulphate and said binding agent to said mold;

heating said mold and said mix for dehydration of said double salt of aluminum potassium sulphate in multiple steps of approximately 50° C., wherein said mix foams and expands to fill said inside surfaces of said mold;

separating a rigid state of said expanded foam of said dehydrated double salt of aluminum potassium sulphate and binding agent from said mold; and

applying a protective paper covering to exposed surfaces of said expanded foam of said dehydrated double salt of aluminum potassium sulphate and binding agent forming a piece of rigid insulation.

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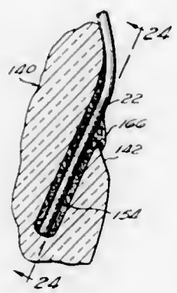
5,589,024

FABRICATION OF AN INTRAOCULAR LENS

Larry W. Blake, Irvine, Calif., assignor to Pharmacia Iovision, Inc., Irvine, Calif.

Division of Ser. No. 900,053, Jun. 27, 1992, which is a division of Ser. No. 705,771, May 28, 1991, Pat. No. 5,185,107, which is a division of Ser. No. 262,985, Oct. 26, 1988, Pat. No. 5,104,590. This application Jun. 5, 1995, Ser. No. 464,217
Int. Cl.[6] B32B *31/12*; B29D *11/00*
U.S. Cl. 156—245 4 Claims



1. A method of incorporating a haptic into an intraocular lens comprising the steps of

surface charging an end of said haptic so as to improve the adhesive properties thereof;

coating said surface charged end with a primer; and

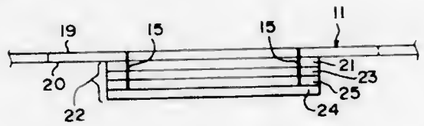
bonding said haptic to said intraocular lens, wherein said primer-coated end of said haptic is dusted with fumed silicon dioxide prior to said bonding step.

5,589,025

I D CARD INTERMEDIATE AND METHOD

Ronald R. Garrison, Batavia, Ill., assignor to Wallace Computer Services, Inc., Lisle, Ill.

Continuation of Ser. No. 159,294, Nov. 30, 1993, abandoned. This application Aug. 9, 1995, Ser. No. 512,988
Int. Cl.[6] B32B *31/18*; B92D *15/00*
U.S. Cl. 156—268 3 Claims



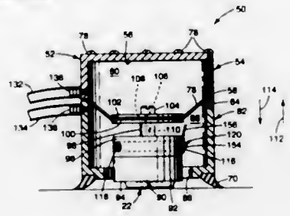
1. A method for making an I D card intermediate comprising performing at a first site the steps of providing a two ply film laminate arranged in face-to-face relation with a dry, rupturable adhesive therebetween, providing a length of paper having top and bottom surfaces with first printed indicia relating to an I D card sponsor on said top surface, adhesively uniting said laminate to said bottom surface to position a first of said film plies adjacent said bottom surface, diecutting said paper length and said first of said film plies to provide a generally rectangular closed perimeter cut defining an I D card having said first film ply attached thereto with said film laminate extending beyond said diecut on all sides thereof, performing at a second site the step of laser imprinting second indicia on said top surface relating to the identity of the intended user of said I D card with both said first and second indicia being within said diecut and removing said I D card and said first film by rupturing said dry adhesive.

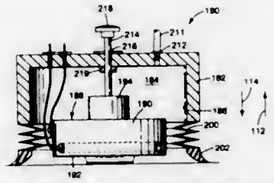
5,589,026

METHOD AND APPARATUS FOR ADHERING OBJECT TO A GLASS SURFACE

Jack L. Perecman, Golden Valley, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1995, Ser. No. 460,181
Int. Cl.[6] B32B *31/20*
U.S. Cl. 156—286 17 Claims





1. A method for adhering an object having a heat activatable adhesive layer to a glass surface, comprising the steps of:

(a) positioning the heat activatable layer of the object adjacent the glass surface;

(b) enclosing the object in a sealed space after step (a);

(c) at least partially evacuating the sealed space about the object after step (b) to remove trapped air bubbles between the glass surface and the object;

(d) heating the heat activatable adhesive to adhere the object to the glass surface;

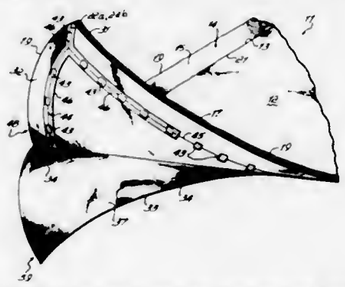
(e) applying a force using a platen assembly having a contact surface conforming to the shape of the object to the adhesive layer to facilitate the adherence of the object to the glass surface, whereby the platen assembly is resiliently urged against the object by further evacuating the sealed space.

5,589,027

CUSTOM FABRICATED AND BORDERED RUG AND METHOD AND APPARATUS FOR FORMING IT

John Thornton, Chattanooga, Tenn.; Stanton J. Pool, Dalton, Ga., and Dennis R. Doll, Harrison, Tenn., assignors to American Rug Craftsmen, Inc., Sugar Valley, Ga.

Division of Ser. No. 30,631, Mar. 12, 1993, abandoned. This application Feb. 22, 1994, Ser. No. 199,057
Int. Cl.[6] B29C *65/00*
U.S. Cl. 156—304.4 12 Claims



1. A method of forming a composite bordered rug comprising:

bonding a plurality of border carpet segments to an edge of a central field carpet segment, each of said border carpet segments and said field segments comprising an upper surface and a carpet backing;

wherein said border carpet segments are bonded to said edge of said field carpet segment by abutting edges of said border carpet segments to said edge of said field carpet segment and applying a first hot-melt adhesive on said carpet backing of adjoining border carpet segments and said field carpet segment;

allowing said first hot-melt adhesive to solidify to form a bordered rug;

adhering a unitary carpet backing to a back side of said bordered rug wherein said carpet backing covers said border carpet segments and said field carpet segment by applying a layer of a second hot-melt adhesive between said back side of said bordered rug and said carpet backing and pressing said carpet backing against said back side of said bordered rug by passing the entire bordered rug between parallel moving runs of two endless belts and pressing said runs toward one another and heating said carpet backing as it passes between said runs, thereby forcing said carpet backing against the back side of said bordered rug and heating said layer of said second hot-melt adhesive as said bordered rug and said carpet backing move within said endless belts, thereby causing said hot-melt adhesive to adhere to said carpet backing and said back side of said bordered rug to form said composite bordered rug.

5,589,028

BONDING METHOD EMPLOYING TIE LAYERS FOR ADHERING POLYETHYLENE TO FLUOROPOLYMERS

Donald N. Robinson, Collegeville, and John H. Peltz, Glenolden, both of Pa., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 334,184, Nov. 3, 1994, abandoned. This application May 30, 1995, Ser. No. 453,796
Int. Cl.[6] C09J *5/10*
U.S. Cl. 156—306.6 5 Claims

1. A method of laminating a sheet of polyethylene to a sheet of a fluoropolymer resin comprising the steps of:

blending a mixture consisting essentially of

(a) 60–70% by weight of an aliphatic thermoplastic polyester-based polyurethane;

(b) 20–35% by weight of a copolymer selected from

(1) the copolymers of ethylene, vinyl acetate and maleic anhydride and

(2) graft copolymers of polyethylene and maleic anhydride; and

(c) 0–20% by weight of a homopolymer selected from low density polyethylene and low molecular weight polyvinylidene fluoride,

at a temperature between 125°–150° C. to form a molten polymer mixture;

compression molding the molten mixture at a temperature between 150°–177° C. to form a tie layer sheet having a thickness of 8–10 mil;

disposing the tie layer sheet between a sheet of polyethylene; and a sheet of PVDF or PVDF-fluoromonomer copolymer to form a composite; and

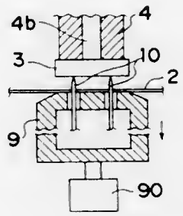
compression molding said composite at a temperature between 232° C. and 246° C. and under pressure sufficient to bond the sheet of polyethylene to the sheet of PVDF or PVDF-fluoromonomer copolymer.

5,589,029

SEMICONDUCTOR CHIP-SUPPLY METHOD AND APPARATUS

Hisako Matsui, Neyagawa, and Akira Kabeshita, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

Filed Jul. 20, 1995, Ser. No. 504,748
Claims priority, application Japan, Jul. 21, 1994, 6-169447
Int. Cl.[6] B32B *35/00*
U.S. Cl. 156—344 11 Claims



1. A semiconductor chip-supply apparatus, comprising:

a sucking member disposed below an adhesive sheet and having a suction face for sucking a lower face of the adhesive sheet thereto and holding the adhesive sheet thereon, a semiconductor chip being bonded to an upper face of the adhesive sheet with the adhesive sheet being positioned below the semiconductor chip;

a push-up needle that has a tip thereof positioned adjacent to the lower face of the adhesive sheet;

a driving means for moving said sucking member and the adhesive sheet that is sucked to and held by said sucking member downward relative to said push-up needle so as to cause relative upward movement of said push-up needle with respect to said sucking member and the adhesive sheet such that said push-up needle can carry out a push-up operation while said sucking member sucks the adhesive sheet thereto; and

a sucking collet for sucking and transporting the semiconductor chip separated from the adhesive sheet by the pushup operation of said push-up needle.

5,589,030

METHOD FOR PREPARING VANILLIN FROM OLD NEWSPRINT

Walter E. Sande, and Karl D. Sears, both of Shelton, Wash., assignors to Rhone-Poulenc Inc., Cranbury, N.J.

Filed Dec. 7, 1994, Ser. No. 350,835
Int. Cl.[6] D21C *5/02*
U.S. Cl. 162—7 9 Claims

1. A method for preparing vanillin from old newsprint comprising the steps of:

a) converting old newsprint to a crumb pulp comprising of from about 20% to about 50% crumb pulp fiber solids by weight on an oven dry basis and the remainder water;

b) cooking the crumb pulp in a medium comprising crumb pulp and cooking acid solution selected from the group consisting of sodium bisulfite, magnesium bisulfite, ammonium bisulfite, calcium bisulfite or mixtures thereof wherein the weight ratio of cooking acid solution to the crumb pulp fiber is from about 3 to about 6 for sufficient time and at sufficient temperature and pressure to form a spent sulfite liquor containing lignosulfonates;

c) separating the cooked crumb pulp fiber from the spent sulfite liquor;

d) removing the lignosulfonates from the spent sulfite liquor; and

e) preparing vanillin from the removed lignosulfonates.

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5,589,031

CHLORINE DIOXIDE BLEACHING OF CHEMICAL PULP

Per-Åke Färnstrand; Lars T. Sjödin, both of Sundsvall; Lars-Åke Lindström, Alnö, and K. Solveig E. Nordén, Njurunda, all of Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sweden

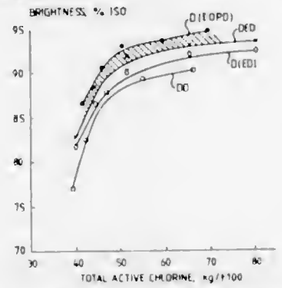
PCT No. PCT/SE91/00178, § 371 Date Oct. 2, 1992, § 102(e) Date Oct. 2, 1992, PCT Pub. No. WO91/17306, PCT Pub. Date Nov. 14, 1991

PCT Filed Mar. 7, 1991, Ser. No. 930,665

Claims priority, application Sweden, Apr. 30, 1990, 9001548

Int. Cl.[6] D21C *9/14;9/147;9/16*

U.S. Cl. 162—65 **8 Claims**



1. A method of bleaching chemical pulp comprising: subjecting a partially bleached chemical pulp to a final bleaching sequence which includes bleaching said partially bleached chemical pulp in a first chlorine dioxide bleaching step so as to produce a first chlorine dioxide bleached pulp, washing said first chlorine dioxide bleached pulp so as to produce a washed pulp, extracting said washed pulp with an alkali in an amount of between about 4 and 10 kg/ton of said pulp so as to produce an alkali extracted pulp including residual alkali therein, oxidizing said alkali extracted pulp by admixing an oxidizing agent selected from the group consisting of oxygen gas and hydrogen peroxide with said alkali extracted pulp so as to produce an oxidized pulp, addin an acid to said oxidized pulp in order to terminate said oxidizing step and to lower the pH of said oxidized pulp, without affecting a complete neutralization of said residual alkali therein by adding an amount of said acid to said oxidized pulp such that H^+ (kmol H^+/ton of pulp)=(X−2)/40 wherein X is the amount of said alkali added during said extracting step expressed in kilograms of said alkali per ton of said pulp so as to produce an acid neutralized pulp, and further bleaching said acid neutralized pulp in a second chlorine dioxide bleaching step.

5,589,032

PROCESS FOR PREPARING A BLEACHING LIQUOR CONTAINING PERCARBOXYLIC ACID AND CARO'S ACID

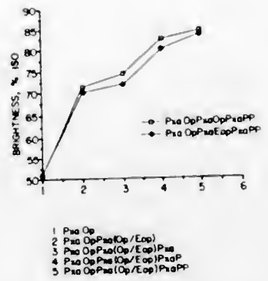
Hou-Min Chang; Hasan Jameel; Junfu Song, all of Raleigh, N.C.; Dingru Pan, Beihing, China; Bijan Amini, Moorestown, N.J.; John R. Webster, Wilmington, and Bruce A. Evans, Hockessin, both of Del., assignors to North Carolina State University, Raleigh, N.C., and E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 948,122, Sep. 21, 1992, abandoned. This application Sep. 17, 1993, Ser. No. 123,532

Int. Cl.[6] D21C *9/16*

U.S. Cl. 162—76 **4 Claims**

1. A process for preparing a bleaching liquor containing a mixture of percarboxylic acid and Caro's acid which comprises mixing a carboxylic acid of the formula RCO_2H wherein R is an alkyl group of from 1 to 5 carbon atoms with an equilibrium solution of Caro's acid containing an initial amount of hydrogen peroxide and sulfuric acid wherein the mole ratio of carboxylic acid to the initial amount of hydrogen peroxide is maintained in the



range of from 0.3 to 1.5 and the mole ratio of sulfuric acid to the initial amount of hydrogen peroxide is maintained in the range of from 0.4 to 3.0, and wherein the concentration of H_2O_2 is sufficient to permit the overall conversion of H_2O_2 of approximately 60–90%.

5,589,033

PRODUCTION OF PREHYDROLYZED PULP

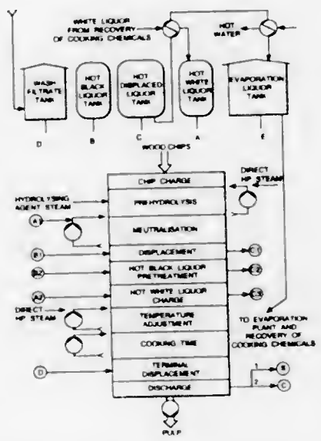
Panu Tikka, and Kari Kovasin, both of Rauma, Finland, assignors to Sunds Defibrator Pori OY, Finland

Filed May 13, 1994, Ser. No. 242,617

Claims priority, application Finland, Jan. 24, 1994, 940332

Int. Cl.[6] D21C *1/06;3/02*

U.S. Cl. 162—84 **28 Claims**



1. A batch process for the preparation of pulp from lignin-containing cellulosic material comprising prehydrolyzing said cellulosic material in a reactor so as to produce prehydrolyzed cellulosic material and hydrolysate, neutralizing said hydrolysate and said prehydrolyzed cellulosic material in said reactor with alkaline neutralizing liquor containing sodium hydroxide and sodium sulfide so as to produce neutralized hydrolysate and neutralized prehydrolyzed cellulosic material and so as to dissolve hemicellulose contained in said cellulosic material, removing said neutralized hydrolysate from said reactor as a separate stream essentially comprising only said neutralized hydrolysate, and delignifying said neutralized prehydrolyzed cellulosic material with alkaline cooking liquor containing sodium sulfide and sodium hydroxide.

5,589,034

POLYMER-REINFORCED PAPER HAVING IMPROVED CROSS-DIRECTION TEAR

David P. Hultman, Munising; Donald D. Watson, Christmas, and Edward W. Heribacka, Munising, all of Mich., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 167,746, Dec. 16, 1993, abandoned. This application May 31, 1995, Ser. No. 455,585

Int. Cl.[6] D21H *21/18*

U.S. Cl. 162—111 **18 Claims**

1. A polymer-reinforced paper comprising:

fibers, at least about 50 percent of which on a dry weight basis are cellulosic fibers;

a latex reinforcing polymer in an amount sufficient to provide the paper with from about 10 to about 70 percent, by weight, of reinforcing polymer, based on the dry weight of the paper; and

from about 15 to about 70 percent by weight, based on the dry weight of the cellulosic fibers, of a polyethylene glycol having a molecular weight of from about 100 to about 1,500;

wherein, when the paper has a moisture content less than about 5 percent by weight, the polymer-reinforced paper has an average cross-direction tear as measured with an Elmendorf Tear Tester in accordance with TAPPI Method T414 which is from about 10 to about 100 percent higher than the cross-direction tear of an otherwise identical polymer-reinforced paper which lacks the polyethylene glycol.

5,589,035

LIQUID TREATMENT DEVICE

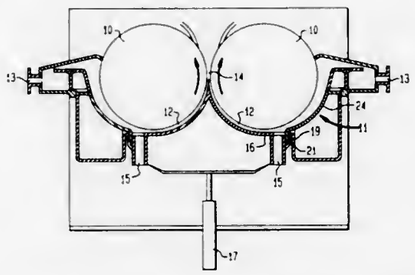
Ingemar Sundqvist, Bergeforsen, Sweden, assignor to Sunds Defibrator Industries AB, Sweden

Filed Aug. 26, 1994, Ser. No. 296,707

Claims priority, application Sweden, Sep. 8, 1993, 9302898

Int. Cl.[6] B30B *3/02*

U.S. Cl. 162—232 **3 Claims**



1. Apparatus for liquid treatment and dewatering of material suspensions comprising a vat, first and second rotatably mounted cylindrical liquid permeable press rolls juxtaposed with each other to form a nip therebetween and at least partially enclosed within said vat, said vat including a bottom portion defining a converging space in the direction towards said nip between said first and second press rolls, whereby said vat is divided between said bottom portion of said vat and a remaining portion of said vat, wherein said bottom portion of said vat includes treatment liquid inlets which form a part of said bottom portion and wherein said bottom portion is openable so as to provide access to said vat, and sealing means for providing a liquid seal between said bottom portion of said vat and said remaining portion of said vat, said sealing means comprising a shoulder extending about said remaining portion of said vat and extending towards said bottom portion of said vat, and bar means in sealable communication with said shoulder an adjustably extending about said bottom portion of said vat and extending towards said remaining portion of said vat, said bar means being connected to said treatment fluid inlets and said bar means being adjustable whereby the position of said bottom portion of said vat, and said converging space, is determined thereby.

5,589,036

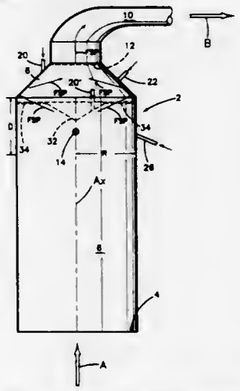
CONTROLLING PULP FLOW IN AN UPFLOW PULP TREATMENT TOWER

John A. Fleck, West Chester, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 884,947, May 18, 1992, abandoned. This application Sep. 2, 1993, Ser. No. 115,110

Int. Cl.[6] D21C *7/06*

U.S. Cl. 162—246 **1 Claim**



1. A method for controlling movement of pulp stock in an upflow cylindrical pulp treatment tower, said method comprising the steps of:

(a) injecting jets of a diluent fluid into said tower through a side wall thereof, said jets moving along flow paths which vary from tangential of said tower in one or more first jets, to radial of said tower in one or more second jets;

(b) vectoring pulp flow streams resulting from said diluent jets with said tower toward a restricted discharge zone from said tower, which the discharge zone has a smaller area than the cross-sectional area of said tower wherein said pulp flow streams are initially converged toward the tower axis, subsequently deflected toward the tower circumference and reconverged toward the tower axis after said subsequent deflection step; and

(c) discharging said vectored pulp flow stream from said tower.

5,589,037

METHOD FOR REMOVING TETRANITROMETHANE FROM NITRIC ACID

Thomas L. Guggenheim, Mt. Vernon, Ind.; Sharon M. Fukuyama, Parkersburg, W. Va., and Gregory L. Warner, Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 24, 1995, Ser. No. 547,516

Int. Cl.[6] B01D *3/34*

U.S. Cl. 203—35 **15 Claims**

1. A process for removing tetranitromethane from a tetranitromethane-contaminated concentrated nitric acid stream otherwise containing less than 5 percent by weight of organic compounds, comprising the steps of:

(A) adding concentrated sulfuric acid containing less than 5 percent by weight of organic compounds to said nitric acid stream to form a mixed acid stream that contains tetranitromethane, wherein the amount of sulfuric acid added is effective to render the tetranitromethane capable of removal

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from the mixed acid stream by sparging the mixture with air or with an inert gas, and

(B) separating the tetranitromethane from the mixed acid stream.

5,589,038

MAGNETIC SUBSTANCE

Masafumi Ata, Kanagawa; Masataka Machida, Tokyo, and Haruo Watanabe, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 939,723, Sep. 2, 1992, abandoned. This application Nov. 13, 1995, Ser. No. 556,641

Claims priority, application Japan, Sep. 5, 1991, 3-254759; Oct. 31, 1991, 3-286353; Dec. 4, 1991, 3-320722

Int. Cl.[6] C04B *35/00*

U.S. Cl. 204—157.42 **4 Claims**

3. A method for making a magnetic recording medium comprising the steps of:

providing a dispersion of an organic polymer, an unsubstituted fullerene having the formula C_n, wherein n is an integer selected from 60, 70, 76 and 84 and a halogen or hydrogen-introducing agent wherein said halogen introducing agent is a halogen-containing salt;

ultrasonically irradiating said dispersion in a sealed container; and

maintaining the irradiated dispersion in said container until a magnetic recording medium comprising a matrix of a non-conductive material and a magnetized substituted fullerene having a ground state spin multiplicity in a doublet state is obtained.

5,589,039

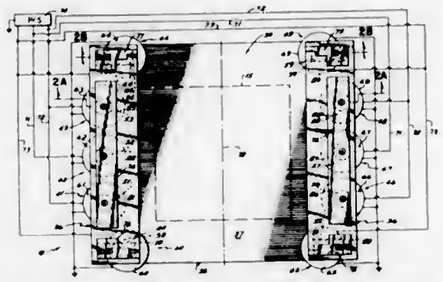
IN-PLANE PARALLEL BIAS MAGNETIC FIELD GENERATOR FOR SPUTTER COATING MAGNETIC MATERIALS ONTO SUBSTRATES

Jon S. Hsu, Taipei, Taiwan, assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Jul. 28, 1995, Ser. No. 508,865

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.12 **15 Claims**



1. A sputter coating apparatus having a biasing magnet for magnetically aligning domains in a thin film of material in the deposition thereof onto a substrate, comprising:

a substrate support having a substrate support surface thereon lying in a plane;

a central magnet having a pair of poles spaced a distance apart and located approximately in the plane at opposite ends of the substrate support surface;

a pair of side magnets of approximately equal strength equally spaced on opposite sides of the support surface, each side magnet having a pair of corner poles spaced less than said distance from each other, the pairs of corner poles being approximately equally spaced from the poles of the central magnet on opposite sides thereof;

a pair of adjustable intermediate magnets of approximately equal strength positioned between the central and side magnets, the intermediate magnets each having a pair of poles spaced from each other on opposite ends of the support surface defining a gap therebetween;

the central, intermediate and side magnets having generally parallel polar axes, the poles of each magnet being magnetically interconnected by core material located generally outside of the plane; and

the magnets having strengths such that the resultant field therefrom is parallel to within approximately one degree on a substrate when supported in the plane on the substrate support surface.

5,589,040

PROCESS FOR PRODUCING OPTICAL RECORDING MEDIUM SPUTTERING METHOD AND SPUTTERING TARGET

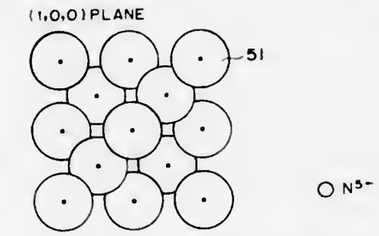
Naoki Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 131,734, Oct. 5, 1993, abandoned. This application Dec. 20, 1995, Ser. No. 580,047

Claims priority, application Japan, Oct. 5, 1992, 4-288187; Aug. 26, 1993, 5-211613

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.26 **16 Claims**



1. A process for producing an optical recording medium comprising on a substrate an optical recording film and inorganic dielectric film containing a metalloid element, comprising:

an optical recording film-forming step of forming the optical recording film on the substrate, and

an inorganic dielectric film-forming step of subjecting at least one sputtering target comprising a crystal of the metalloid element to DC sputtering in a reactive gas atmosphere to form an inorganic dielectric film,

wherein said crystal of the metalloid element has a diamond crystal structure, and

the sputtering target is so constituted to have a sputtering surface substantially conforming to a lattice plane represented by Miller indices (1,0,0) of the diamond crystal structure.

5,589,041

PLASMA SPUTTER ETCHING SYSTEM WITH REDUCED PARTICLE CONTAMINATION

Alexander D. Lantsman, Middletown, N.Y., assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corp., Orangeburg, N.Y.

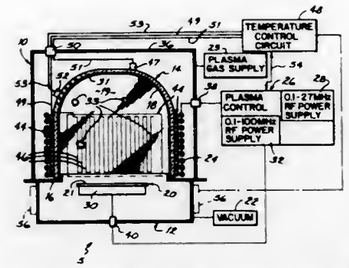
Filed Jun. 7, 1995, Ser. No. 488,060

Int. Cl.[6] C23C *14/54*

U.S. Cl. 204—192.33 **22 Claims**

1. A plasma processing system for plasma sputter etching a substrate with reduced particle contamination comprising:

a plasma processing chamber having an interior surface to define a processing space therein to contain a substrate to be sputter etched and including a vacuum system for creating a vacuum environment in said processing space;



an electrical element coupled to the plasma processing chamber for coupling electrical energy into at least a portion of the processing space through the interior surface for generating a plasma therein to etch the substrate which thereby produces a temperature rise in the processing chamber interior surface up to a processing temperature, the element being operable for interrupting the electrical energy to the processing space so that the plasma is extinguished when the plasma processing is complete;

a heating device coupled to the plasma processing chamber externally of the vacuum processing space and operable for controllably heating the processing chamber interior surface;

a temperature control circuit connected to the heating device to control the operation and temperature of the heating device, the temperature control circuit turning the heating device to an ON state and operating the heating device for heating the processing chamber interior surface to approximately said processing temperature approximately at the time when the electrical element is interrupting energy to the processing chamber and the plasma is being extinguished, the temperature of the chamber interior space, after plasma generation, being maintained by the temperature control circuit approximately at the processing temperature of the processing chamber interior space during plasma generation, such that the chamber interior surface is maintained at a relatively constant temperature during plasma processing and for a predetermined time before and thereafter to prevent the flaking of deposited sputtered material from the processing chamber interior surface and the generation of contamination particles within the processing space;

whereby contamination of the sputter etched substrate is reduced.

5,589,042

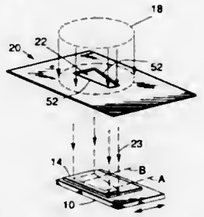
SYSTEM AND METHOD FOR FABRICATION OF PRECISION OPTICAL RAMP FILTERS

Klaus Robinson, Woodland Hills, and Hugh L. Garvin, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 8, 1994, Ser. No. 336,592

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.34 **8 Claims**



1. A system for fabricating precision optical ramp filters, each of said filters having optical transmission and reflectance coefficients that vary as a function of position on said filter, comprising:

a substrate which is optically transparent over a wavelength range of said optical ramp filter,

reflective material of a predetermined thickness disposed on said substrate, said reflective material having optical transmission and reflectance coefficients that vary with its thickness,

an etching beam generator for generating a shaped etching beam whose width varies along its length, and

a translator for imparting a relative translation between said beam and said substrate, with different portions of said reflective material exposed to different respective beam widths so that the thickness of said reflective material after etching varies as a function of position, with a corresponding positional variation in the reflective material's optical transmittance and reflectance.

5,589,043

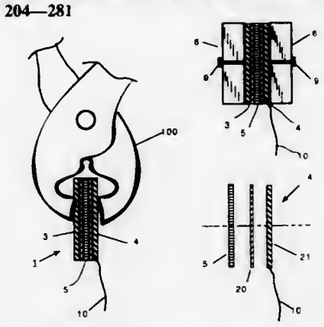
MASK FOR PLATING METALS AND METHOD OF CONSTRUCTION THEREOF

James P. Edwards, 700 W. Fireweed La., Anchorage, Ak. 99503

Filed Oct. 31, 1995, Ser. No. 550,762

Int. Cl.[6] C25D *1/00;17/04;* **C25C** *7/02;* **B29C** *33/40*

U.S. Cl. 204—281 **17 Claims**



1. A mask for selectively plating specific areas of a piece of metal comprising:

a) a first mask part, including a rubberized mold, and a hard plastic mold cover, said hard plastic mold cover being fixedly attached to said rubberized mold, said rubberized mold and said hard plastic mold cover having an area therein cut in a specific pattern for applying plating metal to the specific areas of said piece of metal;

b) a second mask part, including a rubberized mold, and a hard plastic mold cover, said hard plastic mold cover being fixedly attached to said rubberized mold, said rubberized mold and said hard plastic mold cover having an area therein cut in a specific pattern for applying plating metal to the specific areas of said piece of metal;

c) means for securing and holding said first mask part and said second mask part about said piece of metal; and

d) an electrode, fixedly attached to said second mask part such that said electrode is in electrical communication with said piece of metal when said second mask part is secured to said piece of metal for plating.

5,589,044

ELECTRODE FOR ELECTROLYSIS CELLS

Robert Scannell, Pfungstadt; Bernd Busse, Darmstadt, and Helmut Vormwald, Linsengericht, all of Germany, assignors to Heraeus Electrochemie GmbH, Hanau, Germany

Filed May 1, 1995, Ser. No. 431,898

Claims priority, application Germany, Jun. 1, 1994, 44 19 274.6

Int. Cl.[6] C25B *11/02;1/36*

U.S. Cl. 204—286 **11 Claims**

1. Electrode for mercury chlor alkali electrolytic cells comprising

a plurality of active electrode elements in the form of parallel bars, each bar having opposed lateral sidewall surfaces, an

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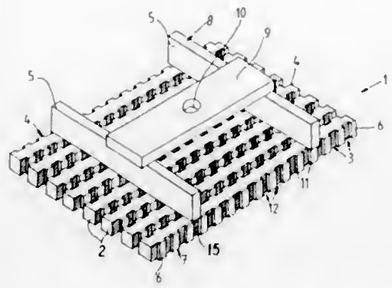


upward facing top surface, and a downward facing bottom surface, said lateral sidewall surfaces being provided with recesses, each recess extending from said top surface to said bottom surface,

at least two spaced apart current distributors extending transversely of said parallel bars and welded to said top surfaces, and

means for supplying electrical current to said distributors.

5,589,045

DATA MANAGING METHOD IN PORTABLE BLOOD SUGAR VALUE-MEASURING AND PORTABLE BLOOD SUGAR VALUE-MEASURING APPARATUS USING SAME

Hiroshi Hyodo, Kyoto, Japan, assignor to Kyoto Daiichi Kagaku Co., Ltd., Kyoto, Japan

Filed Oct. 31, 1994, Ser. No. 331,813

Claims priority, application Japan, Nov. 2, 1993, 5-274228

Int. Cl.[6] G01N *27/26*

U.S. Cl. 204—406 **27 Claims**

1. A data managing method, to be carried out in a portable blood sugar value-measuring apparatus having no operation button, of selectively and removably mounting a selected one of several electrodes on the apparatus to execute a function corresponding to a resistance value of the selected electrode, comprising:

a preparatory process of mounting the electrode on the portable blood sugar value-measuring apparatus to set the apparatus to an operation start state and to select the function to be executed in correspondence with the mounted electrode,

a first clocking process of clocking a first period of time after the execution of the preparatory process terminates;

a first dropping-determining process for determining whether the first clocking process has been switched over to a blood sugar value-measuring process for measuring a blood sugar value of to-be-measured liquid which has been dropped to the mounted electrode while clocking of the first period of time is being executed in the first clocking process;

a storing process for storing a measured blood sugar value in storing means subsequent to the first clocking process being switched over to a blood sugar value-measuring process; and

a read-out process for reading out measured blood sugar data stored in the storing means from a termination point of the first period of time and outputting the measured blood sugar data read out from the storing means when the first period of time has terminated without the switchover from the first clocking process to the blood sugar value-measuring process being decided in the first dropping-determining process.

5,589,046

ROOM TEMPERATURE CARBON MONOXIDE GAS SENSOR AND THE PROCESS FOR PREPARING THE SAME

Wenfan Li, and Xiuying Liu, both of Changchun, China, assignors to Chang Chun Institute of Applied Chemistry of the Chinese Academy of Sciences, Changchun, China

Filed Dec. 16, 1994, Ser. No. 358,217

Claims priority, application China, Mar. 17, 1994, 94101843.1

Int. Cl.[6] G01N *27/12;27/26*

U.S. Cl. 204—424 **2 Claims**

1. A room temperature carbon monoxide gas sensor comprising two helical coil electrodes made from ϕ0.03–0.05 mm Pt filament, one of which having a greater coil diameter, and the other one having a smaller coil diameter, the length of the coil electrodes being in the range of 0.8–1.4 mm, the one having a greater diameter having a diameter in the range of 0.6–1 mm and being used as an anode, while the smaller diameter one having a diameter between 0.3–0.6 mm and being used as a cathode, the smaller diameter coil electrode being inserted in the greater diameter one, wherein, the two helical coil electrodes are coated by a composition having the following composition:

1 part (weight) of high purity SnO_2;

0.002–0.08 (weight) of high purity Pt black;

0.00025–0.065 part (weight) of high purity Y_2O_3;

0.00009–0.086 part (weight) of high purity La_2O_3;

0.00015–0.08 part (weight) of high purity Cr; and

0.0002–0.07 part (weight) of high purity Al_2O_3.

5,589,047

METHODS FOR THE SELECTION, SEPARATION AND FUSION OF CELLS

Hans G. L. Coster, Randwick; Robert G. Ashcroft, Sandringham, and Tohsak Mahaworasilpa, Randwick, all of Australia, assignors to Fucell Pty Limited, Randwick, Australia

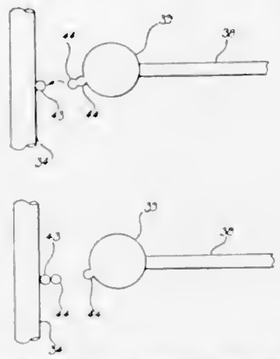
PCT No. PCT/AU92/00473, § 371 Date Apr. 5, 1994, § 102(e) Date Apr. 5, 1994, PCT Pub. No. WO93/05166, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 4, 1992, Ser. No. 204,253

Claims priority, application Australia, Sep. 5, 1991, PK8213

Int. Cl.[6] C25B *7/00*

U.S. Cl. 204—450 **24 Claims**



1. A method for the selective recovery of cells, vectors, particles or molecules expressing or presenting a defined ligand, comprising the steps of physically or chemically binding to a surface of a solid and immobile target a ligand or ligands complementary to the defined ligand, introducing the target into a suspension or solution of cells, vectors, particles or molecules in an electrically conductive liquid in which some of the cells, vectors, particles or molecules express or present the defined ligand, causing at least some of the cells, vectors, particles or molecules expressing or presenting the defined ligand to migrate into contact with the target and to bind with the complementary ligand or ligands by establishing between a pair of electrodes in the suspension or solution an alternating electric field of such a frequency, intensity and inhomogeneity that at least some of the cells, vectors, particles, ligands or molecules expressing or presenting the defined ligand will move towards the target, and separating the cells, vectors, particles or molecules which have bound to the target due to a dielectrophoretic force induced by the said alternating electric field from at least some of the other cells, vectors, particles or molecules in the suspension or solution.

5,589,048

METHOD FOR THE PRODUCTION OF A RADIOGRAPHIC SCREEN

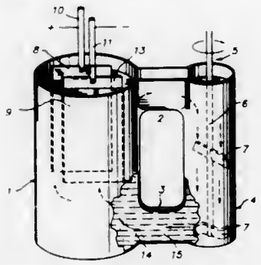
Nikolaas De Jaeger, Hove; Guy Damen, Dessel, both of Belgium; Gerhard Winter, Goslar, Germany, and Jan Van Havenbergh, Zwijndrecht, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 983,708, Dec. 1, 1992, Pat. No. 5,296,117. This application Feb. 17, 1994, Ser. No. 197,825

Claims priority, application European Pat. Off., Dec. 11, 1991, 91203238

Int. Cl.[6] C25D *13/02;13/10*

U.S. Cl. 204—489 **5 Claims**



1. A radiographic screen wherein a supported phosphor-containing layer electrophoretically deposited particles are present in conjunction with a resin binder and the volume ratio of phosphor-to-resin binder is in the range from 80/20 to 99.9/0.1, the density of the phosphor is at least 5 g/m^3 and wherein said phosphor particles are present in contact with a surface active compound which is a member selected from the group consisting of an alkyl aryl polyether sulphate, an organic phosphate, a phosphate ester, and a phospholipid.

5,589,049

METHOD OF COATING ELECTRICALLY CONDUCTIVE SUBSTRATES, AQUEOUS ELECTRODIP PAINTS, PROCESS FOR THE PREPARATION OF AN AQUEOUS DISPERSION OF CROSSLINKED POLYMER MICROPARTICLES AND DISPERSIONS PREPARED BY THIS PROCESS

Günther Ott; Hardy Reuter; Walter Jouck; Susanne Piontek; Ulrich Heimann, all of Münster, Germany, and John Gilbert, Beverly Hills, Mich., assignors to BASF Lacke + Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP93/00291, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/16139, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 8, 1993, Ser. No. 284,406

Claims priority, application Germany, Feb. 15, 1992, 42 04 581.9

Int. Cl.[6] C25D *13/04*

U.S. Cl. 204—504 **16 Claims**

1. Method of coating electrically conductive substrates comprising the steps of

(1) immersing the electrically conductive substrate in an aqueous electrodip paint which contains at least one cathodically depositable synthetic resin together with crosslinked polymer microparticles,

(2) connecting the substrate as cathode,

(3) depositing a film by direct current on the substrate,

(4) removing the coated substrate from the electrodip paint, and

(5) baking the deposited paint film,

wherein the crosslinked polymer microparticles contained in the aqueous electrodip paint are prepared by reacting

(A) a compound which contains on average more than 1.0 epoxide group per molecule, or a mixture of such compounds, with

(B) a compound which contains a group reactive toward epoxide groups and at least one ketimine or aldimine group in the molecule, or a mixture of such compounds to give a non-crosslinked intermediate product (C), which contains on average at least one epoxide group per molecule, and dispersing the intermediate product in the presence of a Brönsted acid in an aqueous medium, and subsequently reacting the epoxide groups on the intermediate product (C) with the amino groups on the ketimine to form crosslinked particles.

5,589,050

ELECTRODIALYZER FOR DESALINATION

Igor N. Medvedev, Moscow, and Klim A. Schogenov, Nalchik, both of Russian Federation, assignors to Aquamin Company Limited

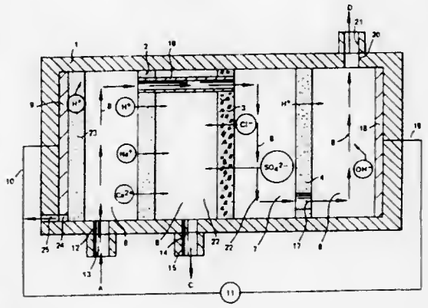
PCT No. PCT/GB93/00675, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO93/20012, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 31, 1993, Ser. No. 313,284

Claims priority, application United Kingdom, Mar. 31, 1992, 9207080

Int. Cl.[6] B01D *61/44;* **C02F** *1/469*

U.S. Cl. 204—630 **5 Claims**



1. An electrodialyzer comprising:

a container having

an input for supplying aqueous solution to be desalinated and

an output for carrying substantially desalinated solution out of the container,

at least one membrane adapted to provide an anion exchange,

at least one membrane adapted to provide a cation-exchange,

a flow path from the input to the output across a surface of each of the membranes successively, and

a concentration chamber separated from successive portions of the flow path by an anion exchange membrane, and by a cation-exchange membrane, and

means for drawing off fluid accumulating in the concentration chamber, and

an anode arranged at the beginning of the flow path in abutment with the container and with a cation-exchange membrane.

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5,589,051

CLAMP FOR USE WITH ELECTROPLATING APPARATUS AND METHOD OF USING THE SAME

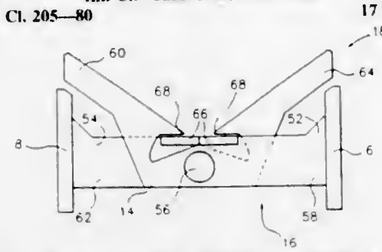
Paul Henington, Tsuen Wan, Hong Kong, assignor to Process Automation International Limited, New Territories, Hong Kong

Filed Dec. 9, 1994, Ser. No. 353,197

Claims priority, application United Kingdom, Dec. 10, 1993, 9325297

Int. Cl.[6] C25D *5/00;17/06;17/08*

U.S. Cl. 205—80 **17 Claims**



5. A method for electrolytic deposition of a coating of metal on an electroplatable substrate, the substrate having a lower edge, the method comprising the following steps:

supporting at least one substrate in a substantially vertical plane for submersion into an electrolyte bath;

positioning the substrate over the electrolyte bath;

submersing the substrate into the electrolyte bath; and

clamping the substrate at its lower edge as the substrate enters the electrolyte bath,

wherein the step of clamping the substrate comprises the step of moving a clamp between an open position and a closed position as the substrate is submersed into the electrolyte bath, the clamp comprising at least two levers pivotally attached to each other at a fulcrum, and at least one gripping member located on each lever for gripping the substrate, wherein the clamp, when floating on top of the electrolyte bath is in an open position, but when submersed into the electrolyte bath is caused, by virtue of its buoyancy, to move to a closed position, such that in the open position the gripping members are spaced apart from each other, and such that in the closed position, the gripping members are adjacent to each other and on either side on the substrate so as to grip the substrate with the gripping members.

5,589,052

METHOD FOR ELECTROLYZING WATER

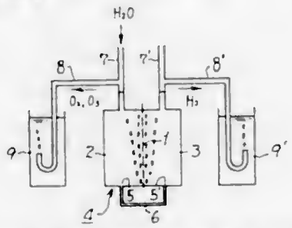
Takayuki Shimamune, Tokyo; Shuji Nakamatsu, Kanagawa; Isao Sawamoto, Kanagawa, and Yoshinori Nishiki, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Continuation of Ser. No. 413,495, Sep. 27, 1989. This application Sep. 17, 1991, Ser. No. 759,975

Claims priority, application Japan, Sep. 29, 1988, 1-244979

Int. Cl.[6] C25B *15/00*

U.S. Cl. 205—349 **1 Claim**



1. A method of water electrolysis using an electrolytic cell comprising an anode compartment, a cathode compartment, a diaphragm separating the anode and cathode compartments, means for recycling electrolyte from the cathode compartment to the anode compartment comprising a conduit connecting the anode and cathode compartments, and a water supply line for the anode compartment, comprising the steps of supplying through said water supply line an electrolyte of pure water to the anode compartment alone and not to the cathode compartment, which water permeates the diaphragm to enter the cathode compartment, electrolyzing the water electrolyte to evolve an ozone-containing oxygen gas in the anode compartment and hydrogen in the cathode compartment, thereby resulting in a net transfer of electrolyte from the anode compartment to the cathode compartment through the diaphragm, maintaining the internal gas pressures of the anode and cathode compartments substantially equal to each other, and recycling the water electrolyte from the cathode compartment to the anode compartment through the conduit such that the liquid level in the anode and cathode compartments is kept substantially the same.

5,589,053

ELECTROLYSIS PROCESS FOR REMOVAL OF CAUSTIC IN HEMICELLULOSE CAUSTIC

Stephen W. Moran; John R. Jackson, both of Wilmington; Timothy J. Gallivan, Hampstead, all of N.C., and Richard E. Loftfield, Fruitcove, Fla., assignors to Huron Tech Incorporated, Kingston

Filed Nov. 3, 1995, Ser. No. 553,019

Int. Cl.[6] C02F *1/461*

U.S. Cl. 205—698 **10 Claims**

1. A process for recovering pulping chemicals and hemicellulose from an essentially lignin free starting solution comprising hemicellulose and caustic said process comprising:

A) electrolyzing in an anolyte compartment of an electrolytic cell a hemicellulose starting solution containing about 2 to about 20 percent by weight of caustic to reduce the caustic content of said anolyte to about 10 to about 20 grams per liter without precipitation of said hemicellulose to obtain a caustic content in a catholyte compartment of said cell of about 60 to about 80 percent of the caustic content of said starting solution, said cell comprising an anode in said anolyte compartment and a cathode in said catholyte compartment, and said anode and cathode separated by a cationic permselective membrane cell separator and

B) removing a caustic solution from the catholyte of said cell having a concentration of up to about 490 grams per liter.

5,589,054

Patent Not Issued For This Number

5,589,055

METHOD FOR PREPARING CARBON FIBERS

Masanobu Kobayashi, Iyo-gun; Motoi Itoh, Iyo; Yoji Matsuhisa, Iyo-gun, and Kazuharu Shimizu, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 293,817, Aug. 22, 1994, Pat. No. 5,462,799. This application Jun. 5, 1995, Ser. No. 460,917

Claims priority, application Japan, Aug. 25, 1993, 5-210282; Jan. 14, 1994, 6-002582; Feb. 16, 1994, 6-019219

Int. Cl.[6] C25F *1/00*

U.S. Cl. 205—768 **11 Claims**

2. A process for preparing a carbon fiber, comprising anodically electrolyzing a carbon fiber in an alkaline aqueous solution, or anodically electrolyzing a carbon fiber in an acidic aqueous solution followed by washing with an alkaline aqueous solution, and then applying a sizing agent consisting essentially of an aromatic compound with multiple epoxy groups and having 6–47 atoms between the epoxy groups and an aromatic ring, said atoms between said epoxy groups and said aromatic ring having a linear structure and linking said epoxy groups and said aromatic ring, to the fiber.

5,589,056

PROCESS FOR ELECTROECLAMATION OF SOIL MATERIAL

Wieberen Pool, Kaliumstraat 46, 9743 RV Groningen, Netherlands

Continuation of Ser. No. 47,079, Apr. 16, 1993, Pat. No. 5,433,839, which is a continuation of Ser. No. 680,607, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 255,988, Oct. 11, 1988, abandoned. This application Apr. 19, 1995, Ser. No. 424,073

Claims priority, application Netherlands, Oct. 13, 1987, 8702437

Int. Cl.[6] C25F *1/00*

U.S. Cl. 205—766 **10 Claims**

1. An electroreclamation process for removing from soils polluted therewith, contaminants having the ability to move toward an electrode under the influence of an electric current, which comprises the steps of:

(a) enclosing within a porous housing at least one electrode adapted to serve as a cathode when connected to the negative pole of a DC voltage source and placed in current conducting relationship with at least one anode;

(b) enclosing within a separate porous housing at least one electrode adapted to serve as an anode when connected to the positive pole of a DC voltage source and placed in current conducting relationship with at least one cathode;

(c) placing the separately housed electrodes of steps (a) and (b) in current-conducting relationship with one another and with the soil to be treated;

(d) supplying a medium capable of conducting current to the housed electrode(s) of step (a) through a cathodic circulation system and supplying a medium capable of conducting current to the housed electrode(s) of step (b) through a separate anodic circulation system;

(e) connecting the housed electrode(s) of step (a) to the negative pole of a DC voltage source and the housed electrode(s) of step (b) to the positive pole of a DC voltage source, thereby forming at least one cathode and at least one anode;

(f) passing an electric current through the soil to be treated and between the cathode(s) and anode(s), thereby causing migration of contaminants through the soil;

(g) removing the contaminants which migrate to the cathode(s) and the contaminants which migrate to the anode(s); and

(h) monitoring, and when necessary, controlling and adjusting the pH, conductivity, temperature and current intensity of the medium within each of the cathodic circulation system and the anodic circulation system.

5,589,057

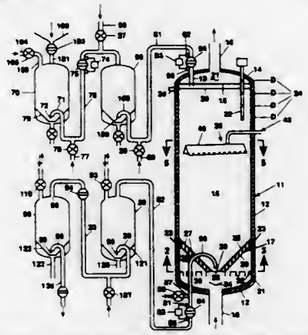
METHOD FOR EXTENDING THE LIFE OF HYDROPROCESSING CATALYST

Harold J. Trimble, Hercules, Calif., and Brian A. Darsow, St. Louis Park, Minn., assignors to Chevron U.S.A. Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 235,043, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 215,254, Mar. 21, 1994, Pat. No. 5,409,598, which is a continuation of Ser. No. 14,847, Apr. 1, 1993, abandoned, which is a continuation of Ser. No. 727,656, Jul. 9, 1991, abandoned, which is a division of Ser. No. 381,948, Jul. 19, 1989, Pat. No. 5,076,908. This application Nov. 21, 1994, Ser. No. 342,527

Int. Cl.[6] C10G *35/00*

U.S. Cl. 208—148 **26 Claims**



1. A method for reducing the quantity of hydroprocessing catalyst required for upgrading a hydrocarbon feed stream to essentially the same degree as or when compared to the quantity of hydroprocessing catalyst required for upgrading the hydrocarbon feed stream in a once through hydroprocessing catalyst replacement mode, comprising the steps of:

(a) withdrawing a volume of particulate catalyst from a hydroconversion reaction zone including a substantially packed bed of hydroprocessing catalyst having an initially packed bed volume and which is essentially plug-flowing downwardly in the hydroconversion reaction zone and wherein said withdrawn volume of particulate catalyst includes a high-activity less dense catalytic particulates and a low-activity more dense catalytic particulates;

(b) separating in a separation zone said high-activity less dense catalytic particulates from said low-activity more dense catalytic particulates;

(c) admixing said high-activity less dense catalytic particulates with fresh catalytic particulates to produce a catalytic mixture having a mixture volume that is less than the withdrawn volume of particulate catalyst; and

(d) introducing said catalytic mixture of step (c) into said hydroconversion reaction zone of step (a) such that said substantially packed bed of hydroprocessing catalyst which is essentially plugflowing downwardly in said hydroconversion reaction zone of step (a), has a subsequent packed bed volume that is less than the initially packed bed volume.

5,589,058

APPARATUS FOR TREATMENT OF WATER

Matthew J. Bauer, Niles, Mich., assignor to M. J. Bauer Company, Inc., Granger, Ind.

Filed Oct. 28, 1994, Ser. No. 331,050

Int. Cl.[6] C02F *1/42*

U.S. Cl. 210—98 **13 Claims**

1. A water treatment system, comprising:

a treatment tank having an ion-exchange mineral bed therein;

a valve head assembly disposed on top of and in fluid communication with said treatment tank, said valve head assembly including a passage means for allowing a flow of fluid

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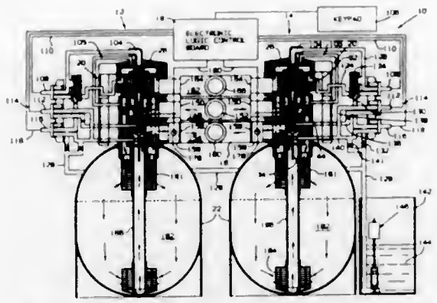


through said valve head assembly, means disposed within said passage means for creating a vacuum pressure within said treatment tank, a drain disposed within said passage means and at a downstream side of said vacuum pressure creating means, a valve disposed within said passage means and at a downstream side of said vacuum pressure creating means, said valve movable to an open position and a closed position for allowing fluid flow through said vacuum pressure creating means, and means for directing a portion of the fluid flowing through said vacuum pressure creating means to said drain and directing a lesser remaining portion of the fluid flowing through said vacuum pressure creating means to said valve when said valve is in said open position.

5,589,059

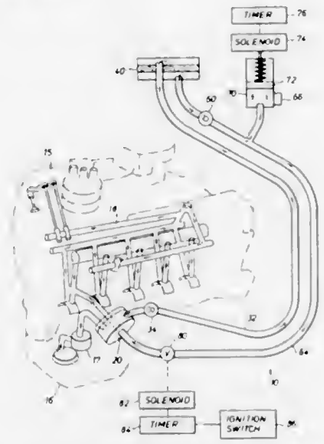
OIL FILTER ADAPTER SYSTEM INCORPORATING AN ACCESSIBLE FILTER ELEMENT

James E. Semar, P.O. Box 9412, New Iberia, La. 70562

Filed Jun. 7, 1995, Ser. No. 481,106

Int. Cl.[6] B01D *35/153*

U.S. Cl. 210—109 **15 Claims**



12. A lubrication filter system adapted for use with an automobile engine in an engine compartment provided with a pre-existent threaded fitting for a disposable cartridge filter on the engine wherein the system comprises:

(a) an adapter for threaded connection to an automobile engine in lieu of the replaceable cartridge filter normally placed in the engine oil lubrication system, wherein said adapter includes adapter inlet and adapter outlet connections;

(b) a first oil flow line extending from said adapter outlet connection and connected by means of a filter housing inlet fitting with a separate filter housing adapted to be installed at an elevated location within the engine compartment, wherein said housing:

(i) receives a removable lubricant filter,

(ii) has a removable upper cover over a lower portion and said cover fits on said lower portion to define a leak proof chamber for receiving a removable and disposable cartridge filter fitting therein,

(iii) incorporates fluid flow passages so oil is forced to flow through said filter for filtration, and

(iv) has a filter housing outlet fitting;

c) a second oil flow line extending between said adapter inlet connection and said filter housing outlet fitting, wherein said flow lines incorporate a valve system to deliver oil therethrough, and wherein said valve system prevents drainage of oil from said filter housing by means of a first valve means in said first flow line and a second valve means in said second flow line, and wherein said second flow line returns filtered oil through said adapter to the engine; and

(d) a filtered oil storage reservoir which connects to said second flow line at a point between said filter housing outlet fitting and said second valve means, wherein said filtered oil storage reservoir includes

(i) a closed cylinder,

(ii) a piston in said cylinder,

(iii) a bias device acting to bias said piston to form pressure on oil in said cylinder,

(iv) an electrically operated device to move said piston momentarily to decrease pressure on oil in said cylinder and then restore pressure to the oil in said cylinder.

5,589,060

FILTER FOR LIQUIDS, IN PARTICULAR INTERNAL-COMBUSTION ENGINE LUBRICANT OILS

Hans Gebert, Heilbronn-Bockingen; Rolf Möhle, Scheppach; Dietmar Sonntag, Remseck; Elke Bruss, Asperg; Dietwart Guntert, Sachsenheim, and Hubert Müller, Stuttgart, all of Germany, assignors to Knecht Filterwerke GmbH, Stuttgart, Germany

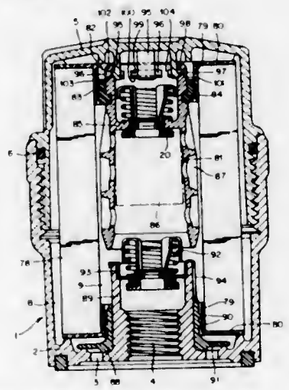
PCT No. PCT/DE92/00228, § 371 Date Sep. 14, 1993, § 102(e) Date Sep. 14, 1993, PCT Pub. No. WO92/17262, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 16, 1992, Ser. No. 117,210

Claims priority, application Germany, Mar. 28, 1991, 41 10 307.6; Sep. 20, 1991, 41 31 353.4; Jan. 17, 1992, 42 01 041.1

Int. Cl.[6] B01D *35/02*

U.S. Cl. 210—130 **21 Claims**



21. Filter for liquids, comprising

a filter housing including an inlet means and an outlet means, a cover separable from said housing, said housing containing at least one ring-shaped, exchangeable filter element separable from said housing having two axial ends and having an interior space, each said axial end defining an inside and a face side;

a support part within said housing, said support part being separable from the at least one filter element and extending at least partly centrally through the interior space of the filter element, and said support part being supported on the cover by a support means;

first and second radial inner seals separating a crude space surrounding an exterior of said filter element from a clean space contained with interior space of the filter element, and said radial inner seals mounted within said filter element at the axial ends of the filter element;

said separable filter element being folded star-shaped and sealed on each said face side by an end disk and provided on the inside at each of its two axial ends with a sleeve having a radial inner surface for resting against a radial outer surface the radial inner seals;

said radial inner seals comprising said first radial seal positioned on the support part for separating the crude space from the clean space and said second radial inner seal positioned on said outlet means; and

an overflow valve contained within the support part for establishing a flow connection between said crude space and said interior space when a pressure difference therebetween exceeds a predetermined value;

wherein said outlet means comprises a tubular short pipe projecting into the interior space of the filter element, said pipe being centrally shaped by molding on the filter housing for receiving said second radial inner seal separating the crude space from the clean space;

a return check valve within said short pipe for preventing flow into said interior space via said pipe; and,

wherein said support means includes a releasable snap connection means on the support part for detachably connecting the housing cover to the support part.

5,589,061

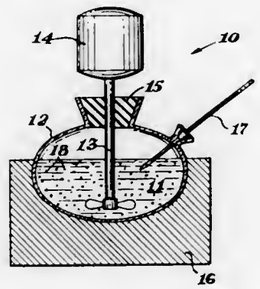
PROCESS FOR THE PREPARATION OF CELLULOSE BASED CHIRAL SEPARATION LIQUID CHROMATOGRAPHY STATIONARY PHASE

John W. Russell, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1995, Ser. No. 402,663

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 **10 Claims**



1. A process for preparing a cellulose ester liquid chromatographic stationary phase, comprising the step of: reacting solid cellulose with an aromatic acid halide in the presence of a base catalyst, the temperature being below the temperature at which the cellulose ester dissolves, the concentration of the base catalyst being below the concentration at which the cellulose ester dissolves, the reaction time being less than the reaction time at which the cellulose ester dissolves.

5,589,062

RADIAL FLOW CHROMATOGRAPHY

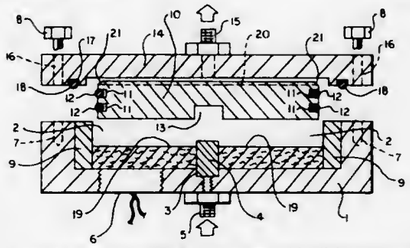
Richard G. Rice, Baton Rouge, La., assignor to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Division of Ser. No. 23,144, Feb. 24, 1993, Pat. No. 5,433,847, which is a continuation of Ser. No. 580,582, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 430,495, Nov. 1, 1989, abandoned. This application May 30, 1995, Ser. No. 452,851

The portion of the term of this patent subsequent to Jul. 18, 2012, has been disclaimed.

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 **9 Claims**



1. A replaceable, radial-flow chromatographic diskette comprising at least two chromatographic beds, a first said bed and a second said bed:

(a) wherein each of said beds has the shape of a right circular cylinder having a width substantially greater than its height;

(b) wherein each of said beds comprises sorbent particles having a mean diameter less than 300 micron;

(c) wherein the distribution of the particles within each of said beds is substantially uniform;

(d) wherein each of said beds has a porosity less than thirty percent;

e) wherein said diskette further comprises a plate in the shape of a right circular cylinder adjacent both the first said bed and the second said bed, which plate separates said first and second beds;

f) wherein the axes of symmetry of the first said bed, the second said bed, and said plate are collinear; and

g) wherein said diskette further comprises means for transporting a fluid from said first bed to said second bed, said transporting means comprising said plate, wherein said plate has grooves fluidly connecting said first and second beds.

5,589,063

COLUMN ANALYZER SYSTEM AND IMPROVED CHROMATOGRAPH COLUMN FOR USE IN THE SYSTEM

James R. M. Sanford, Vidor; Patrick M. Frank, Beaumont; Joseph H. Golias, Beaumont, and William C. Jennings, Beaumont, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 285,014, Sep. 16, 1994, Pat. No. 5,441,645, which is a division of Ser. No. 58,364, May 10, 1993, Pat. No. 5,358,641, which is a division of Ser. No. 779,186, Oct. 22, 1991, Pat. No. 5,228,988, which is a continuation-in-part of Ser. No. 733,714, Jul. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 708,298, May 31, 1991, Pat. No. 5,207,918, which is a division of Ser. No. 427,346, Oct. 27, 1989, Pat. No. 5,045,208. This application Jun. 6, 1995, Ser. No. 470,991

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 **24 Claims**

1. A chromatographic column, comprising:

a hollow plastic shell having a reservoir portion with an end, a tip portion with an end, and a barrel portion connected between the reservoir and tip portions;

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a chromatographic medium in the barrel portion; and

a foil member attached to the end of the reservoir portion to close it, the foil member having a metal layer and at least one plastic layer which separates the metal layer from the shell.

5,589,064

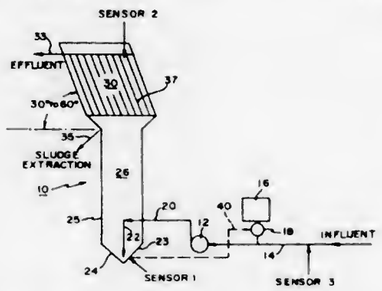
APPARATUS FOR LIQUID SOLID SEPARATION OF LIQUID EFFLUENTS OR WASTEWATER

Samuel Elmaleh, 21 Rue De L'Abbe' Camozy, 34830 Clapiers, France

Filed Oct. 24, 1994, Ser. No. 327,939

Int. Cl.[6] C02F *1/52*

U.S. Cl. 210—206 **8 Claims**



1. Apparatus for treating liquid effluent or wastewater containing pollutant particles in a suspension comprising:

a vessel defining a reactor for receiving and containing a flow of a liquid effluent or wastewater containing pollutant particles in a suspension and having a chemical therein for assisting agglomeration of said particles;

said reactor having a lower volume therein defining a coagulation zone comprising an injector in said lower volume of said reactor for delivering said flow in a given direction in the said lower volume;

said reactor lower volume defining a coagulation zone comprising convergent internal reaction surfaces having a fixed configuration for effecting intense mixing of said flow received in said coagulation zone and flowing said flow upwardly in said lower volume of said reactor;

said injector in said lower volume of said reactor coactive with said internal reaction surfaces disposed for delivering said flow against the reaction surfaces to develop counterflows for effectively causing said intense mixing by said reaction surfaces in the lower volume of said reactor defining said coagulation zone;

said reactor having a volume above and contiguous with the coagulation zone into which the intensely mixed effluent or wastewater and chemical therein rises upwardly from said coagulation zone, and dimensioned for effectively allowing the primary particles to coalesce therein and effective flocculation to take place so that a flocculation zone is defined in the reactor above the coagulation zone;

said reactor having at an upper part contiguous with the flocculation zone a volume tree or turbulence receiving effluent or wastewater from the flocculation zone and defining a settling and separation zone for settling of flocculant comprising the coalesced contaminant particles and separation of solids and liquid; and

means for discharging the clarified water and solids from said settling and separation zone.

5,589,065

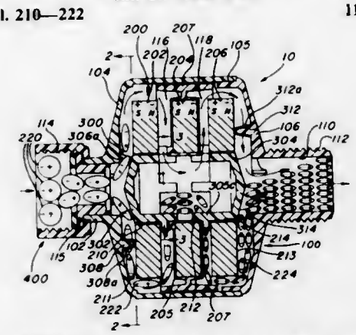
MAGNETOHYDRODYNAMIC DEVICE

Jacob G. Bogatin, Richboro, Pa., and Vladimir Podoyma, Leningrad State, U.S.S.R., assignors to YBM Magnetics, Inc., Newtown, Pa.

Filed Feb. 4, 1994, Ser. No. 191,838

Int. Cl.[6] C02F *1/48*

U.S. Cl. 210—222 **11 Claims**



1. An apparatus for magnetically treating a fluid comprised of non-polar molecular clusters flowing therethrough said apparatus comprising:

a housing having an inlet and an outlet, said housing being adapted to permit said fluid to flow therethrough between said inlet and outlet within the interior of said housing;

a first magnet stationarily positioned transverse to the fluid flow direction within said housing, said first magnet having first and second sides of opposite polarity and an opening therethrough between said first and second sides;

a second magnet spaced from and substantially parallel to said first magnet, said second magnet having an outer circumference spaced from the interior surface of said housing, said second magnet having first and second sides of opposite polarity;

said first and second magnets being positioned adjacent and parallel to each other with sides of opposite polarity facing each other;

support means within said housing for resiliently supporting and spacing said magnet means within said housing, said support means being comprised of:

first support members between said first and second magnets resiliently spacing said first and second magnets from each other; and

second support members within said housing resiliently positioning said second magnet from the interior surface of said housing;

said second magnet having an opening therethrough between said first and second sides thereof; and

said first support member being comprised of a first plug fitted within said opening through said second magnet and said opening through said first magnet, and spacing said first and second magnets from each other, said first plug further having a plurality of channels therethrough communicating between the space between said first and second spaced magnets and said opening through said first magnet, said first plug being comprised of:

a first plug member fitted within said opening through said second magnet;

a plurality of first projections extending from said first plug member into said opening through said first magnet; and

a plurality of second projections transverse to said first projections between said first and second magnets.

5,589,066

PORTABLE WATER PURIFICATION SYSTEM

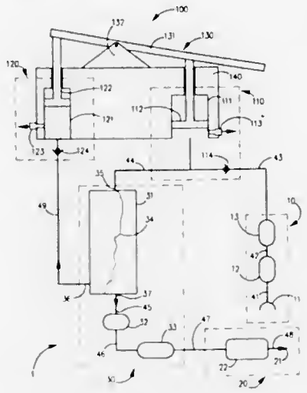
Buddy D. Gray, Dellrose, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 120,400, Sep. 14, 1993, Pat. No. 5,496,466.

This application Jul. 22, 1994, Ser. No. 277,316

Int. Cl.[6] B01D *36/00*

U.S. Cl. 210—258 **4 Claims**



1. A portable water purification system comprising:

a prefilter means connectable to a feed water source;

a pump system immediately connected to said prefilter means;

a reverse osmosis filter means connected to said pump system, said reverse osmosis filter means including an input means, permeate output means, and a concentrate output means;

a microbial control means connected to said permeate output means; and

a post filter means connected to said microbial control means; and

wherein said prefilter means includes:

a water pickup means connected to said feed water source for obtaining feed water from said feed water source;

a screen filter means connected to said water pickup means; and

an adsorption filter means connected to said screen filter means, wherein said adsorption filter means is connected to said pump system.

5,589,067

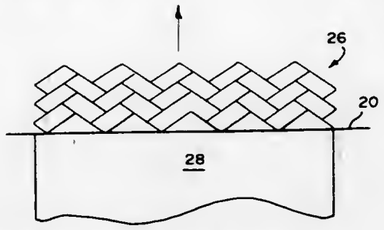
EXPANDED METAL FILTER SUPPORT STRUCTURE

Patrick E. Rice, Winthrop Harbor, Ill., assignor to Jason, Inc., Milwaukee, Wis.

Filed Sep. 18, 1995, Ser. No. 529,308

Int. Cl.[6] B01D *27/06*

U.S. Cl. 210—493.5 **12 Claims**



1. A filter media support structure comprising:

a generally cylindrically shaped pleated shell with each pleat of the pleated shell aligned parallel to a longitudinal axis of the shell and distributed around a circumference of the shell to form a zig-Zag patterned outer wall of the pleated shell around a circumference of the shell, when viewed in cross-section;

a first row of perforations parallel to the longitudinal axis in a planar element of each pleat of the pleated shell, mutually separated one from another by a perforation distance; and

at least a second row of perforations parallel to the first row of perforations offset from the first row of perforations along the longitudinal axis by a first offset distance greater than zero and less than one-half the perforation distance and offset along a second orthogonal axis of the planar element transverse to the longitudinal axis by a second offset distance.

5,589,068

METHOD OF CONTROLLING WASTE WATER PURIFICATION PLANTS USING MULTIPLE CONTROL FUNCTIONS

Marinus K. Nielsen, Virum, Denmark, assignor to I. Krüger Systems A/S, Søborg, Denmark

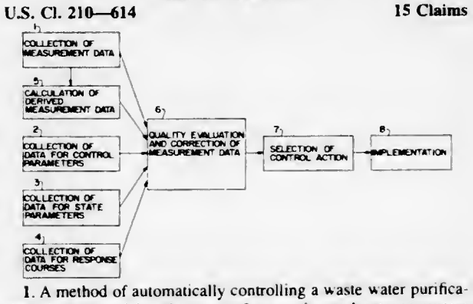
PCT No. PCT/DK92/00290, § 371 Date Mar. 22, 1994, § 102(e) Date Mar. 22, 1994, PCT Pub. No. WO93/07088, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 1, 1992, Ser. No. 211,333

Claims priority, application Denmark, Oct. 1, 1991, 1678/91

Int. Cl.[6] C02F *3/00*

U.S. Cl. 210—614 **15 Claims**



1. A method of automatically controlling a waste water purification plant comprising the steps of measuring at least one system parameter, determining a control parameter on the basis of the measurement results obtained and a selected control function, selecting a control action on the basis of the determined control parameter, and subsequently implementing the selected control action, wherein the control parameter is determined on the basis of the measurement results for at least two parameters and the control functions associated with said parameters.

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5,589,069

METHOD FOR SEPARATING AND ANALYZING IONS BY ELECTROSTATIC ION CHROMATOGRAPHY AND A ZWITTERIONIC STATIONARY PHASE FOR ION CHROMATOGRAPHY AND METHOD FOR SEPARATING AND ANALYZING ANALYTES BY MULTIFUNCTIONAL LIQUID CHROMATOGRAPHY

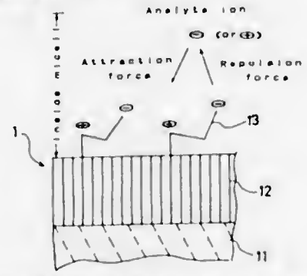
Hu Wenzhi, Nagoya, Japan, assignor to Soichi Inoue, Japan

Continuation of Ser. No. 107,608, Aug. 18, 1993, abandoned. This application Jun. 12, 1996, Ser. No. 661,892

Claims priority, application Japan, Oct. 5, 1992, 4-290739; Apr. 5, 1993, 5-103625

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—635 **12 Claims**



1. A method of separating and analyzing ions by electrostatic ion chromatography, comprising the steps of:

(i) injecting a sample solution containing analyte anions and cations into one end of a separation column packed with a solid phase, and

(ii) thereafter eluting the column with water to analyze individually the analyte ions via the difference in the retention time among the individual analyte ions,

wherein the solid phase is a zwitterionic stationary phase comprising a support carrier and a zwitterionic layer formed on the surface of the support carrier by directly or indirectly coating thereon 3-[3-cholamidopropyl]dimethyl ammonio]-1-propanesulfonate, 3-[3-cholamidopropyl]dimethyl ammonio]-2-hydroxy-1-propanesulfonate, sodium taurodeoxycholate or sodium taurocholate.

5,589,070

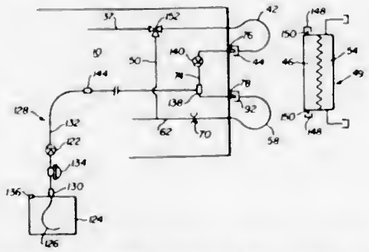
METHOD AND APPARATUS FOR CLEANING A DIALYSATE CIRCUIT DOWNSTREAM OF A DIALYZER

Jo-Ann B. Maltais, Morrison, Colo.; Archie T. Wood, Toronto, Ohio, and Roy S. Hovland, Denver, Colo., assignors to COBE Laboratories, Inc., Lakewood, Colo.

Continuation-in-part of Ser. No. 92,705, Jul. 16, 1993, Pat. No. 5,409,612. This application Jan. 13, 1995, Ser. No. 372,112

Int. Cl.[6] B01D *65/00;61/30*

U.S. Cl. 210—636 **26 Claims**



13. A method for cleaning a dialysis machine, comprising:

providing a dialysis machine, the dialysis machine comprising:

a dialyzer having a dialysate portion and a blood portion;

a dialysis delivery system to deliver dialysate to the dialysate portion of the dialyzer having an external dialysate line with a dialyzer inlet connector;

a dialysate waste system to remove spent dialysate from the dialysate portion of the dialyzer having an external spent dialysate line with a dialyzer outlet connector;

a blood delivery system for delivering a patient's blood to the blood portion of the dialyzer;

a blood return system for returning the patient's blood to the patient from the blood portion of the dialyzer;

a bypass block comprising a first bypass block connector adapted to connect to the dialyzer inlet connector and a second bypass block connector adapted to connect to the dialyzer outlet connector and a conduit interconnecting the first bypass block connector and the second bypass block connector;

a check valve located in the conduit intermediate the first and second bypass block connectors and oriented to permit fluid flow from the first bypass block connector to the second bypass block connector and to prevent fluid flow from the second bypass block connector to the first bypass block connector;

an injection means located in the conduit intermediate the check valve and the second bypass block connector; a container of cleaning agent

a cleaning agent connector adapted for connection to a container of cleaning agent;

a cleaning agent line interconnecting the injection means and the cleaning agent connector;

a pump located in the cleaning agent line intermediate the injection means and the cleaning agent connector and oriented to pump cleaning agent from the cleaning agent connector to the bypass means; and

a backflow prevention valve located in the cleaning agent line intermediate the pump and the injection means and oriented to permit fluid flow from the pump to the injection means and to prevent fluid flow from the injection means to the cleaning agent connector;

connecting the dialyzer inlet connector to the first bypass block connector;

connecting the dialyzer outlet connector to the second bypass block connector;

directing a flow of clean dialysate from the dialysate delivery system through the external dialysate line, bypass block and external spent dialysis line, to the spent dialysate system; and

pumping cleaning agent from the container of cleaning agent to the injection means to deliver a prescribed volume of cleaning agent at a prescribed rate.

5,589,071

ANION-EXCHANGE MEMBRANE EXTRACTOR FOR BORIC ACID SEPARATION

Kun-Jai Lee, Taejon, and Jong-Kil Park, Anyang, both of Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Taejon, Rep. of Korea

Filed Jul. 14, 1995, Ser. No. 502,758

Claims priority, application Rep. of Korea, Jan. 25, 1995, 95-1320

Int. Cl.[6] B01D *15/04*

U.S. Cl. 210—638 **2 Claims**

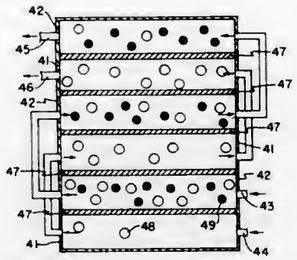
2. A method of separating boric acid from a concentrate of radioactive liquid waste contained in an evaporator which comprises the steps of:

passing the concentrate through a concentrate cell of an anion-exchange membrane extractor while an extract contained in a monitor tank is passed through an extract cell of the extractor;

allowing borate ions contained in the concentrate to flow into the extract; and,

allowing the concentrate and the extract to leave the concentrate cell and the extract cell and to enter the evaporator and the tank, respectively,

wherein the anion-exchange membrane extractor comprises:



an upper cell equipped with an inlet, an outlet;

a concentrate cell, an extract cell, and a lower cell, each of which has an upper layer and each of which is equipped with an inlet, an outlet, fluid-injecting holes, and a supporting shelf on the upper layer;

a water-proofing means inserted into the interface between said cells; a transporting tube connected to the inlets and outlets of said cells;

a supporting screen held up on the supporting shelf positioned in each of said cells; and,

an anion-exchange membrane supported by the said supporting screen

wherein said extractor does not require the application of an electric potential across said membrane for its function.

5,589,072

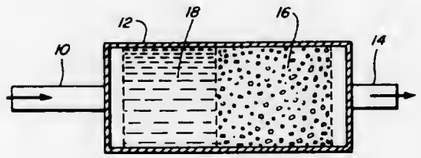
TRACE CAPTURE IN BIOLOGICAL FLUIDS

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92705

Filed Jul. 26, 1995, Ser. No. 507,761

Int. Cl.[6] B01D *15/00;* **A61M** *1/14*

U.S. Cl. 210—638 **2 Claims**



1. A method for treating blood, liquid blood fractions or protein solution comprising adding iodine to a biological fluid to be treated and thereafter capturing any residual iodine by passing the iodine-containing biological fluid through a substantially iodine free biocompatible, polymeric, elastomeric, lint-free, uniformly swellable hydrophilic sponge having a uniform pore geometry and pore size distribution throughout its volume comprising the inorganic acid-catalyzed reaction product of formaldehyde and polyvinyl alcohol, said sponge being characterized by a variation in the size of the diameter of the pores of less than about 8 to 1.

5,589,073

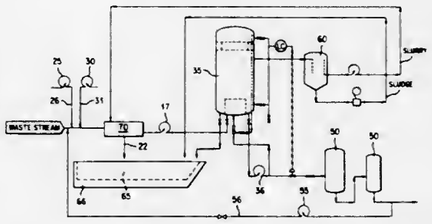
SYSTEM AND METHOD FOR REMOVING ASBESTOS AND OTHER SOLID PARTICLES FROM A SLURRY

Gordon R. Chapman, Missouri City; Donald R. Andruik, Houston; James V. Van Matre, Baytown; Andre Stenzel, Houston; Robert J. Logan, Humble; Edwin D. McCrory, Sugarland; Michael W. Singleton, Houston, all of Tex., and Robert M. Richmond, Bakersfield, Calif., assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 874,793, Apr. 27, 1992, Pat. No. 5,330,657. This application May 5, 1994, Ser. No. 239,201

Int. Cl.[6] C02F *1/52;1/24*

U.S. Cl. 210—704 **20 Claims**



1. A method for removing asbestos and other solid particles from a slurry collected during removal of coatings from pipelines, equipment or other structures, the method including:

(a) transferring the slurry from collection means to first separation means;

(b) injecting a first flocculent into the slurry;

(c) separating a first portion of solid particles from the slurry in said first separation means thereby forming a first remaining slurry containing solid particles;

(d) separating a second portion of solid particles from said first remaining slurry to form a second remaining slurry containing solid particles; and

(e) separating a third portion of solid particles from said second remaining slurry to form water recyclable to or dischargeable from said process.

5,589,074

Patent Not Issued For This Number

5,589,075

USE OF SILICON CONTAINING POLYELECTROLYTES IN WASTEWATER TREATMENT

Ananthasubramanian Sivakumar, Naperville; John H. Collins, Bloomingdale, and Manian Ramesh, Lisle, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Nov. 30, 1995, Ser. No. 565,479

Int. Cl.[6] C02F *1/56*

U.S. Cl. 210—727 **11 Claims**

1. A process for removing color from a paper mill waste effluent containing color bodies which comprises:

a) treating the waste effluent containing color bodies with an effective color-removing amount of a water-soluble silicon-containing copolymer coagulant prepared from diallyldimethylammonium halide and a vinyltrialkoxysilane wherein said copolymer has a reduced specific viscosity in one molar sodium nitrate solution for one percent polymer actives from 0.2 to 5 dl/gm and the mole ratio of diallyldimethylammonium halide to vinyl trialkoxysilane ranges from 99:9:0.1 to 80:20;

b) coagulating the color bodies present in the waste effluent; and then

c) removing the coagulated color bodies from the waste effluent.

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5,589,076

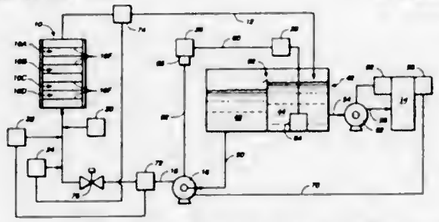
METHOD AND APPARATUS FOR OPTIMIZING OPERATION OF A FILTER SYSTEM

Thomas H. Womack, Novato, Calif., assignor to Womack International, Inc., Novato, Calif.

Continuation of Ser. No. 240,856, May 10, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 585,144

Int. Cl.[6] B01D *17/12;33/70*

U.S. Cl. 210—739 **48 Claims**



1. A method for optimizing operation of a pressure filter system comprising at least one readily replacable porous membrane or filter media supplying filtered fluid to a process system characterized by varying demands for filtered fluid, the method comprising the steps of:

controlling the filter system by a supply means for supplying filtered fluid to the process system at a flow rate generally proportional to the varying demands for filtered fluid from the process system;

constantly sensing a selected operating parameter of the process system indicative of its varying demands for filtered fluid and generating feedback data representative of the varying demands for filtered fluid by the process system; and

regulating operation of the filter system supply means by a device operable to vary supply of inlet fluid to the filter system at a flow rate determined by the feedback data provided by the selected operating parameter, whereby the filter system operates at a variable flow rate for supplying filtered fluid generally in proportion to the varying demands for filtered fluid by the process system to optimize operation of the filter system.

5,589,077

LIQUID FILTERING AND SUPPLY SYSTEM CONTROLLING RECIRCULATION RESPONSIVE TO PRESSURE DIFFERENCE ACROSS FILTER

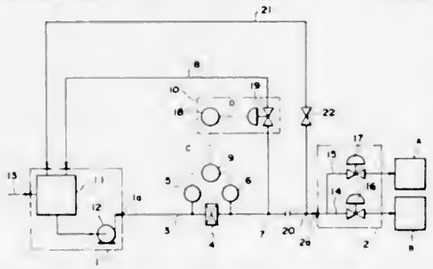
Yoji Matsuda, Ichihara; Masao Morikawa, Sodegaura, and Masaaki Toma, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 305,918, Sep. 16, 1994, abandoned. This application Nov. 16, 1994, Ser. No. 341,919

Claims priority, application Japan, Sep. 20, 1993, 5-233211; Oct. 1, 1993, 5-246637

Int. Cl.[6] B01D *37/04*

U.S. Cl. 210—741 **16 Claims**



5. A liquid supply method for removing particles in a liquid using a filter disposed in a main line having ends connecting with a liquid introducing part and a liquid supplying part and for supplying said liquid to a use point, comprising the steps of:

determining a pressure difference between a first pressure detector disposed at an upstream side of said filter, in said main line, and a second pressure detector disposed at a downstream side of said filter, in said main line; and

adjusting a flow rate through a first circulating line connecting a first diverging point disposed in said main line at a downstream side of said second pressure detector to said liquid introducing part, based on said pressure difference, and thus controlling said pressure difference.

5,589,078

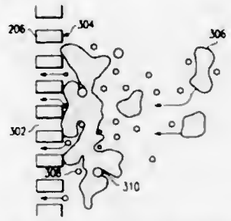
ADVANCED FILTRATION TECHNIQUE FOR FLUID PURIFICATION

Brian E. Butters, 122 Fairview Ave., St. Thomas, Ontario, Canada, and Anthony L. Powell, 10 Moreau Crescent, London, Ontario, Canada

Filed Jun. 7, 1995, Ser. No. 478,226

Int. Cl.[6] C02F *1/48*

U.S. Cl. 210—748 **22 Claims**



1. A method for recovering a decontaminated effluent after photocatalytic decontamination of a contaminated fluid, comprising:

forming a slurry by mixing a contaminated fluid with photocatalytic particles having an agglomeration property;

exciting the photocatalytic particles of the slurry to render a treated slurry that includes a decontaminated fluid and agglomerated photocatalytic particles;

directing the treated slurry into a filter unit that includes at least one separation element, each separation element having an inner surface defined by a channel extending through a substrate, each separation element having a plurality of pores which derive from the inner surface and extend through the substrate;

passing the treated slurry through a separation element under certain conditions designed to induce the agglomerated photocatalytic particles to accumulate and form a layer at or near the inner surface of the separation element; and

recovering the decontaminated fluid through the plurality of pores of the separation element.

5,589,079

CRYSTAL RECOVERY METHOD EMPLOYING A ROTARY VACUUM FILTRATION DRUM WITH VALVED HOPPER CAKE TREATMENT MEANS

David B. Park, Middleboro, Mass., and Michael F. Crawley, Maryville, Tenn., assignors to Baker Hughes Incorporated, Salt Lake City, Utah

Division of Ser. No. 197,965, Feb. 17, 1994, Pat. No. 5,470,473. This application May 17, 1995, Ser. No. 442,958

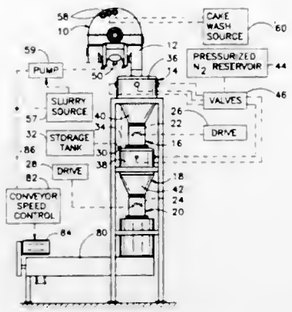
Int. Cl.[6] B01D *33/06*

U.S. Cl. 210—784 **5 Claims**

1. A method for recovering crystals from a slurry, comprising:

providing a filtration unit including a rotatably mounted cylindrical filter;

pressurizing said filtration unit;



feeding a slurry under pressure to an input of said filtration unit;

rotating said filter during the pressurizing of said filtration unit and the feeding of said slurry;

discharging, into a first hopper, crystalline material separated from said slurry by the filtration unit and caked on an outer surface of said filter, said first hopper having an outlet with a first valve unit in a closed state second hopper having an outlet with a second valve unit in a closed state;

opening said first valve unit;

upon opening of said first valve unit, transferring crystalline material from said first hopper into said second hopper, while maintaining said second valve unit closed;

upon transferring crystalline material from said first hopper into said second hopper, closing said first valve unit;

upon transfer of crystalline material from said first hopper into said second hopper, opening said second valve unit to discharge the crystalline material from said second hopper to essentially atmospheric pressure; and

removing crystalline material caked on a wall of a given one of said first hopper and said second hopper.

5,589,080

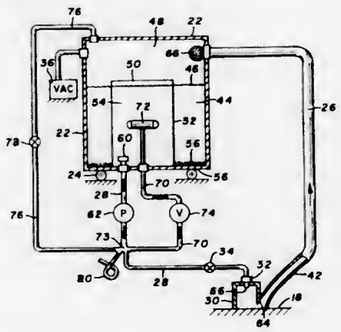
LIQUID RECYCLING SYSTEM WITH MOVING CONCENTRATED COUNTERFLOW FOR FILTER CLEARANCE

Sung K. Cho, Roseville, and Lowell H. Schiebe, Corcoran, both of Minn., assignors to CFR Corporation, New Brighton, Minn.

Filed Apr. 4, 1995, Ser. No. 416,289

Int. Cl.[6] B01D *29/66;* **A47L** *9/18*

U.S. Cl. 210—791 **22 Claims**



18. In a fluid cycling system including a reservoir for containing a liquid and means to move the liquid into and out of the reservoir, a process for maintaining a flow of the liquid through a filter contained within the reservoir and submerged in the liquid, the process comprising:

locating a filter having a liquid permeable filter wall within a reservoir, submerged within a liquid contained in the reservoir to define a chamber containing a portion of the liquid;

withdrawing some of the liquid from the chamber to a location outside of the reservoir, to promote a flow of the liquid contained in the reservoir through the filter wall and into the chamber;

supplying liquid under pressure to a spray assembly mounted inside of the chamber to spray the liquid under pressure from at least one orifice of the spray assembly onto said filter wall in a spray pattern that impinges upon a limited section of the filter wall comprising less than about fifteen percent of a surface area of the filter wall; and

while so supplying the liquid under pressure, moving said at least one orifice relative to the filter, thus to spray the filter wall over a sweep area at least six times the area of said limited section, thus tending to keep the filter wall free of contaminants at least over said sweep area;

wherein said moving of the at least one orifice comprises mounting the at least one orifice for movement in a first direction, and orienting the at least one orifice to produce a spray of the liquid in a direction counter to the first direction, whereby said at least one orifice is moved in the first direction as a reaction to said spray.

5,589,081

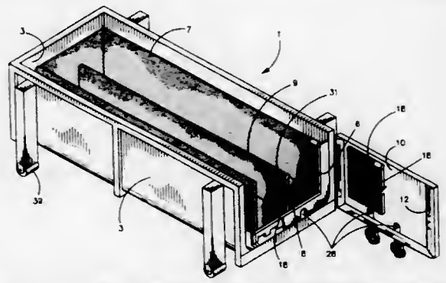
DIVIDED PHASE SEPARATOR FOR LIQUID/SOLID SEPERATION IN SLUDGE

Ronald B. Harris, 28109 Charlie Watts Rd., Livingston, La. 70754

Filed Jan. 11, 1996, Ser. No. 584,555

Int. Cl.[6] B01D *29/05*

U.S. Cl. 210—804 **33 Claims**



33. A method for offsetting the effects of blinding in a liquid-solid separator for separating liquids from target solids in a sludge comprising: a tank having walls extending upward from a bed, said bed and said walls having surfaces, said surfaces forming a sludge receiving cavity; a dividing wall extending upward from said bed; a liquid permeable filter positioned within said cavity for retaining target solids, said filter positioned to overlap said dividing wall; a first support means for supporting said filter over said bed and said walls, said support means providing a first free flow space between said filter and said bed and said walls; a second support means for supporting said filter over said dividing wall, said support means providing a second free flow space between said filter and said dividing wall; a first liquid removal means for removing liquids from said first free flow space; and a second liquid removal means for removing liquids from said second free flow space comprising:

closing first liquid removal means prior to the introduction of sludge into said sludge receiving cavity;

closing second liquid removal means prior to the introduction of sludge into said sludge receiving cavity;

introducing sludge into said sludge receiving cavity;

allowing sludge to stand and separate into two phases, a relatively solid free fluid phase and a remaining sludge phase;

opening said first liquid removal means; and

opening said second liquid removal means.

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5,589,082

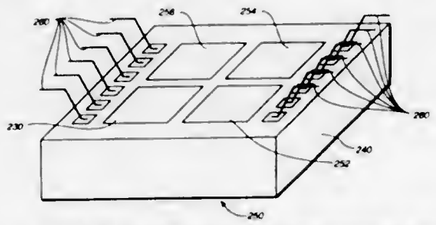
MICROELECTROMECHANICAL SIGNAL PROCESSOR FABRICATION

Liwei Lin; Clark T. Nguyen, both of Berkeley; Roger T. Howe, Lafayette, and Albert P. Pisano, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 298,233, Aug. 30, 1994, Pat. No. 5,537,083, which is a continuation of Ser. No. 990,582, Dec. 11, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,467

Int. Cl.[6] H01L *21/00*

U.S. Cl. 216—2 **8 Claims**



1. A method for fabrication of a microelectromechanical signal processor on a substrate, said method comprising the steps of:

(a) fabricating a first patterned layer on said substrate;

(b) fabricating a second patterned layer having an opening for anchoring a third patterned layer;

(c) fabricating said third patterned layer;

(d) fabricating a fourth patterned layer having an opening for anchoring a fifth patterned layer;

(e) fabricating said fifth patterned layer; and

(f) etching said fourth layer and said second layer.

5,589,083

METHOD OF MANUFACTURING MICROSTRUCTURE BY THE ANISOTROPIC ETCHING AND BONDING OF SUBSTRATES

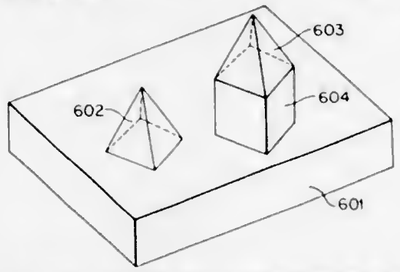
Kun-Young Ahn; Kyung-Ho Park; Kee-Soo Nam, and Sang-Won Kang, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-Shi, Rep. of Korea

Filed Nov. 22, 1994, Ser. No. 346,205

Claims priority, application Rep. of Korea, Dec. 11, 1993, 93-27344; Dec. 18, 1993, 93-28479; Dec. 18, 1993, 93-28480

Int. Cl.[6] H01L *21/00;* **B44C** *1/22*

U.S. Cl. 216—24 **17 Claims**



1. The method of manufacturing a microstructure by the anisotropic etching and bonding of substrates, comprising the following steps:

bonding a first substrate with a second substrate that has a different crystal orientation from the first substrate;

polishing the second substrate, the second substrate being thinner than the first substrate after the polishing step;

forming an etching protective mask on the first substrate;

forming a window in the etching protective mask so as to permit exposure of a region of the first substrate by using photolithography;

etching the first substrate exposed through the window so as to form nozzles that are different from each other.

5,589,084

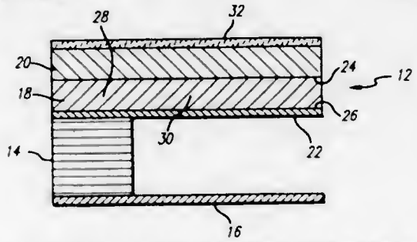
THIN FILM ACTUATED MIRROR ARRAY

Jeong B. Ji, Seoul, Rep. of Korea, and Gregory Um, Torrance, Calif., assignors to Daewoo Electronics Co. Ltd., Seoul, Rep. of Korea, and Aura Systems, Inc., El Segundo, Calif.

Division of Ser. No. 200,861, Feb. 23, 1994, Pat. No. 5,481,396. This application Jun. 7, 1995, Ser. No. 480,032

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—24 **3 Claims**



1. A method of fabricating a thin film mirror for an optical projection system comprising the steps of:

providing an active matrix substrate;

depositing a first layer to the substrate, the first layer including a first area corresponding to a pedestal member of the thin film mirror and a second sacrificial area corresponding to the remaining area of the thin film mirror area;

treating the second sacrificial area of the first layer so as to be removable;

depositing a thin film layer of metal on the first layer;

depositing a thin film layer of piezoelectric material on the thin film layer of metal;

depositing a second thin film layer of metal on the piezoelectric material layer; and

removing the second sacrificial area of the first layer.

5,589,085

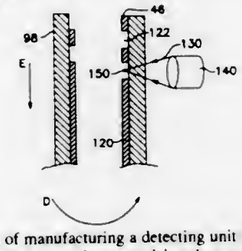
PROCESS OF MANUFACTURING A DETECTING UNIT FOR AN ELECTROLYTIC CELL WITH THIN FILM ELECTRODES

Jacob Mettes, New Hope, Pa., assignor to Meeco, Incorporated, Warrington, Pa.

Filed Aug. 4, 1995, Ser. No. 511,531

Int. Cl.[6] C23F *1/02;* **G01N** *27/26*

U.S. Cl. 216—65 **22 Claims**



1. A process of manufacturing a detecting unit for an electrolytic cell with thin film electrodes comprising the steps of:

(a) providing a long, narrow transparent, hollow glass tube having an inside surface, an outside surface, and an end with a rim;

(b) depositing a thin, noble metal film on the inside surface of the hollow glass tube;

(c) directing a beam from a light source through the hollow glass tube to remove first and second portions of the noble metal film from the inside surface of the hollow glass tube and create first and second thin film electrodes separated by spacer areas; and

(d) depositing an hygroscopic film on the entire inside surface of the hollow glass tube, covering completely the first and second electrodes and the spacer areas.

5,589,086

METHOD AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING WITH CONTROL OF A SERVOMECHANISM BY A POSITION LOOP AND A SPEED LOOP

Kiyoshi Sawada, Sunto-gun, and Shun'ichi Odaka, Oshino-mura, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

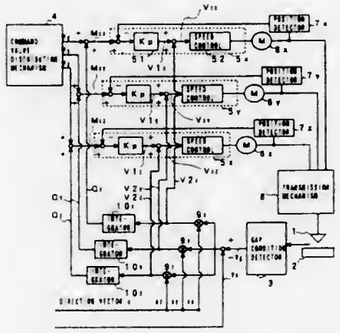
PCT No. PCT/JP94/00148, § 371 Date Oct. 5, 1994, § 102(e) Date Oct. 5, 1994, PCT Pub. No. WO94/17948, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 2, 1994, Ser. No. 313,278

Claims priority, application Japan, Feb. 5, 1993, 5-040717

Int. Cl.[6] B23H *1/02;7/18;7/20*

U.S. Cl. 219—69.16 **17 Claims**



1. A method for controlling electric discharge machining comprising:

detecting an electric discharge machining condition of a gap between a tool electrode and a workpiece;

producing speed commands for input into a speed loop from a deviation between the detected value of said electric discharge machining condition and a target value of said electric discharge machining condition;

correcting said speed commands with a position loop based upon a position deviation between a target position of said tool electrode and an actual position of said tool electrode;

driving a servomechanism in response to the corrected speed commands to relatively move said tool electrode with respect to said workpiece so that a detected value of said electric discharge machining condition agrees with a target value of said electric discharge machining condition.

5,589,087

PROCESS FOR PRODUCING A STEEL MOLD FOR CONCRETE PAVING BLOCKS WITH SPACERS

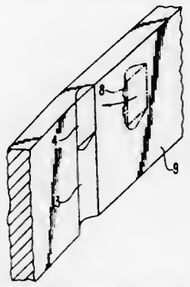
Guenter Burger, Allmendingen, Germany, assignor to Rampf Formen GmbH, Allmendingen, Germany

Filed Mar. 2, 1995, Ser. No. 397,672

Claims priority, application Germany, Mar. 8, 1994, 44 07 698.3

Int. Cl.[6] B23K *11/14;* **B29C** *33/40*

U.S. Cl. 219—93 **9 Claims**



1. A method of producing a steel mold used for molding concrete paving blocks having spacers, comprising the steps of:

flame cutting a steel plate using a flame-cutting jet to form at least one mold chamber;

guiding the flame-cutting jet to form at least one groove in a wall of the mold chamber, with the groove defining a cross-section of a spacer; and

filling in an upper portion of the groove, by performing the following steps:

providing a closure platelet having a cross-section corresponding essentially to a cross-section of the groove, and having at least one welding projection formed on a side thereof;

placing the closure platelet in the groove with the welding projection projecting into the groove; and

projection welding the closure platelet into the groove.

5,589,088

METHOD OF REGULATING DC CURRENT IN RESISTANCE WELDERS

Reno C. Boilard, Windsor, Canada, assignor to Medar, Inc., Farmington Hills, Mich.

Filed Jun. 20, 1995, Ser. No. 493,803

Int. Cl.[6] B23K *11/24*

U.S. Cl. 219—110 **8 Claims**

1. A method of controlling a resistance welder of the type having a transformer provided with a primary coupled through a switch to a source of alternating current electrical power, a secondary, a weld controller for controlling the switch and means for delivering DC current from the transformer secondary to a workpiece to be welded, comprising the steps of:

(A) storing in a look up table memory of the controller a set of data correlating a set of firing delay parameters with a set of DC current values representing the percentage of maximum DC current that is available to be delivered to the workpiece at a given power factor for the weld circuit, wherein the stored set of DC current values is a nonlinear function of the actual values of the DC current delivered to the workpiece;

(B) retrieving from the lookup table memory a firing delay parameter;

(C) controlling the switch in accordance with the firing delay parameter retrieved in step (B) to deliver a pulse of weld energy to the workpiece;

(D) incrementing a counter to reflect the delivery of the weld energy pulse; and,

(E) repeating steps (C) and (D) until the count of the counter corresponds to a prescribed number of weld cycles.

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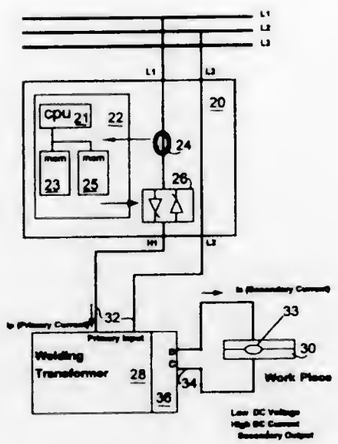


5,589,089

YAG LASER MACHINE WITH SAFETY SYSTEM FOR BEAM PATH ADJUSTMENT

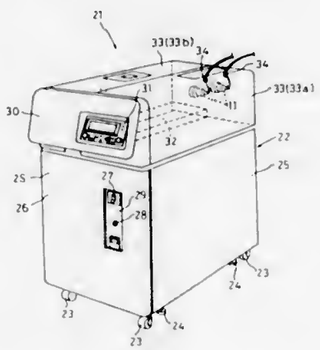
Akira Uesugi, Noda, Japan, assignor to Miyachi Technos Corporation, Chiba, Japan

Filed Oct. 14, 1994, Ser. No. 323,521

Claims priority, application Japan, Oct. 19, 1993, 5-261100

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.6 **2 Claims**



1. YAG laser processing machine characterized by a YAG laser generator; a guide beam generator for generating a visible guide beam used for optical axis adjustment of said YAG laser generator; detachable means for preventing the reflected beam portion of the laser beam from leakage outside the machine; a safety means interlocked with detaching movement of said detachable means for holding said YAG laser generator in its stopped state; detachable guide beam visual inspection means, comprising a fiber scope, mounted for optical axis adjustment operation for visual inspection of said guide beam; a safety means interlocked with the mounting movement of said detachable guide beam visual inspection means for holding said YAG laser generator in its stopped state when the inspection means is operably attached to the machine.

5,589,090

LASER CUTTING APPARATUS WITH MEANS FOR MEASURING CUTTING GROOVE WIDTH

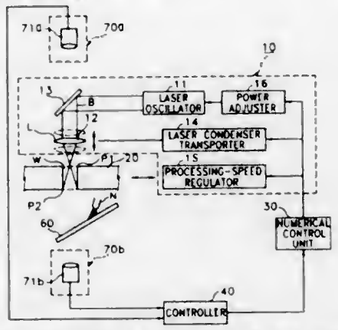
Byung-Jun Song, 1209-1404, Jukong Apt., Chulsan-dong, Kwangmyung-city, Kyungki-do, Rep. of Korea

Filed Jan. 23, 1995, Ser. No. 376,366

Claims priority, application Rep. of Korea, Jan. 31, 1994, 94-1766; Feb. 16, 1994, 94-2713

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.62 **15 Claims**



1. A laser cutting apparatus including a laser oscillator for generating a laser beam and a laser condenser lens for condensing said laser beam from said laser oscillator to make a cutting groove of predetermined width into an object being processed, said laser cutting apparatus comprising:

means for adjusting distance between said object and said laser condenser lens for adjusting the width of said laser beam irradiating upon said object;

relative-speed regulating means for controlling the relative speed of said object with respect to said laser beam to regulate the irradiating time of said laser beam upon said object;

cutting-width measuring means for measuring of an upper portion and a lower portion of said cutting groove; and

controlling means for comparing the upper cutting width and the lower cutting width measured by said cutting-width measuring means, of said cutting groove with a standard dimension, and controlling said distance adjusting means and said relative-speed regulating means in accordance with the result of comparison.

5,589,091

GLOW PLUG WITH PRESTRESSED CONTACT SURFACES

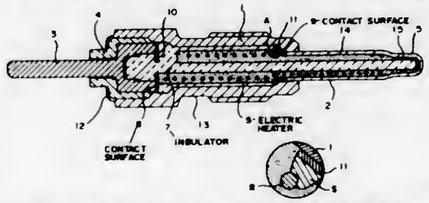
Helmut Müller, Besigheim-Ottmarsheim, Germany, assignor to BERU Ruprecht GmbH & Co. KG, Germany

Filed Oct. 17, 1994, Ser. No. 325,950

Claims priority, application Germany, Oct. 15, 1993, 43 35 292.8

Int. Cl.[6] F23Q *7/00;* **H05B** *3/10*

U.S. Cl. 219—270 **19 Claims**



1. Glow plug comprising a hollow body in which a ceramic heating rod, having a rod body formed entirely of sintered ceramic material, is disposed with the heating rod axially projecting from a first end of the hollow body; wherein a sintered-in heating element is embedded within the sintered ceramic material of the unitary rod body so as to be fully enclosed by said sintered ceramic material, and wherein the sintered-in heating element is directly connected to power supply terminals by pressure contact therewith via contact surfaces integrally joined with the ceramic material of the rod body at an external surface of the rod body.

5,589,092

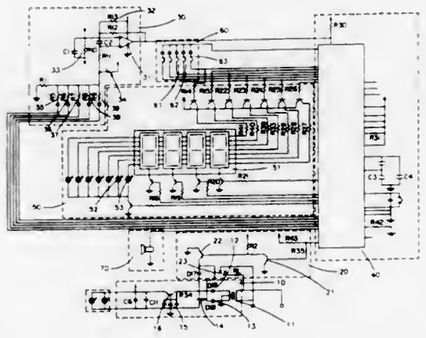
CONTROL CIRCUIT FOR CONTROLLING THE OPERATION OF A MULTIPURPOSE ELECTRONIC COOKER

Kwei-Tang Chang, No. 14, Lane 54, Luong Chuan St., Panchiao City, Taipei Hsien, Taiwan

Filed Mar. 17, 1995, Ser. No. 405,910

Int. Cl.[6] H05B *1/02*

U.S. Cl. 219—506 **6 Claims**



1. A multipurpose electronic cooker control circuit, comprising:

a rectifier filter circuit;

an electronic switch for ON/OFF control of an electric heater;

a comparator circuit for temperature control;

a single chip main control unit;

a time and temperature display unit;

a keyboard control circuit;

a buzzer;

wherein the rectifier filter circuit has first and second output terminals, the first output terminal of said rectifier filter circuit is respectively connected to first input terminals of said electronic switch, said comparator circuit, said time and temperature display unit, said keyboard control circuit, and said buzzer, the second output terminal of said rectifier filter circuit is connected to a first input terminal of the single chip main control unit;

wherein the single chip main control unit has first, second, third, and fourth output terminals, the first output terminal of said single chip main control unit is connected to a second input terminal of said electronic switch, the second output terminal of said single chip main control unit is connected to a second input terminal of said comparator circuit, the third output terminal of said single chip main control unit is connected to a second input terminal of said time and temperature display unit, the fourth output terminal of said single main control unit is connected to an input terminal of said buzzer;

wherein an output terminal of said comparator circuit is connected to a second input terminal of said single chip main control unit; and

wherein an output terminal of said keyboard control circuit is connected to a third input terminal of said single chip main control unit.

5,589,093

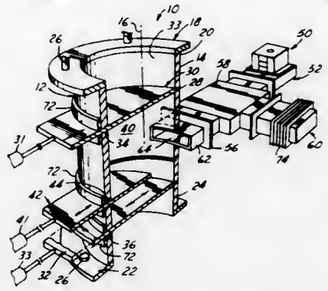
MICROWAVE HEATING CHAMBER FOR VENDING MACHINES

Jey-Cherng Chen, Hsin Chu, Taiwan, assignor to Electronics Research & Service Organization, Hsinchu, Taiwan

Filed Jul. 20, 1995, Ser. No. 504,731

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—679 **18 Claims**



1. A microwave heating chamber for use in a vending machine comprising:

a cylindrically shaped chamber having a chamber wall and a longitudinal axis, said chamber is equipped with an upper mounting flange at its upper extremity and a lower mounting flange at its lower extremity, said upper mounting flange being adapted to receive an object transported from a storage compartment, said lower mounting flange being adapted to deliver said object to a discharge chute of said vending machine,

a retractable upper end plate for sealingly engaging the inside peripheral area of said chamber when positioned perpendicular to the longitudinal axis of said chamber, said upper end plate being controlled and positioned by a first mounting means and a first retracting means through a first slot opening in the chamber wall of said heating chamber for moving horizontally into and out of said chamber such that when said plate is in a fully extended position, it substantially seals off the upper end of said chamber,

a retractable lower end plate for sealingly engaging the inside peripheral area of said chamber when positioned perpendicular to the longitudinal axis of said chamber, said lower end plate being controlled and positioned by a second mounting means and a second retracting means through a second slot opening in the chamber wall of said chamber for moving horizontally into and out of said chamber such that when said lower end plate is in a fully extended position, it substantially seals off the lower end of said chamber and forms a substantially sealed chamber cavity when said upper end plate is also in a fully extended position,

said chamber wall and said retractable upper end plate and lower end plate being made of a material that is substantially not transmissive or absorptive to microwave energy,

a retractable object holding plate for supporting an object to be heated by microwave energy positioned parallel to said upper end plate and said lower end plate, said object holding plate being controlled and positioned by a third mounting means and retracting means through a third slot opening in the chamber wall of said chamber such that when said holding plate is in a fully extended position, it holds the object to be heated at a position of maximum microwave energy,

said retractable object holding plate being made of a material that is transmissive but not absorptive to microwave energy,

a microwave generator sealingly engaging the chamber wall of said heating chamber through a mounting means and is in microwave transmissible communication with the chamber cavity of said chamber to supply microwave energy, and

a control means for controlling said first, second and third retracting means and said microwave generator to enable the supply of microwave energy to the chamber cavity for heating an object on demand.

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5,589,094

MICROWAVE OVEN EMPLOYING THERMOPILE TYPE SENSOR

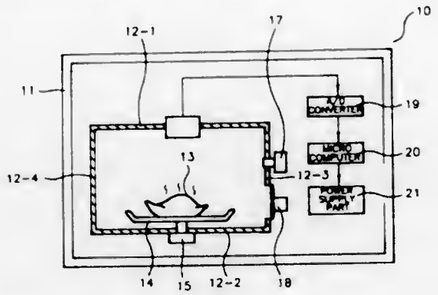
Jong U. Bu, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 20, 1995, Ser. No. 406,507

Claims priority, application Rep. of Korea, Mar. 18, 1994, 5485/1994

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—711 **10 Claims**



1. A microwave oven comprising;

an outer case;

a cavity having an upper and a lower case facing each other, and a right and a left side cases facing each other, and an opening in the upper case;

a table mounted on the lower case opposite the opening, wherein the table is adapted for placing food for cooking thereon;

a thermopile type sensor mounted in the opening of the cavity for sensing a radiation temperature of food placed on the table using an absorption rate difference between a black body on a membrane of the thermopile sensor and a non-black body on radiation heating;

a magnetron device mounted on one of the side cases of the cavity for generating microwaves for the cavity;

a cooling fan mounted on the side case of the cavity under the magnetron device for cooling the air in the cavity;

an A/D converter for A/D converting an output value of the thermopile type sensor;

a microcomputer for receiving an output of the A/D converter and controlling automatic cooking according to the output of the A/D converter; and

a power supply part for receiving the output of the microcomputer and operating the magnetron device and the cooling fan to make an automatic cooking of the food placed on the table possible according to the output of the microcomputer.

5,589,095

COOLANT/LUBRICANT FOR MACHINING OPERATIONS

Lin-Sen Yuan, Westlake Village, Calif., and Lu Yuan, Shanghai, China, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 30, 1994, Ser. No. 315,787

Int. Cl.[6] C10M *173/02*

U.S. Cl. 508—168 **10 Claims**

1. A high-load, high-stress machining coolant and lubricant composition, consisting essentially of a suspension of:

(a) about 8 to 15 wt % molybdenum disulfide;

(b) about 2 to 6.6 wt % of a sodium fatty-acidulate soap;

(c) about 6 to 12 wt % liquid polytetrafluoroethylene suspension; and

(d) about 66.4 to 84 wt % water, said water being in addition to such water as is intrinsically associated with said sodium fatty-acidulate soap and said liquid polytetrafluoroethylene suspension.

5,589,096

MAGNETIC MATERIAL FOR HIGH FREQUENCIES

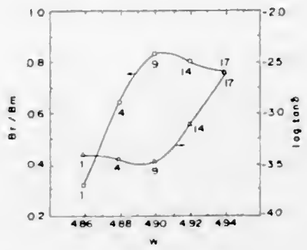
Takehiro Konoike, Ashiya; Hiroshi Marusawa, Neyagawa; Hiroshi Takagi, and Kunisaburo Tomono, both of Ohtsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 20, 1994, Ser. No. 277,909

Claims priority, application Japan, Jul. 20, 1993, 5-179150; Jun. 29, 1994, 6-147958

Int. Cl.[6] C04B *35/44*

U.S. Cl. 252—62.57 **4 Claims**



1. A magnetic material for high frequencies consisting essentially of a main component which contains Sn and Al and has a composition expressed by the general formula:

$$(Y_{3-x-z/2}Ca_{x+z/2})(Fe_{w-x-y-z}Sn_yAl_zV_z)O_{4.x+1.5w}$$

where x, y, z and w take respective values within the following ranges: $0.10 \leqq x \leqq 0.60$, $0.00 < y \leqq 0.20$, $0.20 \leqq z \leqq 0.60$, $4.88 \leqq w \leqq 4.92$, and an additional component of CeO_2 incorporated therein in an amount of not less than 0.1 percent by weight but not more than 0.5 percent by weight.

5,589,097

METHOD FOR PREPARING MAGNETITE MAGNETIC POWDER

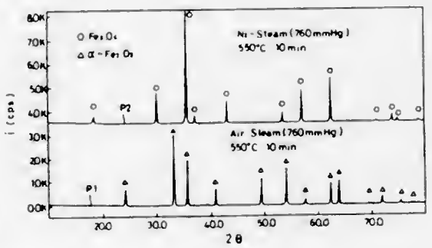
Yoshito Nihira, Chiba, Japan; Haoren Zhuang, Cincinati, Ohio, and Takeshi Nomura, Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,865

Claims priority, application Japan, Dec. 24, 1993, 5-347945; Dec. 27, 1993, 5-353918; May 25, 1994, 6-135004

Int. Cl.[6] C04B *35/26*

U.S. Cl. 252—62.59 **23 Claims**



1. A method for preparing a magnetite magnetic powder comprising the steps of:

using ferrous chloride as a starting material, and

roasting the starting material in a steam-containing atmosphere consisting essentially of a non-oxidizing gas and steam for pyrolysis thereof, thereby forming a magnetite magnetic powder having a saturation magnetization σs of 82 to 92 emu/g and a magnetite phase content of at least 90% by weight.

5,589,098

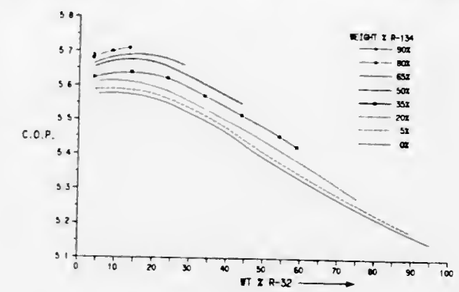
COMPOSITIONS OF DIFLUOROMETHANE AND TETRAFLUOROETHANE

Mark B. Shiflett, Newark, Del., and Donald B. Bivens, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 143,761, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 963,310, Oct. 16, 1992, Pat. No. 5,290,466, which is a continuation-in-part of Ser. No. 787,872, Oct. 31, 1991, abandoned, and a continuation of Ser. No. 871,673, Apr. 21, 1992, abandoned. This application May 8, 1995, Ser. No. 436,777

Int. Cl.[6] C09K *5/04*

U.S. Cl. 252—67 **6 Claims**



1. A mixture consisting essentially of a substantially constant boiling, near-azeotropic composition consisting of 1–6 weight percent difluoromethane and 94–9 weight percent 1,1,2,2-tetrafluoroethane, wherein when the temperature is adjusted to about 25° C., the composition boils at a vapor pressure of about 78–91 psia, and wherein when 50 weight percent of the composition is evaporated, the vapor pressure of the composition changes by 10 percent or less.

2. A substantially constant boiling, near-azeotropic composition consisting essentially of difluoromethane, 1,1,2,2-tetrafluoroethane and 1,1,1,2-tetrafluoroethane, in the following proportions at about 25° C.: 4 weight percent difluoromethane, 1–95 weight percent 1,1,2,2-tetrafluoroethane and 1–95 weight percent 1,1,1,2-tetrafluoroethane, said composition boiling at a vapor pressure of about 86.0–107.9 psia; 3 weight percent difluoromethane, 1–96 weight percent 1,1,2,2-tetrafluoroethane and 1–96 weight percent 1,1,1,2-tetrafluoroethane, said composition boiling at a vapor pressure of about 83.6–105.5 psia; 2 weight percent difluoromethane, 1–97 weight percent 1,1,2,2-tetrafluoroethane and 1–97 weight percent 1,1,1,2-tetrafluoroethane, said composition boiling at a vapor pressure of about 81.2–103.0 psia; or 1 weight percent difluoromethane, 1–98 weight percent 1,1,2,2-tetrafluoroethane and 1–98 weight percent 1,1,1,2-tetrafluoroethane, said composition boiling at a vapor pressure of about 78.8–100.6 psia, wherein when 50 weight percent of the composition is evaporated, the vapor pressure of the composition changes by 10 percent or less.

5,589,099

LOW FOAMING RINSE AGENTS COMPRISING ETHYLENE OXIDE/PROPYLENE OXIDE BLOCK COPOLYMER

Burton M. Baum, Mendota Heights, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Filed Apr. 20, 1993, Ser. No. 49,973

Int. Cl.[6] C11D *1/66*

U.S. Cl. 510—514 **19 Claims**

1. A food grade rinse agent composition comprising approved food additive ingredients, suitable for dilution to form an aqueous rinse, the composition comprising:

(a) about 5 to 40 wt-% of a nonionic block copolymer composition, comprising ethylene oxide and propylene oxide, having a molecular weight between 10,000 and 15,000 and a cloud point, measured using a 1 wt-% aqueous solution, greater than 100 ° C.;

(b) about 0.2 to 25 wt-% of a food additive defoamer composition; and

(c) up to about 95 wt-% of a water soluble diluent composition.

5,589,100

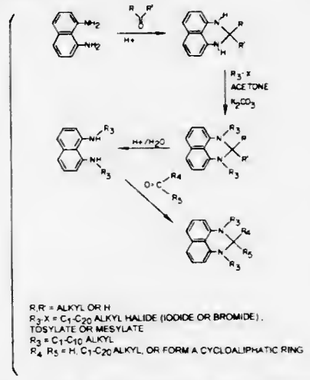
DICHROIC AZO DYES

Robert P. Grasso; Michael K. O'Brien, both of Wilmington, Del., and Paul J. Shannon, Exton, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 218,001, Mar. 25, 1994, abandoned, which is a division of Ser. No. 535,268, Jun. 8, 1990, Pat. No. 5,326,865. This application Mar. 20, 1996, Ser. No. 618,937

Int. Cl.[6] C09K *19/00;19/52*

U.S. Cl. 252—299.01 **8 Claims**



1. A liquid crystal display comprising two substrates having disposed there between a guest-host composition comprising a liquid crystal host solvent and, as the guest, an arylazo or poly(arylazo) dichroic dye having one to five arylazo groups wherein the aryl radicals are selected from the group consisting of naphthyl, anthracyl and phenyl radicals, wherein at least one core radical is selected from a naphthyl or anthracyl radical and having at least one 2,3-dihydro-1, 3-dialkyl perimidine substituent.

5,589,101

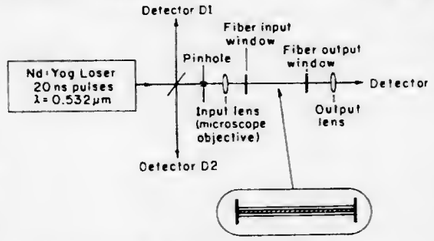
LIQUID CRYSTAL FIBER ARRAY FOR OPTICAL LIMITING OF LASER PULSES AND FOR EYE/SENSOR PROTECTION

Iam-Choon Khoo, State College, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Apr. 5, 1995, Ser. No. 417,332

Int. Cl.[6] C09K *19/00;* **G02F** *1/13;* **G02B** *6/00*

U.S. Cl. 252—299.01 **11 Claims**



1. A liquid crystal fiber array comprising:

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a unitary body having incident and transmitting faces and including a plurality of capillary passages extending between said incident and transmitting faces;

a liquid phase liquid crystal material positioned in each of said capillary passages, said capillary passages having diameters in a range of about 2 microns to 500 microns; and

optically transparent closures positioned on said incident and transmitting faces for retaining said liquid phase liquid crystal material within said capillary passages, said liquid crystal material exhibiting an optical limiting effect upon incidence of high intensity optical energy.

5,589,102

BENZENE DERIVATIVES, AND LIQUID-CRYSTALLINE MEDIUM

Ekkehard Bartmann, Erzhausen, and Kazuaki Tarumi, Seebeim, both of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Germany

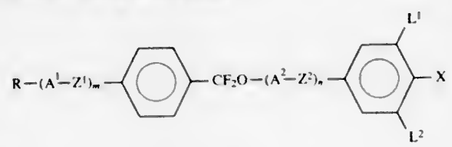
Filed Sep. 5, 1995, Ser. No. 523,240

Claims priority, application Germany, Sep. 6, 1994, 44 31 737.9

Int. Cl.[6] **C09K** *19/52;19/30;* **C07C** *25/13;* **G02F** *1/13*

U.S. Cl. 252—299.01 **17 Claims**

1. A benzene derivative of formula I



wherein

R is an alkyl or alkenyl radical having 1 to 15 carbon atoms which is optionally monosubstituted by CN or CF_3 or optionally at least monosubstituted by halogen, one or more CH_2 groups in these radicals optionally independently replaced by —O—, —S—,

—CO—, —CO—O—, —O—CO— or —O—CO—O— that O atoms are not linked directly to one another,

A^1 and A^2 are each independently

(a) a trans-1,4-cyclohexylene radical in which one or more non-adjacent CH_2 groups is optionally replaced by —O— and/or —S—,

(b) a 1,4-phenylene radical optionally monosubstituted or disubstituted by F or CN, and in which one or two CH groups is optionally replaced by N,

(c) 1,4-cyclohexenylene,

(d) a 1,4-bicyclo[2.2.2]octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydro-naphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthelene- 2,6-diyl radical, where the radicals (a) to (c) are optionally monosubstituted or polysubstituted by CN or fluorine,

Z^1 and Z^2 are each independently —CO—O—, —O—CO—, —CH_2O—, —OCH_2—, —CH_2CH_2—, —CH=CH, —C≡C— or a single bond, or one of Z^1 and Z^2 is alternatively— $(CH_2)_4$— or —CH=CH=CH_2CH_2—,

L^1 and L^2 are each independently H or F,

m and n are each independently 0 or 1, and

X is halogenated C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{2-6}-alkenyl, F or Cl.

5,589,103

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME, AND LIQUID CRYSTAL DEVICE USING SAME

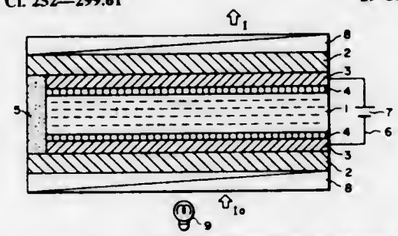
Yoko Yamada, Isehara; Takao Takiguchi, Tokyo; Takashi Iwaki, Machida; Takeshi Togano, Yokohama; Shinichi Nakamura, Isehara, and Ikuo Nakazawa, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1994, Ser. No. 177,144

Claims priority, application Japan, Jan. 8, 1993, 5-001974; Dec. 14, 1993, 5-312924

Int. Cl.[6] **C09K** *19/34;19/32;* **C07D** *239/02;* **G02F** *1/13*

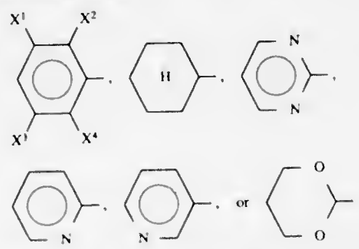
U.S. Cl. 252—299.61 **29 Claims**



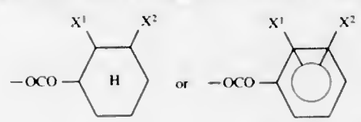
1. A mesomorphic compound represented by the following formula (I):

R^1—A—R^2

wherein R^1 and R^2 independently denote Q—Y^1—$(CH_2)_m$—Y^2— or R^3, at least one of R^1 and R^2 being Q—Y^1—$(CH_2)_m$—Y^2— wherein Q denotes



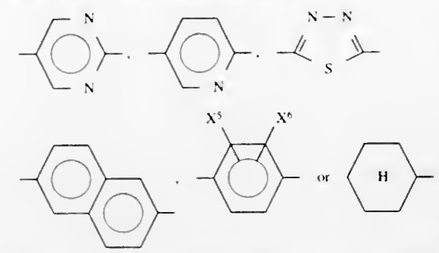
where X^1, X^2, X^3, X^4 independently denote H, F, CH_3 or CF_3; Y^1 denotes a single bond, —OCH_2—, —COO— or —OCO—; Y^2 denotes a single bond, —CH_2O—, —COO— or —OCO—; m is an integer of 3–16; and R^3 is H, F, CF_3,



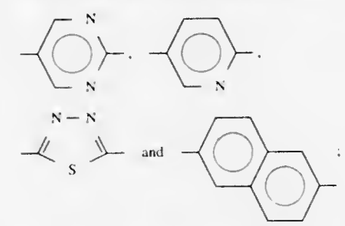
a linear or branched alkyl group having 1–18 carbon atoms capable of including at least one —CH_2— group which can be replaced with —O—, —S—, —CO—, —CH=CH—, —C≡C—, or

provided that heteroatoms are not adjacent to each other, and capable of including at least one H which can be replaced with F; or a cyclized alkyl group having 1–11 carbon atoms capable of including at least one —CH_2— group which can be replaced with —O—, —S—, —CO—, or —CH=CH—, provided that heteroatoms are not adjacent to each other and capable of including at least one H which can be replaced with F; and

A denotes —A^1—Z—A^2— or —A^1—A^2—Z—A^3— wherein A^1, A^2, and A^3 independently denote



where X^5 and X^6 independently denote H, F, CH_3 or CF_3, at least one of A^1, A^2 and A^3 being any one of



and Z denotes a single bond, —C≡C—, —CH=CH—, —COO—, —OCO—, —COS— or —CH_2O—.

5,589,104

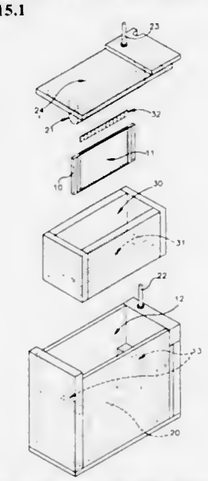
ELECTROPHORESIS SEPARATION GEL AND A METHOD FOR PREPARING AN ELECTROPHORESIS SEPARATION GEL

Gregory S. Bambeck, 1890 Georgetown Rd., Hudson, Ohio 44236

Filed Dec. 30, 1993, Ser. No. 177,271

Int. Cl.[6] **B01J** *13/00;* **C25B** *1/00*

U.S. Cl. 252—315.1 **8 Claims**



1. A gel for use in an electrophoresis separation comprising:

a plurality of gradients within said gel;

each said gradient comprising a polyacrylamide matrix and a buffer;

wherein said polyacrylamide of one said gradient has a different and preselected chain length as compared to at least one other said gradient;

wherein said polyacrylamide matrix is a bi-functionally cross-linked acrylamide; and said buffer has a buffering capacity pH of from about 7.5 to about 9.5.

5,589,105

HETEROGENEOUS POLYMERIZATION IN CARBON DIOXIDE

Joseph M. DeSimone; Elise E. Maury, both of Chapel Hill; James R. Combes, Carboro, and Yusuf Z. Menceloglu, Chapel Hill, all of N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Division of Ser. No. 378,550, Jan. 25, 1995, Pat. No. 5,506,317, which is a division of Ser. No. 299,516, Sep. 1, 1994, Pat. No. 5,451,633, which is a division of Ser. No. 99,905, Jul. 30, 1993, Pat. No. 5,312,882. This application May 18, 1995, Ser. No. 443,478

Int. Cl.[6] **B01F** *17/00;1/00*

U.S. Cl. 252—351 **22 Claims**

1. A mixture comprising carbon dioxide and a surfactant, wherein said surfactant comprises a carbon dioxide soluble segment and a CO_2-phobic group covalently linked to said carbon dioxide soluble segment, wherein said carbon dioxide soluble segment further comprises a fluoropolymer and wherein said surfactant is a copolymer selected from the group consisting of a graft copolymer and a block copolymer.

5,589,106

CARBON STEEL CORROSION INHIBITORS

Sang-Hea Shim, Naperville; Dennis P. Bakalik, Woodridge; Donald A. Johnson, Batavia; Bo Yang, and Frank F. Lu, both of Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Feb. 14, 1995, Ser. No. 388,546

Int. Cl.[6] **C23F** *11/18;11/173*

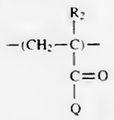
U.S. Cl. 252—387 **11 Claims**

1. A method for the control of corrosion and scale on the mild steel surfaces of an industrial cooling water system which comprises maintaining in the cooling water system:

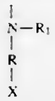
a. 5–70 ppm by weight hydroxycarboxylic acid;

b. 10–100 ppm by weight of a water soluble silicate salt; and

c. 0–50 ppm by weight of a water soluble polymeric dispersant having the formula:.



wherein Q is selected from the group consisting of OY, wherein Y is H, alkali metal or ammonium, or the group:



wherein "R_2" is hydrogen or methyl, "R_1" is hydrogen or alkyl and R is alkylene or phenylene, and "X" is sulfonate, phosphonate(poly)hydroxyl, (poly)carboxyl or carbonyl and combinations thereof, said polymer having a molecular weight of from 7,000–100,000.

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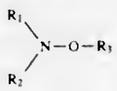
5,589,107
METHOD AND COMPOSITION FOR INHIBITING CORROSION

Clarence Scheurman, III, Westlake, Ohio, assignor to Applied Specialties, Inc., Avon Lake, Ohio

Filed Aug. 15, 1994, Ser. No. 291,589
Int. Cl.[6] C23F *11/14;15/00;* **C23C** *22/00*
U.S. Cl. 252—392 **10 Claims**

1. A composition which is useful for inhibiting corrosion of ferrous metal surfaces in an aqueous system comprising a first component and a second component, said first component being selected from the group consisting of carbohydrazide, water-soluble salts of carbohydrazide, hydrazine, water-soluble salts of hydrazine, and mixtures of any of the foregoing, said second component being selected from the group consisting of certain hydroxylamine compounds or mixtures thereof, said certain hydroxylamine compounds having the formula

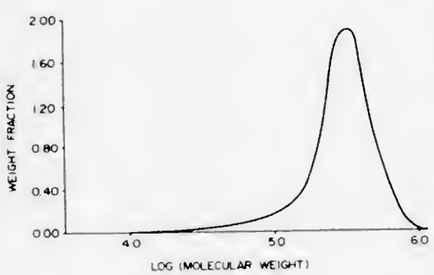


where R_1, R_2, and R_3 are either the same or different and are selected from the group consisting of hydrogen and lower alkyl containing 1 to about 6 carbon atoms, or a water-soluble salt thereof; the weight ratio of the first component to the second component being a corrosion inhibiting ratio between about 4:1 and about 1:4.

5,589,108
SOLUBLE ALKOXY-GROUP SUBSTITUTED AMINOBENZENESULFONIC ACID ANILINE CONDUCTING POLYMERS

Shigeru Shimizu; Takashi Saitoh; Masashi Uzawa, and Yasuyuki Takayanagi, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,577
Claims priority, application Japan, Dec. 29, 1993, 5-353698; Apr. 4, 1994, 6-089091; Jul. 13, 1994, 6-183882; Aug. 1, 1994, 6-199051
Int. Cl.[6] H01B *1/00;1/12*
U.S. Cl. 252—500 **14 Claims**

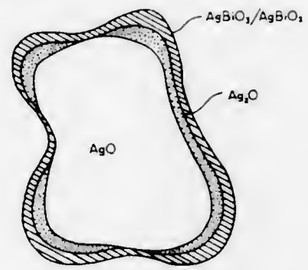


1. An aniline conducting polymer comprising, as a repeating unit, at least one member selected from the group consisting of an alkoxy group-substituted aminobenzenesulfonic acid, an alkali metal salt of alkoxy group-substituted aminobenzenesulfonic acid, an ammonium salt of alkoxy group-substituted aminobenzenesulfonic acid and a substituted ammonium salt of alkoxy group-substituted aminobenzenesulfonic acid in an amount of about 100%, and is a solid having a weight average molecular weight of about 1900 or more at room temperature and being soluble in acidic, basic and neutral aqueous solutions and organic solvents.

5,589,109
METHOD FOR PRODUCING A CATHODE MATERIAL CONTAINING SILVER AND BISMUTH

Joseph L. Passaniti, Fitchburg; El-Sayed A. Megahed, Madison, both of Wis., and Nuri A. Zreiba, Tripoli, Libyan Arab Jamahiriya, assignors to Rayovac Corporation, Madison, Wis.

Division of Ser. No. 75,889, Jun. 14, 1993, Pat. No. 5,389,469. This application Feb. 10, 1995, Ser. No. 387,296
Int. Cl.[6] H01B *1/00;* **C01G** *5/00;29/00*
U.S. Cl. 252—518 **9 Claims**



1. A method for producing a cathode material for use in an electrochemical cell, said method comprising the steps of:

(a) reacting together a reaction mixture, at a temperature between 40 degrees C. and the boiling point of said reaction mixture, for at least two hours, thereby obtaining a solid reaction product, the reaction taking place under reducing conditions, said reaction mixture comprising (i) an aqueous alkaline reaction medium, (ii) AgO comprising particles having a size of about 16 to about 62 microns, and (iii) a bismuth containing moiety selected from the group consisting of bismuth, a mixture of bismuth and sulfur, bismuth oxide, bismuth sulfate, bismuth sulfite, bismuth sulfide, and bismuth nitrate, said bismuth containing moiety comprising between about five percent and about fifteen percent by weight of the combination of said AgO and said moiety; and

(b) recovering, as said cathode material, the solid reaction product so produced.

5,589,110
CONTAINER FOR LIQUID METAL ORGANIC COMPOUND

Takashi Motoda; Shoichi Karakida; Nobuaki Kaneno, and Shigeki Kageyama, all of c/o Mitsubishi Denki Kabushiki Kaisha Hikari Micro-ha Device Kenkyusho, 1 Mizuhara 4-chome, Itami-shi, Hyogo 664, Japan

Division of Ser. No. 131,529, Oct. 4, 1993, Pat. No. 5,496,408. This application Sep. 25, 1995, Ser. No. 533,462
Claims priority, application Japan, Nov. 20, 1992, 4-335049; Feb. 12, 1993, 5-023121; Mar. 30, 1993, 5-071381
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—61 **2 Claims**

1. A metal organic compound container apparatus for containing a liquid metal organic compound, receiving a carrier gas, and producing a carrier gas stream saturated with vapor of the metal organic compound comprising:

a container for containing a liquid metal organic compound;

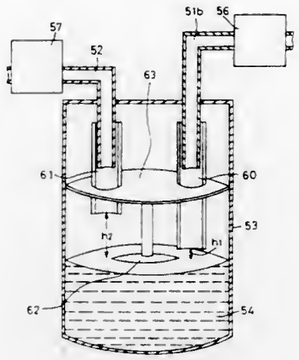
an inlet pipe for introducing a carrier gas into said container;

a first flow rate controller connected to said inlet pipe for controlling carrier gas flow into said inlet pipe;

an exhaust pipe for exhausting the carrier from said container;

a second flow rate controller connected to said exhaust pipe for controlling flow through said exhaust pipe; and

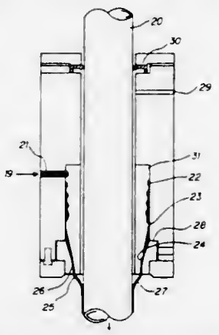
adjusting pipes slidably provided at respective ends of said inlet pipe and said exhaust pipe for positioning of the inlet and the exhaust pipe above and spaced from a surface of a metal organic compound in said container.



5,589,111
POLYIMIDE PRECURSOR COMPOSITION FOR EXTRUSION MOLDING OF POLYIMIDE, PROCESS FOR PREPARING IT, AND PROCESS FOR PREPARING MOLDED ARTICLES OF POLYIMIDE

Hiroshi Haruta, and Takehiko Takahashi, both of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 11, 1995, Ser. No. 439,142
Claims priority, application Japan, May 13, 1994, 6-124150
Int. Cl.[6] B29B *9/10;* **B29C** *47/88*
U.S. Cl. 264—8 **19 Claims**



1. A polyimide precursor composition for extrusion molding of a polyimide which comprises 30 to 45% by weight of a polyimide precursor, 0.1 to 5% by weight of a poor solvent having a low solubility for the polyimide precursor, and 35 to 69.9% by weight of a good solvent having a high solubility for the polyimide precursor.

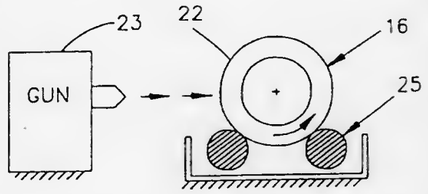
3. A process for preparing a polyimide precursor composition for extrusion molding of a polyimide which comprises the steps of placing a poor solvent naving a low solubility for a polyimide precursor in a mixer equipped with a stirrer having a stirring blade and a disc above the stirring blade, forming high-speed solvent layers of the poor solvent on the stirring blade and an inner wall of the mixer by rotating the stirring blade and the disc at a velocity of 100 rpm or more such that the upper surface of the disc, which is below the surface of the poor solvent when the disc is at rest, is above the level of the solvent when rotated at high speed, and then pouring in a thin flow state, onto the rotating disc, the polyimide precursor solution obtained by reacting (a) an aromatic tetracarboxylic dianhydride or its derivative with (b) an aromatic diamine or its derivative in a good solvent having a high solubility for the polyimide precursor, whereby the polyimide precursor solution is dispersed in the high speed solvent layers of the poor solvent by the centrifugal force of the disc to deposit (c) the polyimide precursor.

7. A process for preparing molded articles of a polyimide which comprises the steps of melting and extruding, at 50° to 100° C., a polyimide precursor composition for extrusion molding of polyimide comprising 30 to 45% by weight of (c) a polyimide precursor obtained by reacting (a) an aromatic tetracarboxylic dianhydride or its derivative with (b) an aromatic diamine or its derivative in a good solvent having a high solubility for the polyimide precursor and then depositing the resultant polyimide precursor (c) in a poor solvent having a low solubility for the polyimide precursor, 0.1 to 5% by weight of the poor solvent, and 35 to 69.9% by weight of the good solvent, and then heating the molded composition at 250° to 500° C. to imidate the same.

5,589,112
CONSTRUCTING A HIGH DENSITY CELL CULTURE SYSTEM

Glenn F. Spaulding, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 996,263, Dec. 23, 1992, Pat. No. 3,330,908. This application Apr. 13, 1994, Ser. No. 227,827
Int. Cl.[6] B29C *67/20;* **B23K** *26/10*
U.S. Cl. 264—413 **5 Claims**



1. A method for constructing a rotatable culture vessel for containing a liquid culture medium, and defining an annular culture chamber, for use with conventional laboratory roller devices, the method comprising:

subjecting a one piece, self-supporting and substantially rigid plastic molded annularly shaped housing having an inner cylindrically shaped wall and an outer cylindrically shaped wall forming therebetween an annular chamber disposed about a common longitudinal axis and an annular transverse end wall so as to have an open bore through said housing to bombardment means for producing microperforations through said inner and outer walls while rotating and moving the housing relative to the bombardment means to develop said microperforations along the length and about the periphery of said walls where such microperforations are sized for admitting oxygen in the atmosphere to the annular chamber while retaining the liquid culture media in the annular chamber.

5,589,113
PROCESS OF INVERTING AN ARTICLE OR AIR BAG

Ricky J. Frye, Miamisburg; Jon T. Mitts, and Ron Rufener, both of Milford, all of Ohio, assignors to MIM Industries, Inc., Miamisburg, Ohio

Filed May 6, 1994, Ser. No. 239,327
Int. Cl.[6] B29C *69/00*
U.S. Cl. 264—40.5 **16 Claims**

1. A method of operating on an article defining a cavity comprising the steps of:

(a) inverting the article; and

(b) moving the entire article to cause the article to flatten.

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5,589,114

TEMPERATURE REGULATING SYSTEM, METHOD AND APPARATUS

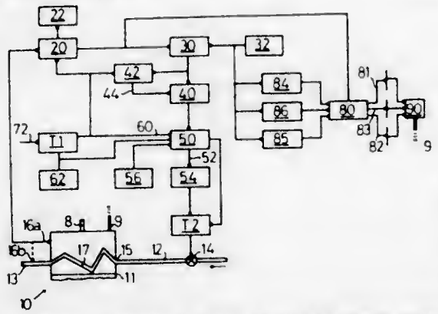
Rowland F. Evans, 25 Dunlin Drive, Featherstone WV10 7TC Staffordshire, United Kingdom

Division of Ser. No. 50,409, May 17, 1993, Pat. No. 5,452,999. This application Jun. 2, 1995, Ser. No. 460,659

Claims priority, application United Kingdom, Nov. 16, 1990, 9025015

Int. Cl.[6] B29C *33/02*

U.S. Cl. 264—40.6 **13 Claims**



1. A method to maintain the temperature of a mould of a plastic injection moulding machine within a predetermined temperature range, the machine having cooperating closable moulds heated by plastic injection material supplied to the mould during successive machine cycles, a mould having a conduction circuit for circulation of coolant to remove excess heat introduced by said material, a coolant inflow duct and a coolant discharge duct connected to the conduction circuit, one of the inflow and discharge ducts including at least one valve having an open state allowing a maximum volumetric rate of flow of coolant and a closed state allowing a minimum volumetric rate of flow of coolant, the method comprising the steps of: continuously performing working cycles including closing together the moulds, and initiating during a cycle a first term in which the valve is in the closed state and a second term in which the valve is in the open state, characterized by cycle stage response means, by terminating said first term in dependence upon said response means so that the first term is the same for each cycle, and by terminating the said second term in accordance with a mould temperature measurement taken before the end of said first term.

5,589,115

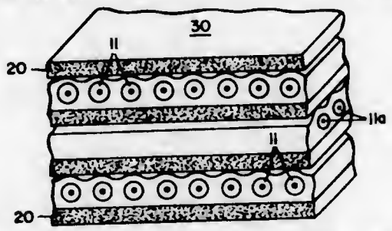
METHOD FOR MAKING FIBER-REINFORCED CERAMIC MATRIX COMPOSITE

Diana L. Sherwood, Wellsville, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 121,413, Nov. 16, 1987, abandoned. This application Jan. 23, 1990, Ser. No. 468,687

Int. Cl.[6] C04B *33/36;* **B05D** *3/06*

U.S. Cl. 264—60 **19 Claims**



1. A method for the manufacture of a fiber-reinforced ceramic matrix composite article comprising the steps of:

(a) combining a particulate ceramic material and a binder material into a mixture and forming the mixture into a ceramic sheet;

(b) providing a fiber reinforcement material consisting essentially of a sheet of refractory inorganic fibers wherein the fibers are disposed in open array;

(c) combining the ceramic sheet and the fiber sheet to provide a multilayer preform comprising at least one layer consisting of the fiber sheet and at least one layer consisting of ceramic sheet; and

(d) applying heat and pressure to the preform to consolidate it into a unitary, substantially void-free, fiber-reinforced ceramic matrix composite article.

5,589,116

PROCESS FOR PREPARING A SILICON CARBIDE SINTERED BODY FOR USE IN SEMICONDUCTOR EQUIPMENT

Shoichi Kojima, Tokyo; Kazuhiro Minagawa, Amagasaki; Haruyuki Kano, Ibaraki-ken; Tadaaki Miyazaki, Higashi-Yamato, and Hiroaki Wada, Kawasaki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 913,951, Jul. 17, 1992, Pat. No. 5,318,761. This application Jan. 18, 1994, Ser. No. 181,945

Claims priority, application Japan, Jul. 18, 1991, 3-178389; Jan. 18, 1993, 5-006264

Int. Cl.[6] C04B *35/54;35/56*

U.S. Cl. 264—65 **24 Claims**

1. A process for preparing a silicon carbide sintered body suitable for use in manufacture of semiconductor equipment comprising steps of shaping a silicon carbide powder to form a shaped body, calcining the shaped body in a non-oxidizing atmosphere to form a porous body, and subjecting the porous body to reaction sintering while being impregnated with molten silicon,

wherein the silicon carbide powder consists essentially of β-SiC and has an average particle diameter of about 0.5–20 μm, a free carbon content of not greater than about 20% by weight, and a content of 1 ppm or less of each of alkali metal, alkaline earth metal, B, Al, Ga and heavy metal atoms, and

wherein the silicon carbide powder is prepared by a method which comprises preparing a carbon- and silicon- containing starting mixture comprising (a) at least one siliceous material selected from liquid hydrolyzable silicon compounds and solid siliceous substances derived from a hydrolyzable silicon compound, and (b) at least one carbonaceous material selected from polymerizable or cross-linkable organic compounds prepared in the presence of a catalyst which is substantially free of each of alkali metal, alkaline earth metal, B, Al, Ga and heavy metal atoms, at least one material used as component (a) or (b) being a liquid substance, solidifying the starting mixture by heating, by use of a catalyst or a curing agent, or by a combination thereof to form a solid body, and forming the silicon carbide powder by heating the solid body at a temperature of from about 1600° C. to about 2000° C. in a non-oxidizing atmosphere.

5,589,117

INTEGRATED ABSORBENT STRUCTURES WITH DENSITY AND LIQUID AFFINITY GRADIENTS AND METHODS FOR MAKING THE SAME

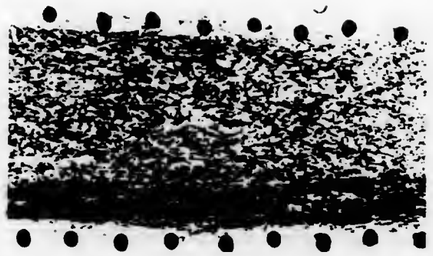
Ching-Yun M. Yang, Princeton Junction, N.J., assignor to McNeil-PPC, Inc., Skillman, N.J.

Division of Ser. No. 176,747, Jan. 3, 1994, Pat. No. 5,525,407. This application Jun. 8, 1995, Ser. No. 495,740

Int. Cl.[6] B27N *3/04*

U.S. Cl. 264—113 **6 Claims**

1. Utilizing a web-forming apparatus, a process for forming an absorbent composite having contiguous density and fluid affinity gradients wherein said process includes the step of increasing the amount of pulp fed into said web-forming apparatus relative to the



amount of fiber fed into said web-forming apparatus, such that the composite produced has at least three integrated layers wherein the amount of pulp relative to the amount of fiber is different in each layer and the amount of pulp relative to the amount of fiber continuously increases from top to bottom of said absorbent composite.

5,589,118

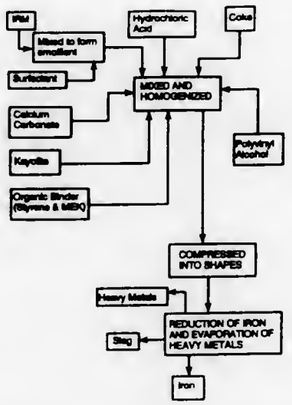
PROCESS FOR RECOVERING IRON FROM IRON-CONTAINING MATERIAL

George W. Ford, Jr., Salt Lake City; Richard C. Lambert, Lehi, and Russell G. Madsen, Price, all of Utah, assignors to Covol Technologies, Inc., Lehi, Utah

Continuation-in-part of Ser. No. 184,099, Jan. 21, 1994, Pat. No. 5,453,103. This application Jun. 6, 1995, Ser. No. 468,104

Int. Cl.[6] C22B *1/245;* **B29C** *47/00*

U.S. Cl. 264—122 **13 Claims**



1. A process for manufacturing articles from fine iron-containing material, the process comprising;

(a) mixing the iron-containing material, and carbon, to form an iron-containing/carbon mixture, the mixture being essentially free of oils and moisture;

(b) dissolving styrene or acrylonitrile polymer in a hygroscopic solvent;

(c) combining the dissolved styrene or acrylonitrile polymer, the iron-containing/carbon mixture, calcium carbonate, and an alumino-silicate binder;

(d) emulsifying polyvinyl polymer in water, adding the emulsion to the combination of step (c) and substantially homogenizing the resultant; and

(e) compressing the resultant from (d) into articles.

5,589,119

SILICONE ELASTOMER SEALS FOR MOLDED PLASTIC PARTS

Ray C. Hetherington, Virginia Beach, Va., assignor to New Southland, Inc., Virginia Beach, Va.

Filed Dec. 22, 1994, Ser. No. 362,276

Int. Cl.[6] B29C *59/00*

U.S. Cl. 264—129 **23 Claims**

1. A process comprising:

admixing an aromatic polyamide polymer and 0.01–1 wt. %, based on the total weight of said aromatic polyamide polymer, of an aminofunctional silicone fluid;

molding the resultant pretreated aromatic polyamide polymer, in the presence of moisture into a plastic part at a temperature sufficient to chemically graft the amino function of the silicone fluid to the aromatic carbonyl function of the aromatic polyamide polymer and to form silanol groups in the aminofunctional silicone fluid;

coating the molded plastic part with an organofunctional alkoxysilane having at least one vinyl group and heating the coated molded plastic part to convert the alkoxysilane into a siloxane polymer with vinyl and silanol groups and react the silanol groups thereof with silanol groups of the aminofunctional silicone fluid; and

applying a liquid silicone elastomer composition containing at least one Si—H group to the coated molded plastic part and heating same to form a covalent bond between vinyl groups of the siloxane polymer and Si—H groups of the elastomer, the liquid silicone elastomer forming a seal bonded to the molded plastic part.

5,589,120

PROCESS OF MAKING A SHAPED TIP ON A CATHETER

Azhar J. Khan, West Valley City; David P. Hopkins, Salt Lake City, and Mohammad A. Khan, Sandy, all of Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 294,275, Aug. 22, 1994. This application May 18, 1995, Ser. No. 443,649

Int. Cl.[6] B29C *43/02;43/52;57/00*

U.S. Cl. 264—130 **16 Claims**

1. A method for forming a shaped tip on a catheter comprising:

applying a tipping lubricant solution containing a silicone surfactant and water to a tip of an untipped catheter tubing:

placing the untipped catheter tubing on a mandrel;

heating the untipped catheter tubing;

engaging the mandrel with a die to form the catheter tip; and

removing the shaped catheter tubing from the die and mandrel.

5,589,121

METHOD OF ENLARGING DESIGN PROVIDED ON A SYNTHETIC RESIN FILM

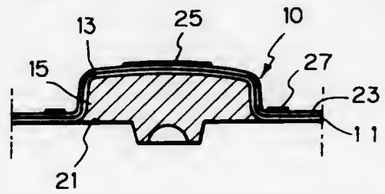
Jiro Inagaki; Takashi Shinoki, and Atsushi Hari, all of Kanagawa-ken, Japan, assignors to Teikoku Tsushin Kogyo Co., Ltd., Kanagawa-ken, Japan

Filed Dec. 14, 1994, Ser. No. 355,540

Claims priority, application Japan, Jul. 12, 1994, 6-183841

Int. Cl.[6] B29C *45/16*

U.S. Cl. 264—132 **5 Claims**



1. A method of enlarging a design possessed by a synthetic resin film, comprising:

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a printing step of printing a desired design on a top side or bottom side of a synthetic resin film exhibiting flexibility; and

an enlarging deformation step of enlarging the design by stretching a prescribed surface of the synthetic resin film which includes a portion on which the design has been printed and curvingly deforming the prescribed surface in such a manner that the surface will protrude above a plane defined by the synthetic resin film;

the design printed on the synthetic resin film at said printing step being printed in dependence upon rate of enlargement of each portion of the synthetic resin film stretched at said enlarging deformation step, with a portion of the design having a small rate of enlargement being printed at relatively large dimensions in comparison with other portions thereof and a portion of the design having a high rate of enlargement being printed at relatively small dimensions in comparison with other portions thereof, whereby the overall enlarged design after enlarging deformation takes on a desired shape;

in said printing step, a print layer for being clamped by upper and lower molds being printed on a surface or underside of the synthetic resin film on at least a portion thereof surrounding the portion deformed by enlargement;

said enlarging deformation step being performed by urging the synthetic resin film upward into intimate adhering contact with an inner surface of a cavity in the upper mold in a state in which the synthetic resin film is clamped between the upper mold and lower mold each of which has a cavity; and

separating the upper and lower molds.

5,589,122

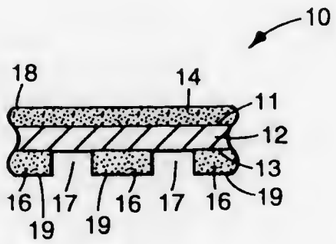
METHOD OF MAKING DOUBLE-SIDED PRESSURE-SENSITIVE ADHESIVE TAPE

William K. Leonard, Troy Township, Wis.; Kirit C. Mody, Shoreview, and Richard J. Rolando, Oakdale, both of Minn., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 166,549, Dec. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 769,548, Oct. 1, 1991, abandoned. This application Mar. 29, 1995, Ser. No. 412,758

Int. Cl.[6] B29C *47/06*

U.S. Cl. 264—146 **20 Claims**



1. A solvent-free method for the manufacture of pressure-sensitive adhesive tape comprising the steps of:

(a) providing first and second solvent-free pressure-sensitive adhesive compositions and forming molten streams thereof;

(b) providing a solvent-free backing-forming material and forming a molten stream thereof;

(c) combining said streams into a single unified molten structure having a first layer of pressure-sensitive adhesive composition formed from said first molten stream of pressure-sensitive adhesive composition, a second layer of pressure-sensitive adhesive composition formed from said second molten stream of pressure-sensitive adhesive composition, and a layer of backing-forming material disposed between said pressure-sensitive adhesive layers, wherein at least one of said layers of adhesive is not coextensive; and

(d) cooling said molten structure to yield a composite pressure-sensitive adhesive tape comprising a backing with first and second major surfaces formed from said backing-forming material, a first layer of normally tacky pressure-sensitive adhesive formed from said first layer of pressure-sensitive adhesive composition on said first major surface, and a second layer of normally tacky pressure-sensitive adhesive formed from said second layer of pressure-sensitive adhesive composition on said second major surface, wherein at least one of said layers of adhesive is non-coextensive.

5,589,123

PROCESS OF MAKING A TUBULAR SUPPORTING ELEMENT

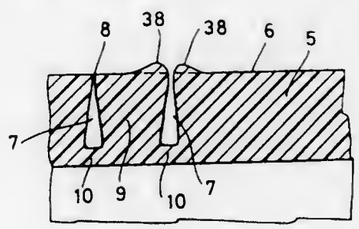
Francesco Portas, Quattordio, Italy, assignor to Pirelli Cavi S.p.A., Milan, Italy

Division of Ser. No. 351,878, Dec. 8, 1994, which is a continuation of Ser. No. 985,182, Dec. 2, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 411,421

Claims priority, application Italy, Dec. 16, 1991, MI91A3362

Int. Cl.[6] B29C *67/00*

U.S. Cl. 264—154 **6 Claims**



1. Process for making a tubular supporting element for a sleeve for covering junctions of cables, the supporting element comprising a tubular body with a wall of a predetermined radial thickness having at least one reverse V-shaped helical incision therein with a radial dimension less than said predetermined thickness and with an outer surface and an inner surface coaxial with the axis of said body, said outer surface being engageable with an inner surface of said sleeve, comprising the steps of:

constraining the supporting element to a supporting means under conditions of substantial axial containment and

helically making at least one reverse V-shaped incision in said wall, which is continuous circumferentially of said axis, by means of a cutting blade in condition of axial containment of said supporting element,

wherein said incision separates portions of said wall from each other so as to define a strip between one turn of the incision and the next turn of the incision which strip thereby extends helically around said axis, said incision extends radially of said axis either from said outer surface of said tubular body toward said inner surface of said tubular body or from said inner surface of said tubular body toward said outer surface of said tubular body, and said incision has a reverse V-shaped cross-section having a mouth at said outer or inner surface and a width at said radial portion, said mouth having a width transverse to the helical length of said incision which is not greater than the said width at said radial portion.

5,589,124

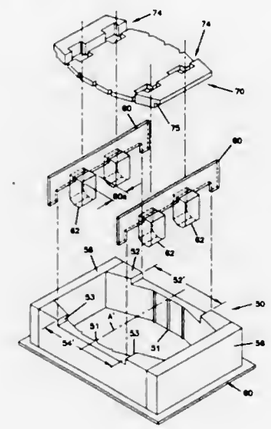
METHOD OF FORMING COMPOSITE MASONRY BLOCKS

Michael E. Woolford, Lake Elmo, Minn., and Dick J. Sievert, New Richmond, Wis., assignors to Block Systems, Inc., North St. Paul, Minn.

Continuation of Ser. No. 157,830, Nov. 24, 1993, abandoned, which is a division of Ser. No. 651,322, Feb. 6, 1991, Pat. No. 5,294,216, which is a division of Ser. No. 534,831, Jun. 7, 1990, Pat. No. 5,062,610, which is a continuation-in-part of Ser. No. 413,400, Sep. 28, 1989, abandoned, and Ser. No. 413,050, Sep. 28, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,795

Int. Cl.[6] B28B *3/00;11/14*

U.S. Cl. 264—157 **25 Claims**



1. A method of using a masonry block mold to form masonry block having at least one flange extending therefrom, said mold having a fill-receiving cavity defined therein having an open top and bottom, said mold comprising a pair of opposed side walls connected by end walls, each of said side walls comprising a flange projecting into said fill-receiving cavity, each side wall comprising a top edge and a bottom edge, said bottom edges adapted to seat on a generally horizontal pallet, and said top edges each comprising at least one step so as to form first portions thereof which are higher than adjacent portions thereof, said method comprising the steps of:

(a) loading said mold with block fill through said top of said cavity;

(b) drawing excess block fill from said top of said cavity;

(c) holding block fill proximate said first portions at a level above that proximate said adjacent portions of said top edges to form at least one flange on said block fill;

(d) compressing said block fill within said mold with a compression head moving into said cavity from top to bottom wherein grooves are formed in said block fill by said mold side wall flanges;

(e) stripping a formed masonry block having at least one flange extending therefrom from said mold; and

(f) splitting said formed masonry block adjacent said grooves in said formed masonry block.

5,589,125

PROCESS OF AND APPARATUS FOR MAKING CELLULOSE MOULDINGS

Stefan Zikeli, Regau; Ernst Rauch, Schörfling; Hermann Koberger, Zipf; Friedrich Ecker, Timelkam; Hartmut Rüf, Vöcklabruck; Raimund Jurkovic, and Franz Schwenninger, Both of Lenzing, all of Austria, assignors to Lenzing Aktiengesellschaft, Austria

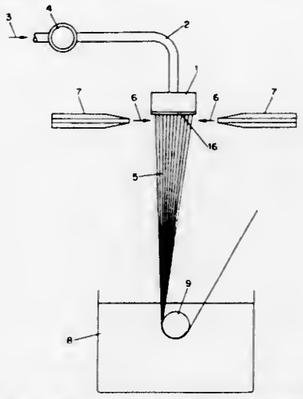
PCT No. PCT/AT93/00053, § 371 Date Nov. 16, 1993, § 102(e) Date Nov. 16, 1993, PCT Pub. No. WO93/19230, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 17, 1993, Ser. No. 142,313

Claims priority, application Austria, Mar. 17, 1992, 537/92

Int. Cl.[6] D01F *2/24*

U.S. Cl. 264—187 **11 Claims**



1. A process for the preparation of cellulose mouldings comprising the steps of:

moulding a hot solution of cellulose in a tertiary amine-oxide by passing the cellulose solution through a spinneret,

cooling the hot moulded solution by exposing it to a gas stream, wherein the direction of spinning is essentially at right angles to the gas stream, and

introducing the cooled moulded solution into a precipitation bath thereby forming a cellulose moulding, whereby cooling of the hot moulded solution takes place immediately after the moulding process and before introduction into the bath.

5,589,126

PLASTICIZED POLYESTER FOR SHRINK FILM APPLICATIONS

Wayne K. Shih, and Ronald R. Light, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 410,594, Mar. 24, 1995, Pat. No. 5,534,570, which is a continuation of Ser. No. 157,546, Nov. 26, 1993, abandoned. This application Mar. 4, 1996, Ser. No. 608,021

Int. Cl.[6] D01F *1/02*

U.S. Cl. 264—211 **2 Claims**

1. A process for preparing a heat-shrinkable film comprising:

(I) mixing at a temperature of 200° C. to 315° C.

(A) 90 to 99 weight percent of a polyester having a glass transition temperature of 40° C. to 150° C. and an inherent viscosity of 0.5 to 1.2 dL/g, comprising

(1) a dicarboxylic acid component comprising repeat units from at least 80 mole percent of an aromatic dicarboxylic acid having 8 to 14 carbon atoms, and

(2) a diol component-comprising repeat units from at least 10 mole percent of 1,4-cyclohexanedimethanol, based on 100 mole percent dicarboxylic acid and 100 mole percent diol; and

(B) 1 to 10 weight percent of a plasticizer selected from a C_4 to C20 alkyl ester of an epoxidized fatty acid having 12 to 20

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carbon atoms provided the plasticizer has sufficient stability to permit its incorporation into the polyester at a temperature of 200° C. to 300° C., wherein the combined weights of (A) and (B) total 100 percent; and

(II) forming the blend into a film.

5,589,127

METHOD AND APPARATUS FOR FORMING RIBS WITH SIDEWARD PROJECTIONS IN A PLASTIC PIPE, AND A PLASTIC PIPE

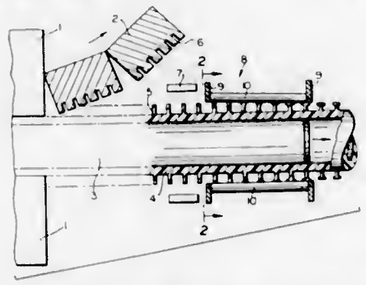
Jyri Järvenkylä, Hollola, Finland; Dieter Scharwächter, Ostrup, Germany; Åke Johansson, and Ronny Kristensson, both of Fristad, Sweden, assignors to Uponor Innovation AB, Fristad, Sweden

Filed Feb. 15, 1994, Ser. No. 196,406

Claims priority, application Finland, Feb. 24, 1993, 930826

Int. Cl.[6] B29D *16/00*

U.S. Cl. 264—280 **14 Claims**



14. A method for providing annular ribs of a plastic pipe with oppositely sideward projections, comprising:

surrounding the plastic pipe having the annular ribs with rib rolling means and relatively moving the rib rolling means longitudinally to the pipe and rotatingly around a longitudinal axis of the pipe, the rib rolling means defining a conical rib-engaging rotation surface decreasing in diameter in the direction of the relative movement of the pipe for gradually compressing the ribs annularly and forming the oppositely sideward projections on each of the ribs and the rib rolling means comprising elongated rolls rotatable about and rotating about respective axes disposed circumferentially around the pipe.

5,589,128

PERFORMANCE SUPER HIGH FLOW ETHYLENE POLYMER COMPOSITIONS

Shih-Yaw Lai, Sugar Land; Lonnie G. Hazlitt, and Pak-Wing S. Chum, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 924,775, Aug. 4, 1992, Pat. No. 5,346,732. This application Aug. 12, 1994, Ser. No. 289,978

Int. Cl.[6] B29B *7/00*

U.S. Cl. 264—328.1 **15 Claims**

1. A method of forming a thermally formed article, comprising the steps of:

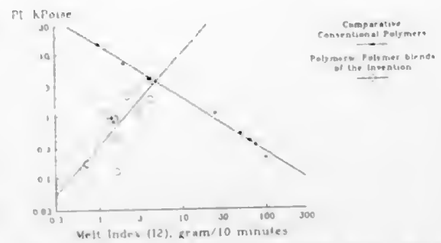
(A) melt extruding an ethylene polymer composition comprising at least one linear ethylene polymer having

(a) a density from about 0.87 g/cm^3 to about 0.965 g/cm^3,

(b) a melt index, I_2, as measured by ASTM D-1238(190° C./2.16 kg), from about 0.1 grams/10 minutes to about 2 grams /10 minutes,

(c) a melt index, I_{10}, as measured by ASTM D-1238(190° C./10 kg), from about 28 grams/10 minutes to about 55 grams/10 minutes,

(d) a melt flow ratio, I_{10}/I_2, from about 14 to about 550,



(e) a processing index from about 0.005 Kpoise to about 1 Kpoise, and

(B) molding the thermally formed article from the composition.

5,589,129

METHOD OF MANUFACTURING A MOLDING USING A FILLER OR AN ADDITIVE CONCENTRATED ON AN ARBITRARY PORTION OR DISTRIBUTED AT A GRADIENT CONCENTRATION

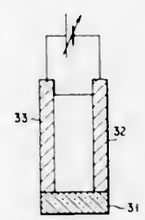
Tsuguo Kato, Fujisawa, and Cao M. Thai, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 198,262, Feb. 18, 1994, abandoned. This application Jun. 19, 1995, Ser. No. 491,687

Claims priority, application Japan, Feb. 19, 1993, 5-030161

Int. Cl.[6] B29C *35/08*

U.S. Cl. 264—437 **18 Claims**



1. A method of manufacturing a molding, which comprises the steps of:

injecting a liquid resin composition containing at least one of an ionic material and a chargeable material into a mold;

applying a DC voltage to the liquid resin composition to make said at least one of the ionic material and the chargeable material migrate, thereby forming a concentration gradation of said at least one of the ionic material and chargeable material in the liquid resin composition, the liquid resin composition being in a liquid state while the DC voltage is being applied; and

solidifying the liquid resin composition.

5,589,130

METHOD OF INJECTION MOLDING A PREFORM AND APPARATUS FOR THE SAME

Minoru Takada; Koichi Sato, and Kazuyuki Yokobayashi, all of Ueda, Japan, assignors to Nissei ASB Machine Co., Ltd., Komori, Japan

PCT No. PCT/JP94/01247, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO95/03930, PCT Pub. Date Feb. 9, 1995

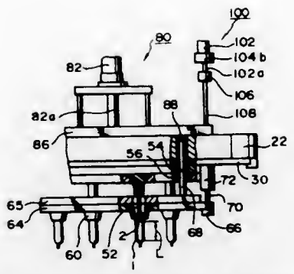
PCT Filed Jul. 29, 1994, Ser. No. 403,742

Claims priority, application Japan, Jul. 30, 1993, 5-208547

Int. Cl.[6] B29C *49/06;49/64*

U.S. Cl. 264—537 **22 Claims**

1. A method of injection molding a preform, comprising:



a step in an injection molding station of injection molding a preform in clamped molds including an injection cavity mold and injection core mold each of which has a cooling portion;

a step in said injection molding station of releasing said preform from said injection cavity mold;

a step of transferring said preform while being cooled by said injection core mold to a cooling and ejection station; and

a step in said cooling and ejection station of cooling said preform by said injection core mold and thereafter ejecting said preform from said injection core mold during an injection molding cycle for a next preform in said injection molding station, wherein

in said injection molding step, said preform, which has a neck portion having an undercut with respect to a direction of mold-opening, is injection molded using a neck cavity mold defining the outer surface of said neck portion, and said neck cavity mold comprises a split pair of molds having cooling portions;

in said transfer step and said cooling step in said cooling and ejection station, said preform is cooled with said injection core mold and said neck cavity mold maintained in the clamped state; and

in said ejection step in said cooling and ejection station, said injection core mold is separated from said neck cavity mold by relative mold-opening driving through only a stroke sufficient to allow a space to open between said injection core mold and the inner surface of said preform held by said neck cavity mold, and thereafter said split pair of molds of said neck cavity mold is driven to be separated, and said preform is ejected.

5,589,131

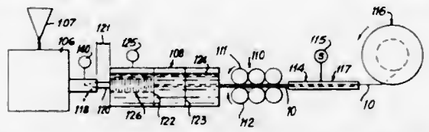
METHOD FOR MANUFACTURING A REPLACEMENT PIPE FOR INSTALLATION IN AN EXISTING CONDUIT

Campbell H. Steketee, Jr., Salem, Oreg., assignor to NuPipe, Inc., Memphis, Tenn.

Continuation of Ser. No. 612,163, Nov. 9, 1990, abandoned, which is a division of Ser. No. 180,904, Apr. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 76,973, Jul. 28, 1987, Pat. No. 4,867,921, which is a continuation-in-part of Ser. No. 846,322, Mar. 31, 1986, abandoned. This application Mar. 19, 1993, Ser. No. 34,918

Int. Cl.[6] B29C *47/90;63/34*

U.S. Cl. 264—568 **19 Claims**



1. A method of manufacturing a thermoplastic pipe in collapsed and folded form suitable for installation in an existing conduit by:

extruding a thermoplastic pipe material while in a hot plastic state through a die to form it into a tubular shape of desired size and having a circumferential dimension;

feeding the resulting hot tubular thermoplastic pipe material while still in a plastic state through non-circular calibrator means having an opening for shaping the thermoplastic material fed therethrough, the openings sized and shaped to collapse, fold and hold the tubular thermoplastic material to the desired collapsed and folded form while subjecting the material to a partial vacuum, the pipe material having the desired collapsed and folded form;

cooling the collapsed and folded material while pulling it through and from the calibrator means, the material having a memory for the collapsed and folded form such that when reheated to render it pliable, it retains the collapsed and folded form;

hardening the thermoplastic material in collapsed and folded form,

reheating the collapsed and folded thermoplastic material to render it pliable, and

winding the pliable material in its collapsed and folded form onto a storage spool.

5,589,132

METHOD AND DEVICE FOR PURIFYING AND MOISTENING AIR

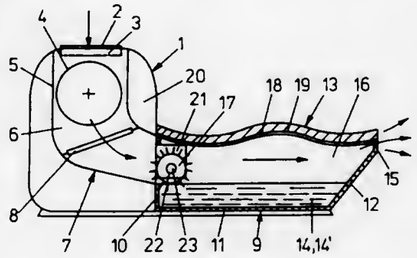
Gunther Zippel, Pommernstrasse 29, 93073 Neutraubling, Germany

Filed Feb. 1, 1995, Ser. No. 382,193

Claims priority, application Germany, Feb. 3, 1994, 44 03 358.3; Aug. 19, 1994, 44 29 502.2

Int. Cl.[6] A61L *9/20;* **F24F** *6/14*

U.S. Cl. 422—24 **14 Claims**



1. A method for purifying and moistening air within restricted areas, especially living and working rooms, according to which a fan-driven air stream is drawn into a casing of an air treating device, is filtered at an entrance of said device, is sterilized by ultraviolet radiation, is brought into contact with a water supply, and is discharged into a room as a purified and moistened air stream, the method comprising the steps of:

passing an air stream through a channel-type passageway provided within a casing of an air treating device, sterilizing said air stream by ultraviolet radiation within said passageway, passing said air stream through an extension of said passageway over a substantially stagnant relatively large surface-area of a water supply provided within a tray and through an air channel formed by said water surface, a corrugated cover plate and side walls of said tray, and introducing discontinuities into said water surface of said tray and said air stream between said water supply and said cover plate above said water surface.

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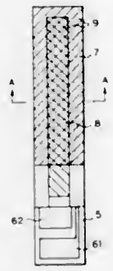
5,589,133

OXYGEN ELECTRODE, BIOSENSOR AND PROCESSES FOR MANUFACTURING SAME

Hiroaki Suzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 41,054, Mar. 31, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,209
Claims priority, application Japan, Jul. 20, 1992, 4-191768
Int. Cl.[6] G01N *27/404*
U.S. Cl. 422—79 **17 Claims**



1. An oxygen electrode comprising:
a plastic sheet having a planar surface;
an Ag/AgCl anode pattern on said surface of the plastic sheet;
a first electrode lead and pad pattern formed on the surface of the plastic sheet and electrically connected to said anode pattern;
a cathode pattern formed on said surface of the plastic sheet;
a second electrode lead and pad pattern formed on the surface of the plastic sheet and electrically connected to said cathode pattern;
a paraffin layer located on said surface of the plastic sheet over said patterns, said paraffin layer comprising a paraffin having a softening point of about 100° to 150° C. and being configured so as to delineate a sensitive area of the plastic sheet where portions of said anode and cathode patterns are exposed;
a carrier sheet formed of a natural or synthetic paper or a woven or non-woven cloth overlying said sensitive area and contacting said portions of the anode and cathode patterns; and
a gas permeable membrane overlying a first portion of the carrier sheet and the paraffin layer, said membrane being positioned and configured so that there is a second portion of the carrier sheet which is not covered by the membrane, whereby an electrolyte solution may be impregnated through said second portion of the carrier sheet.

5,589,134

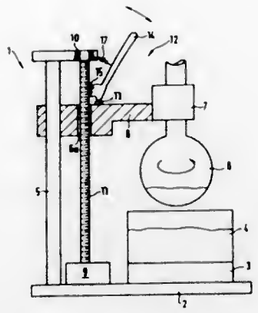
Patent Not Issued For This Number

5,589,135

HEIGHT ADJUSTABLE STAND FOR LABORATORY EQUIPMENT

Erwin Bossart, Flawil, Switzerland, assignor to Buchi Laboratoriums - Technik AG, Flawil, Switzerland

Filed Sep. 22, 1992, Ser. No. 948,439
Claims priority, application Switzerland, Oct. 18, 1991, 3063/91
Int. Cl.[6] B01L *9/06*
U.S. Cl. 422—99 **6 Claims**



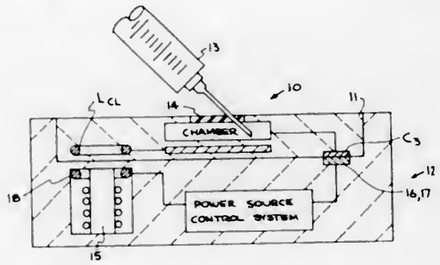
1. A height adjustable stand for a laboratory flask, comprising:
a vertical stand post;
a flask holder supported on said post for movement therealong;
a motorized continuous elevator drive for moving the flask holder at a predetermined speed, said elevator drive comprising a helically threaded, vertical, rotary spindle;
a normally engaged clutch connecting the elevator drive to the flask holder, said clutch comprising toothed means for engaging said spindle thread; and
means for manually releasing said clutch so that the flask holder can be moved independent from said elevator drive, said releasing means comprising a manually operable release lever pivotally mounted on said flask holder and connected to said toothed means, for moving said clutch means between engaged and disengaged positions with respect to said spindle.

5,589,136

SILICON-BASED SLEEVE DEVICES FOR CHEMICAL REACTIONS

M. Allen Northrup, Berkeley; Raymond P. Mariella, Jr., Danville; Anthony V. Carrano, and Joseph W. Balch, both of Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Jun. 20, 1995, Ser. No. 492,678
Int. Cl.[6] B01L *3/00*
U.S. Cl. 422—102 **22 Claims**



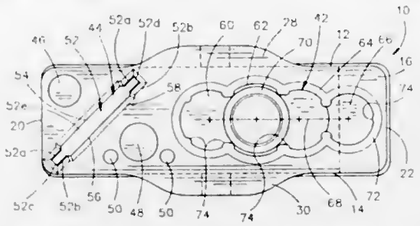
1. In a microfabricated chemical reactor having a reaction chamber, the improvement comprising:
a sleeve reaction chamber,
said sleeve reaction chamber having a slot therein,
said slot being constructed to enable insertion of an insert or liner therein, and
heating means for said sleeve reaction chamber.

5,589,137

SPECIMEN CARRIER

Rodney S. Markin, Omaha, and Michael R. Newcomb, Papillion, both of Nebr., assignors to Lab-Interlink, Inc., Omaha, Nebr.

Filed Apr. 7, 1995, Ser. No. 418,958
Int. Cl.[6] B01L *9/06*
U.S. Cl. 422—104 **31 Claims**



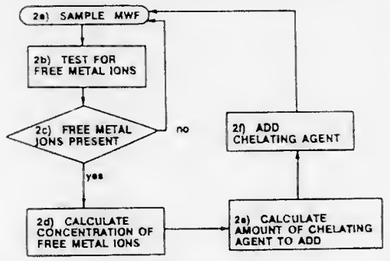
1. A specimen carrier for transporting a laboratory specimen carried within a specimen tube or on a specimen slide, comprising:
a carrier body having a forward face and opposing rearward face, a top surface and opposing bottom surface, a right end wall and opposing left end wall an aperture having alternating curved portions forming a plurality of vertical cylindrical holes for receiving specimen tubes of varying diameter and depth dimensions, said aperture comprising;
a first vertical cylindrical hole formed in the top surface of the carrier body, said hole having a first diameter and depth dimensions so as to receive a first specimen tube partially therein; and
a second vertical cylindrical hole formed in the top surface of the carrier body said second hole having a second diameter and depth dimensions different from said first hole so as to receive a second specimen tube having diameter and depth dimensions different from said first tube; said second hole, overlapping the first hole to form a single cavity, wherein said cavity extends vertically from the lower end to an open upper end at the top surface of the carrier body and extends horizontally to include the diameter of each of said first and second holes, to retain fluid therein.

5,589,138

APPARATUS FOR AND METHODS OF STABILIZING AND REGENERATING METALWORKING FLUIDS

Peter H. Drechsler, New Britain, Conn., assignor to The Torrington Company, Torrington, Conn.

Division of Ser. No. 203,154, Feb. 28, 1994, Pat. No. 5,445,945. This application Mar. 31, 1995, Ser. No. 414,846
Int. Cl.[6] G05B *13/00;* **G01N** *30/96;* **B21B** *45/02*
U.S. Cl. 422—108 **11 Claims**



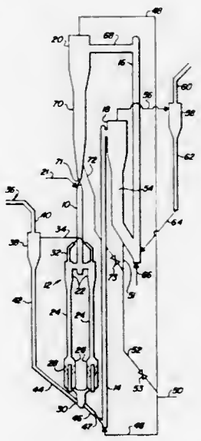
1. A system for controlling the state of a recirculating metalworking fluid (MWF), comprising:
a. monitoring means for testing said MWF for the presence of free metal ions in solution therein;
b. testing means for determining the concentration of free metal ions in said MWF; and
c. addition means, responsive to the testing means, for adding in a controlled manner an effective amount of at least one chelating agent effective to chelate said free metal ions in said MWF.

5,589,139

DOWNFLOW FCC REACTION ARRANGEMENT WITH UPFLOW REGENERATION

Randy J. Zinke, Carol Stream, and William J. Koves, Hoffman Estates, both of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 235,049, Apr. 29, 1994. This application Jun. 6, 1995, Ser. No. 479,098
Int. Cl.[6] F27B *15/02*
U.S. Cl. 422—144 **7 Claims**



1. An apparatus for the catalytic cracking of hydrocarbons, said apparatus comprising:
a) vertical reaction conduit defining an upper inlet for receiving catalyst particles and mean for introducing hydrocarbons into an upper portion of said conduit;
b) separator in communication a lower end of said conduit for separating gas from spent catalyst particles;
c) means for contacting catalyst particles from said reaction conduit with a stripping gas;
d) a catalyst collector communicating with a spent catalyst conduit to transfer spent catalyst from said collector to said spent catalyst conduit;
e) a first regenerator riser in communication at its lower end with a said spent catalyst conduit and a first regeneration gas conduit to transfer spent catalyst particles upwardly to the top of said riser;
f) a first regenerator cyclone communicating with an upper end of said first regenerator riser to separate said first regeneration gas from catalyst particles;
g) a second regenerator riser having a lower end in communication with said first regenerator cyclone for receiving catalyst particles therefrom and having means for contacting catalyst particles with a first regeneration gas to transport said catalyst particles upwardly therein;
h) a second regenerator cyclone located above said reaction conduit having an inlet in communication with an upper end

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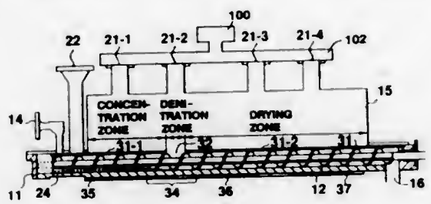
of said second regenerator riser, a gas outlet communicating with said first regeneration gas conduit, and a primary dip pipe conduit in direct communication with said reaction conduit for directly transferring regenerated catalyst particles to the inlet of said reaction conduit.

5,589,140

CONTINUOUS DENITRATION APPARATUS

Yoshiharu Takahashi, Katsuta, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Continuation of Ser. No. 121,422, Sep. 16, 1993, abandoned. This application Jan. 11, 1996, Ser. No. 583,934
Claims priority, application Japan, Sep. 16, 1992, 4-246708
Int. Cl.[6] G21G *5/00*
U.S. Cl. 422—159 **6 Claims**



1. A continuous denitration apparatus, operating on a nitrate solution, comprising:

a nitrate solution processing area which is divided into a concentration zone which uses heat to evaporate and concentrate nitrate solution, a denitration zone which denitrifies the nitrate solution concentrated in the concentration zone to prepare a denitrated product, and a drying zone for drying the denitrated product prepared in the denitration zone;

a screw element, extended along the nitrate solution processing area, and operating to convey the nitrate solution in a direction of its extended direction by rotating the screw element around a rotation axis thereof;

a microwave source; and

a critical shield plate formed of a microwave non-permeable material covering an entire length of the nitrate solution processing area, the critical shield plate including a microwave permeable portion provided in said denitration zone, over less than the entire length of the nitrate solution processing area, whereby microwaves from the microwave source are applied to the material for processing only at the microwave permeable part of the critical shield plate.

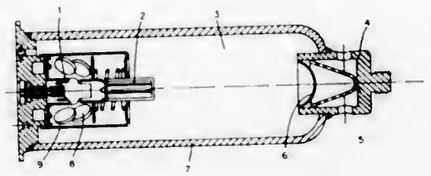
5,589,141

USE OF MIXED GASES IN HYBRID AIR BAG INFLATORS

James R. Sides; James D. Martin, and Robert S. Scheffee, all of Gainesville, Va., assignors to Atlantic Research Corporation, Vienna, Va.

Continuation-in-part of Ser. No. 414,565, Mar. 31, 1995, abandoned. This application Jul. 28, 1995, Ser. No. 492,955
Int. Cl.[6] B60R *21/26*
U.S. Cl. 422—164 **28 Claims**

1. A method of generating non-toxic gases without particulates comprising conducting an ignition of a propellant composition with an effective oxidizer, using a suitable propellant comprising aminoguanidine nitrate, in conjunction with a suitable binder, in the presence of argon and a molecular oxygen-containing gas, and selectively providing a ratio of said molecular oxygen-containing gas to argon prior to ignition to provide non-toxic reaction products in the exhaust gas.

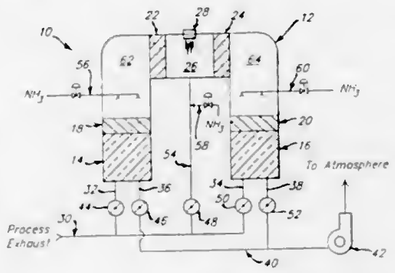


5,589,142

INTEGRATED REGENERATIVE CATALYTIC OXIDATION/SELECTIVE CATALYTIC REDUCTION ABATEMENT SYSTEM

Sean T. Gribbon, Farmington Hills, Mich., assignor to Salem Englehard, South Lyon, Mich.

Filed Jul. 27, 1994, Ser. No. 280,944
Int. Cl.[6] F23G *7/06;* **F23D** *14/00;* **B01D** *50/00*
U.S. Cl. 422—171 **1 Claim**



1. A system for removal of oxidizable contaminants and reducible gases from process emissions by an initial oxidation process and a subsequent reduction process, said system comprising:

a pair of regenerative units for receiving contaminated process emissions, selectively;

a source of contaminated process emissions;

a pair of contaminated process emission inlet conduits connected to said source and to one side of each of said regenerative units respectively;

a pair of cleansed emission outlet conduits communicating with the one side of said regenerative units, respectively and with the ambient atmosphere;

a contaminated process emission heating chamber connected to each of said regenerative units on the opposite side thereof, respectively, from said contaminated emission source;

a pair of catalytic oxidizers connected between said regenerative units, respectively, and said heating chamber for oxidizing contaminants in said process emissions;

a pair of reducing gas injectors between said catalytic oxidizers, respectively, and said heating chamber;

a pair of catalytic reduction units between said reducing gas injectors, respectively, and said heating chamber;

a pair of inlet valves in said inlet conduit between the source of contaminated process emissions and the one side of each of said regenerative units, respectively;

pair of outlet valves in said outlet conduits between the one side of said regenerative units, respectively and with the ambient atmospheres, said inlet and outlet valves being openable and closable for reversing the flow of contaminated process emissions and cleansed exhaust to and from said regenerative units, respectively;

a transition duct connected between the source of process emissions and said heating chamber for conducting contaminated process emissions directly to said heating chamber; and

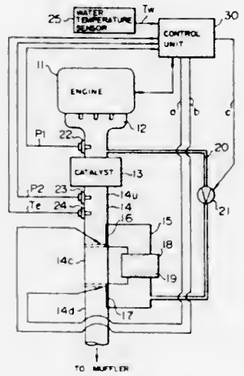
a reducing gas injector communicating directly with said heating chamber for injecting reducing gas into contaminated emissions introduced into said heating chamber by said transition duct.

5,589,143

EXHAUST GAS PURIFICATION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hiroshi Mori, Ichinomiya; Masakazu Tanaka, Okazaki; Mamoru Mabuchi, Kariya, and Makoto Saito, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 120,384, Sep. 14, 1993, abandoned. This application May 2, 1995, Ser. No. 434,320
Claims priority, application Japan, Sep. 16, 1992, 4-246903; Feb. 4, 1993, 5-040501; Feb. 25, 1993, 5-061036
Int. Cl.[6] B01D *50/00;* **F01N** *3/28*
U.S. Cl. 422—171 **5 Claims**



1. An apparatus for purifying an exhaust gas emitted from an internal combustion engine having an exhaust gas flow path, the apparatus comprising:

a catalyst unit provided in an exhaust gas flow path;

a bypass passage having first and second ends, each in communication with the exhaust gas flow path downstream of said catalyst unit;

an absorbent provided in said bypass passage for absorbing a hydrocarbon ("HC") gas contained in an exhaust gas emitted from an internal combustion engine:

a circulation passage having first and second ends, said first end being connected to a location in the exhaust gas flow path upstream of said catalyst unit, and said second end being connected to said bypass passage, downstream of said absorbent;

a circulation controlling means provided in said circulation passage for intermittently opening and closing said circulation passage in correspondence with an exhaust gas pulsation occurring at said location in the exhaust gas flow path upstream of said catalyst unit where said first end of said circulation passage is connected;

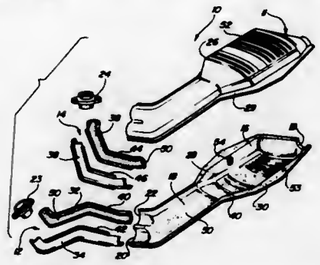
exhaust gas flow path change-over means for directing the exhaust gas to flow through said bypass passage when a temperature of said exhaust gas is lower than a threshold temperature, and for directing the exhaust gas to flow only in the exhaust gas flow path when a temperature of the exhaust gas is higher than the threshold temperature.

5,589,144

THERMAL BARRIER FOR AN EXHAUST SYSTEM

John E. Filippi, R. R. 1, Box 400, Negaunee, Mich. 49866, and John A. Golen, 5765 Berwyn, Dearborn Heights, Mich. 48127

Filed May 1, 1990, Ser. No. 517,305
Int. Cl.[6] B01D *50/00;* **B23K** *31/02*
U.S. Cl. 422—179 **11 Claims**



1. An exhaust system comprising:

a catalytic converter formed from a first half shell and a second half shell, said first and second half shells having an inside and an outside surface;

at least one intake pipe formed from a first half shell and a second half shell, said first and second half shells of said intake pipe having an inside and an outside surface; and

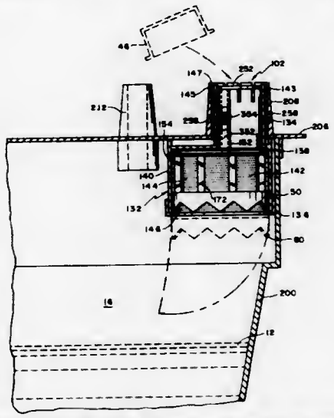
wherein the inside surface of the first and second half shells of the catalytic converter is coated with a thermal barrier coating by means of an arc plasma spray.

5,589,145

WASTE TREATMENT MATERIAL DISPENSING CANISTER

Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Division of Ser. No. 306,363, Sep. 15, 1994, Pat. No. 5,543,118, which is a continuation-in-part of Ser. No. 507,966, Apr. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 215,370, Jul. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 105,875, Oct. 7, 1987, abandoned. This application Aug. 24, 1995, Ser. No. 519,134
Int. Cl.[6] A61L *2/22;* **B65D** *53/02;* **B67D** *5/00;* **A61M** *1/00*
U.S. Cl. 422—292 **28 Claims**



1. A waste treatment material dispensing device for use with a closed waste fluid disposal vessel wherein said device is of a size and shape to be secured in a port disposed on said waste fluid disposal vessel, comprising:

(a) waste treatment material;

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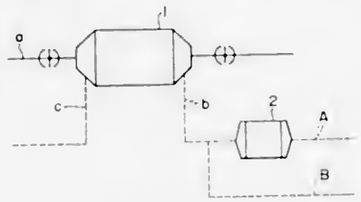
(b) a container, said container defining a storage volume for holding said waste treatment material, said container capable of being lockably disposed in a port, and said container having an exit port open to said fluid disposal vessel;
(c) a wall covering said exit port, said wall retaining said waste treatment material; and,
(d) an actuator provided on said container for releasing said waste treatment material into said vessel, said actuator opening said wall upon actuation.

5,589,146
METHOD FOR TREATING AMMONIA
Atsushi Morii; Osamu Naito; Toshiyuki Onishi; Hitoshi Nakamura, all of Nagasaki, and Kouzo Iida, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kaisha, Japan
Continuation of Ser. No. 169,606, Dec. 17, 1993, abandoned. This application Apr. 2, 1996, Ser. No. 626,577
Claims priority, application Japan, Dec. 21, 1992, 4-339940
Int. Cl.[6] C01C *3/00*
U.S. Cl. 423—237 **4 Claims**



1. A method of treating ammonia in an exhaust gas downstream of a dry denitration device using ammonia as a reducing agent, comprising the steps of adsorbing ammonia in an ammonia adsorbent-filled tower at a point where said exhaust gas temperature is less than 200° C., conducting a gas heated to 300° to 400° C. into said adsorbing tower saturated with ammonia adsorption so as to desorb ammonia by heating, and decomposing ammonia by conducting the ammonia-desorbed gas into an ammonia decomposition tower containing an ammonia decomposition catalyst which is disposed on an ammonia desorption line that is installed separately from the main stream of the dry denitration device.

5,589,147
CATALYTIC SYSTEM FOR THE REDUCTON OF NITROGEN OXIDES
Maria D. Farnos, Wilmington, Del.; John P. McWilliams, Woodbury, N.J.; Sanjay B. Sharma, Langhorne, Pa., and David S. Shihabi, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Jul. 7, 1994, Ser. No. 271,685
Int. Cl.[6] C01B *21/00*
U.S. Cl. 423—239.2 **11 Claims**

1. A method for treating an exhaust gas comprising NO_x and ammonia, said method comprising directing the exhaust gas along with a source of oxygen over a catalyst under treating conditions effective for the selective catalytic reduction of NO_x; said catalyst comprising a molecular sieve which has been physically mixed with a metal and a binder or a binder precursor under contacting conditions effective to produce a metal loading of about 0.01 wt. % to about 5 wt. % with reference to the molecular sieve; said molecular sieve being at least one selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-21, ZSM-22, ZSM-23, ZSM-35, ZSM-38, ZSM-48, ZSM-58, and combinations thereof, said binder or binder precursor comprising at least one selected from the group consisting of titania, zirconia, and silica; said process further comprising finished said catalyst in a humidified atmosphere under conditions effective to produce improved hydrothermal stability; the metal being selected from the group consisting of at least one of the Groups of the Periodic Table of IIIA, IB, IIB, VA, VIA, VIIA, VIIIA, and combinations thereof.

5,589,148
PROCESS FOR PURIFYING HALOGEN-CONTAINING GAS
Kenji Otsuka; Hideki Fukuda, and Satoshi Arakawa, all of Hiratsuka, Japan, assignors to Japan Pionics Co., Ltd., Tokyo, Japan
Filed Aug. 23, 1995, Ser. No. 518,240
Claims priority, application Japan, Oct. 5, 1994, 6-266382
Int. Cl.[6] C01B *7/07*
U.S. Cl. 423—240 S **19 Claims**

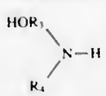
1. A process for purifying a halogen-containing gas which comprises bringing said halogen-containing gas into contact with a purifying agent comprising a hydroxide of an alkaline earth metal and an iron oxide to remove at least one member selected from the group consisting of hydrogen halogenides and moisture that are contained as impurities in said halogen-containing gas.

5,589,149
PROCESS FOR ABSORPTION OF MERCAPTANS
Paul Garland, Aylesbury, United Kingdom; Craig N. Schubert; Richard A. Gregory, both of Belle Mead, N.J.; Eduardo Garcia-Rameau; Rickey Epps, both of Houston, Tex.; David Burns, and Robert J. Hlozek, both of The Woodlands, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Continuation of Ser. No. 149,077, Nov. 9, 1993, abandoned. This application Jul. 12, 1995, Ser. No. 501,702
Int. Cl.[6] B01D *53/48*
U.S. Cl. 423—242.4 **14 Claims**

1. A process for removing mercaptans having from 1 to about 8 carbon atoms per molecule from a feed gas stream containing the mercaptans, said mercaptans including methyl mercaptan said process comprising:
(a) passing the feed gas stream to an absorption zone wherein the feed gas stream is contacted with a lean solvent stream containing an absorption solvent comprising;
(i) from about 10 to 98 weight percent based on the weight of the absorption solvent on an anhydrous basis of an alkyl ether of a polyethylene glycol of the formula:

$$R_1—O—(CH_2CH_2O)_x—R_2$$

wherein;
R_1 is an alkyl group having 1 to about 4 carbon atoms;
R_2 is hydrogen or an alkyl group having 1 to about 4 carbon atoms; and
x is 2 to about 10;
(ii) from 1 to about 20 weight percent based on the weight of the absorption solvent on an anhydrous basis of a secondary monoalkanol amine of the formula:



wherein;
R_3 is an alkylene group having 1 to about 6 carbon atoms; and
R_4 is an alkyl group having 1 to about 4 carbon atoms;
(iii) from about 10 to about 60 weight percent of a dialkanol amine based on the weight of the absorption solvent on an anhydrous basis; and
(iv) from about 0.1 to 80 weight percent water based on the total weight of the absorption solvent;

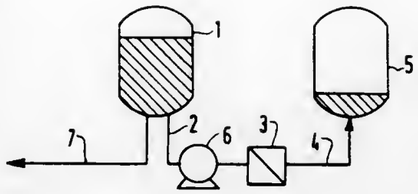
said absorption solvent being further characterized by having less than 0.005 moles of iodine per liter of absorption solvent;
(b) discharging a product gas stream at least about 90% depleted in methyl mercaptan relative to the feed gas stream from the absorption zone;
(c) discharging a rich solvent stream comprising the absorption solvent and at least a portion of the mercaptans from the absorption zone;
(d) passing at least a portion of the rich solvent stream to a regeneration zone wherein absorbed mercaptans are desorbed from the rich solvent stream;
(e) discharging a tail gas stream comprising mercaptans from the regeneration zone;
(f) discharging a regenerated solvent stream comprising said absorption solvent; and
(g) recycling at least a portion of the regenerated solvent stream to the absorption zone to comprise at least a portion of the lean solvent stream.

5,589,150
METHOD FOR PREPARING SPHERULAR SILICA GEL PARTICLES
Jiro Kano, Hyuga, Japan; Ryuji Orii, Corvallis, Oreg.; Yuzo Horinouchi, Nobeoka, and Mutsuhiro Ito, Hyuga, both of Japan, assignors to Fuji-Davison Chemical Ltd., Aichi-ken, Japan
Continuation of Ser. No. 556,898, Jul. 23, 1990, abandoned. This application Mar. 4, 1992, Ser. No. 845,528
Int. Cl.[6] C01B *33/12*
U.S. Cl. 423—338 **24 Claims**

1. A method for preparing spherular silica gel particles comprising the steps of:
preparing a silica hydrosol from alkali metal silicate and mineral acid;
allowing the silica hydrosol to form a silica hydrogel;
preparing a slurry containing the silica hydrogel;
controlling the moisture in the slurry to 0.2 to 1.5 times the weight of the silica hydrogel particles in the slurry by adding water wherein the concentration of the components of the slurry determines the strength of the silica gel particles;
adjusting the pH of the slurry to a pH of 1 to 3;
wet-grinding the silica hydrogel particles at said slurry moisture content and pH; and
spray-drying the wet-ground silica hydrogel particles to produce silica gel particles;
said silica gel particles having a particle strength in the range of 1 to 4.

5,589,151
PROCESS FOR THE PREPARATION OF HIGH-PURITY LIQUID NITROGEN
Daniel Gary, Versailles, France, assignor to L'Air Liquide Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France
Continuation-in-part of Ser. No. 230,500, Apr. 20, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 378,447
Claims priority, application France, Dec. 31, 1993, 93 15958; European Pat. Off., Dec. 22, 1994, 94402
Int. Cl.[6] G01B *21/00*
U.S. Cl. 423—351 **36 Claims**

1. Process for the preparation of high purity liquid nitrogen substantially free from at least one impurity selected from the group consisting of hydrogen, carbon monoxide and oxygen, comprising placing liquid nitrogen to be purified in contact with at least one adsorbent selected from the group consisting of non-ion exchanged zeolites, zeolites exchanged with at least one ion of a transition metal, and porous metal oxides, said adsorbent adsorbing at least one said impurity, and recovering said high purity liquid



nitrogen, with the proviso that a process wherein the at least one adsorbent is a non-ion exchanged zeolite and the at least one impurity to be adsorbed is carbon monoxide is excluded.

5,589,152
CARBON FIBRILS, METHOD FOR PRODUCING SAME AND ADHESIVE COMPOSITIONS CONTAINING SAME
Howard G. Tennent, Kennett Square, Pa.; James J. Barber, Arlington, Mass., and Robert Hoch, Middle Village, N.Y., assignors to Hyperion Catalysis International, Inc., Cambridge, Mass.
Continuation of Ser. No. 978,634, Nov. 19, 1992, abandoned, which is a division of Ser. No. 593,319, Oct. 1, 1990, Pat. No. 5,165,909, which is a continuation of Ser. No. 871,676, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 678,701, Dec. 6, 1984, Pat. No. 4,663,230. This application Jun. 6, 1995, Ser. No. 466,878
Int. Cl.[6] D01F *9/12*
U.S. Cl. 423—447.3 **28 Claims**

1. A fibril mat comprising a plurality of carbon fibrils formed by collecting said fibrils to form a mat, wherein each of said fibrils is characterized by a substantially constant diameter, length greater than about 5 times the diameter, an ordered outer region of catalytically grown, multiple, substantially continuous layers of ordered carbon atoms having an outside diameter between about 3.5 and 70 nanometers, and a distinct inner core region, each of the layers and the core being disposed substantially concentrically about the cylindrical axis of the fibril, wherein each of said fibrils is substantially free of pyrolytically deposited thermal carbon and the diameter of said fibril being equal to the outside diameter of said ordered outer region.

5,589,153
SYNTHESIS OF CRYSTALLINE POROUS SOLIDS IN AMMONIA
Juan M. Garces; Dean M. Millar, and Kevin E. Howard, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 333,670, Nov. 3, 1994. This application Jun. 2, 1995, Ser. No. 460,166
Int. Cl.[6] C01B *37/02*
U.S. Cl. 423—705 **2 Claims**

1. A crystalline microporous silica having an composition represented by

$$SiO_2:y'(CH_3)_3N:n'H_2O$$

wherein y' is a number ranging from 0 to about 0.5 and n' is a number ranging from 0 to about 1, the silica being isostructural with zeolite beta as determined by X-ray diffraction.

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5,589,154

METHODS FOR THE PREVENTION OR TREATMENT OF VASCULAR HEMORRHAGING AND ALZHEIMER'S DISEASE

Stephen Anderson, Princeton, N.J., assignor to Rutgers, The State University of New Jersey, Piscataway, N.J.

Filed Nov. 22, 1994, Ser. No. 347,144
Int. Cl.[6] A61K *51/00;39/395;35/14;* G01N *33/53*
U.S. Cl. 424—1.41 5 Claims

1. A method for diagnosing the presence of β-amyloid peptide in an individual, which comprises administering to said individual a labeled agent that specifically binds to β-amyloid peptide, in an amount sufficient to permit the detection of any of said β-amyloid peptide that binds to said agent, wherein said agent is a tissue plasminogen activator analog that binds β-amyloid peptide or binds fibrils containing β-amyloid peptide, but which does not bind fibrin.

5,589,155

MUTAGENESIS TESTING USING TRANSGENIC NON-HUMAN ANIMALS CARRYING TEST DNA SEQUENCES

Joseph A. Sorge, San Diego, and Jay M. Short, Encinitas, both of Calif., assignors to Union Bank of California, N.A., San Francisco, Calif.

Continuation of Ser. No. 947,947, Sep. 18, 1992, abandoned, which is a continuation of Ser. No. 505,676, Apr. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 45,037, May 1, 1987, abandoned. This application Mar. 6, 1995, Ser. No. 398,933
Int. Cl.[6] A61K *49/00;* C12N *15/00*
U.S. Cl. 424—9.2 6 Claims

1. A method for testing the mutagenic potential of an agent comprising:

(a) exposing a transgenic mouse to an agent to be tested, said transgenic mouse comprising somatic and germ cells containing an integrated transgenic test DNA sequence, said test DNA sequence being flanked by the cos sites of a lambda bacteriophage and recoverable from said cells via said cos sites, the expression of said test DNA sequence being capable of detection in *E. coli* by bioassay, wherein said test DNA sequence encodes a protein selected from the group consisting of LacZ and LacI;

(b) isolating a sample of genomic DNA from said exposed transgenic mouse;

(c) treating said sample of genomic DNA with a lambda bacteriophage packaging extract to excise said integrated transgenic test DNA sequence and then package said excised test DNA sequence;

(d) infecting *E. coli* with said packaged test DNA sequence;

(e) determining by bioassay in said infected *E. coli* the frequency of mutation of said test DNA sequence.

5,589,156

PRILOCAINE AND HYDROFLUOUROCARBON AEROSOL PREPARATIONS

Richard A. Henry, 7 Toronto Street, Kingston, Ontario, Canada

Continuation-in-part of Ser. No. 408,877, Mar. 24, 1995, and Ser. No. 236,408, May 2, 1994, Pat. No. 5,453,445, and Ser. No. 405,930, Mar. 17, 1995. This application May 5, 1995, Ser. No. 435,812
Int. Cl.[6] A61K *9/12*
U.S. Cl. 424—45 29 Claims

1. An aerosol composition for delivering topical local anesthetic to a mammal, comprising:

1–99% wt of hydrofluorocarbon propellant selected from the group consisting of 1,1,1,2-tetrafluoroethane and 1,1,1,2,3,3,3-heptafluoropropane and combinations thereof, said hydrofluorocarbon propellant being the sole propellant in said aerosol composition;

1–99% wt prilocaine base solubilized within said hydrofluorocarbon propellant, said prilocaine base and said hydrofluorocarbon propellant forming a solution that is stable at reduced temperature of at least −82° C.; and

0.01–99% wt of a pharmaceutical other than prilocaine solubilized in said hydrofluorocarbon propellant selected from the group consisting of bronchodilators, antiinflammatories, antitusives, vasoactive drugs, vasoconstrictors, antibiotics which are not antiseptics, peptides which are not enzymes, steroids, enzymes, antihistamines, hormones, 5-aminolevulinic acid, antiseptics, disinfectants, procaine, cocaine, chloroprocaine, tetracaine, mepivacaine, lidocaine, bupivacaine, etidocaine, ropivacaine, benzocaine, and phenylephrine.

5,589,157

HAIRSPRAYS AND ACRYLIC POLYMER COMPOSITIONS FOR USE THEREIN

James C. Hatfield, St. Albans, W. Va., assignor to Amerchol Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 953,496, Sep. 29, 1992, Pat. No. 5,413,775. This application May 8, 1995, Ser. No. 437,038
Int. Cl.[6] A61K *7/11;7/075;9/16;* C08F *218/10*
U.S. Cl. 424—47 16 Claims

1. In an aqueous polymer composition comprising:

(1) a copolymer of (a) an alkyl acrylate wherein the alkyl group contains from 1 to 5 carbon atoms; (b) an alkyl methacrylate wherein the alkyl group contains from 1 to 5 carbon atoms; and (c) at least one acrylate acid having from 3 to 5 carbon atoms; and

(2) water;

the improvement wherein the polymer composition further comprises an alkoxylated surfactant having a surface tension of from greater than about 32.2 dynes/cm to less than about 48.2 dynes/cm and a residual level of said alkyl acrylate of less than 100 ppmw.

5,589,158

FLAVOR ENHANCER

Amrit S. Mankoo, New Hampton, N.Y., assignor to Bush Boake Allen Inc., Montvale, N.J.

Filed Nov. 17, 1994, Ser. No. 340,930
Int. Cl.[6] A61K *7/16*
U.S. Cl. 424—49 13 Claims

1. A flavor enhancing composition comprising:

between about 30% and 90% by weight benzyl benzoate; and,

between about 3% and 15% by weight neryl acetate.

5,589,159

DISPERSIBLE PARTICULATE SYSTEM FOR DESENSITIZING TEETH

Kenneth Markowitz, Fanwood, and Mikhail Y. Gelfer, Jersey City, both of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Filed Apr. 11, 1995, Ser. No. 419,816
Int. Cl.[6] A61K *7/16;7/18;47/04*
U.S. Cl. 424—49 16 Claims

1. In a composition for treating hypersensitive teeth comprising an effective desensitizing amount of a desensitizing agent and a carrier therefor, the improvement which comprises the desensitizing agent being hectorite clay.

5,589,160

DENTIFRICE COMPOSITIONS

David E. Rice, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 2, 1995, Ser. No. 434,149
Int. Cl.[6] A61K *7/16;7/18*
U.S. Cl. 424—49 10 Claims

1. A dentifrice composition, comprising:

A). a precipitated silica abrasive composition, comprising:

a.) a low or medium structure, precipitated silica, comprising particles wherein said particles have:

i.) a mean particle size of from about 5 to about 11 microns (s.d.< 9);

ii.) an Einlehner hardness of from about 0.8 to about 2.5 for abrasive to brass screen and from about 5 to below about 8 for abrasive to polyester screen;

iii.) an oil absorption of from 95 ml/100 gm to about 135 ml/100 gm; and

iv.) a radioactive dentin abrasion of from about 25 to about below 80;

and

b.) a low or medium structure, precipitated silica, comprising particles wherein said particles have:

i.) a mean particle size of from about 5 to about 11 microns (s.d.< 9);

ii.) an Einlehner hardness of from about 3 to about 8 for abrasive to brass screen and from 8 to about 11 for abrasive to polyester screen;

iii.) an oil absorption of from about 70 ml/100 gm to about below 95 ml/100 gm; and

iv) a radioactive dentin abrasion of from 80 to about 200 wherein at least about 70% of all of said particles have a diameter of below about 25 microns and wherein the pellicle cleaning ratio is from about 90 to about 135 and the radioactive dentin abrasion is from about 60 to about 100 with a pellicle cleaning ratio/radioactive dentin abrasion ratio of from about 1.25 to about 1.75 and wherein the ratio of the silica in a.) to the silica in b.) is from about 90:10 to about 40:60, respectively;

and

B). from about 0.1% to about 99% of an orally-acceptable dentifrice carrier.

5,589,161

PIGMENTATION ENHANCER AND METHOD

Bryan B. Fuller, Edmond, Okla., assignor to The Board of Regents of the University Oklahoma, Norman, Okla.

Continuation of Ser. No. 943,998, Sep. 11, 1992, which is a continuation of Ser. No. 451,420, Dec. 15, 1989. This application Sep. 8, 1994, Ser. No. 302,153
Int. Cl.[6] A61K *7/42;7/40*
U.S. Cl. 424—59 12 Claims

1. A composition of matter for stimulating melanogenesis in melanocytes of human epidermis, comprising:

an effective amount of a methylxanthine effective in increasing tyrosinase activity in the melanocytes to an amount sufficient to result in increasing levels of melanin in a human melanocyte in vivo; and

an effective amount of a pharmaceutically acceptable topical carrier capable of delivering the methylxanthine to the melanocyte under in vivo conditions.

5,589,162

HAIR SETTING AGENT COMPOSITION

Tsutomu Muraoka, Tokyo, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 425,062
Claims priority, application Japan, Apr. 28, 1994, 6-091315
Int. Cl.[6] A61K *7/11;7/06*
U.S. Cl. 424—70.12 6 Claims

1. A hair setting agent composition comprising:

(A) 0.01 to 10% by weight of a water-dispersible polyester resin having a $—SO_3M$ group in which M is a hydrogen or metal ion in an amount sufficient to render the polyester dispersible in water;

(B) 0.01 to 10% by weight of at least one silicone derivative selected from the group consisting of a polyether-modified silicone, a dimethyl polysiloxane, a methylphenyl polysiloxane, a diphenyl polysiloxne, a C_{10-50} alkyl-modified silicone, an alkoxy-modified silicone, an amino-modified silicone, a Bunte salt-modified silicone and a silicone resin; and

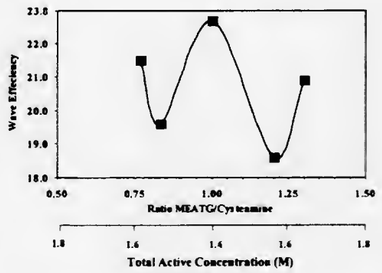
(C) 0.1 to 40% by weight of a C_{12-20} hydrocarbon oil.

5,589,163

PERMANENT WAVE COMPOSITION AND METHOD

Paul Neill, Hinsdale; Loralei Brandt, Cary; Priscilla Walling, Darien; Arun Nandagiri, Libertyville, and Norman Meltzer, Morton Grove, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 194,076, Feb. 9, 1994, abandoned. This application Dec. 14, 1994, Ser. No. 355,653
The portion of the term of this patent subsequent to Feb. 9, 2014, has been disclaimed.
Int. Cl.[6] A61K *7/09;7/06*
U.S. Cl. 424—70.51 12 Claims



1. A composition capable of breaking sulfur to sulfur bonds in human hair when in contact with said human hair so that said hair can be reconfigured, comprising an aqueous solution containing an ionic complex formed from a cationic compound, in solution, and an anionic compound, in solution, at a molar ratio of cationic compound to anionic compound of about 1:1, said aqueous solution having a pH of about 7 and having no acid that interferes with ionic complexing of said cationic and anionic compounds at the pH of the composition, thereby reducing the waving efficiency;

wherein the cationic compound, in solution, forms a cation of cysteamine; and

wherein the anionic compound, in solution, forms a thioglycolate anion.

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STABILIZATION OF BIOWASTES

James P. Cox, and Robert W. Duffy Cox, both of 246 E. Bartlett Rd., Lynden, Wash. 98264

Continuation-in-part of Ser. No. 287,183, Aug. 8, 1994, abandoned, which is a continuation of Ser. No. 886,417, May 19, 1992, Pat. No. 5,352,444. This application Jun. 7, 1995, Ser. No. 476,268

Int. Cl.[6] A61L *11/00*

U.S. Cl. 424—76.5 **51 Claims**

1. A biowaste treatment agent comprising a surfactant component, a metal component, and an aldehyde;

said surfactant component comprising about 1.0% to about 99.0% by weight of the treatment agent;

said metal component comprising a source of aluminum, and said metal component comprising from about 0.5% to about 85.0% by weight of the treatment agent; and

said aldehyde comprising about 0.1% to about 80.0% by weight of the treatment agent.

5,589,165

COSMETIC

Masashi Yoshida; Tomiyuki Nanba; Keiichi Uehara; Osamu Sakurai; Hideki Takahashi, and Hiroshi Fukui, all of Yokohama, Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,598

Claims priority, application Japan, Dec. 28, 1993, 5-353169

Int. Cl.[6] A61K *31/74;7/027*

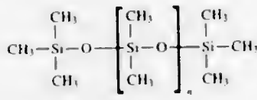
U.S. Cl. 424—78.03 **4 Claims**

1. A cosmetic, comprising an organofluorated modified silicone resin comprising units (1), (2) and (3) as shown below:

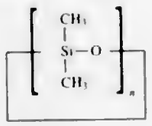
(1) $R_3SiO_{1/2}$ units

(2) SiO_2 units

(3) Rf_2SiO units and/or $RfSiO$ units wherein R denotes a hydrocarbon group with a carbon number of 1–6 or a phenyl group, and Rf denotes $-(CH_2)_mC_nF_{2n+1}$), m is an integer 2–4, and n is an integer 1–12, said cosmetic being selected from the group consisting of oil foundations, liquid foundations, liquid lip color, hand cream, mascara, pre-makeup, sunscreen, and powder foundations, said cosmetic further comprising at least one component selected from the group consisting of water, perfume, coloring agent(s), and powder, wherein the organofluorated modified silicone resin is blended into the cosmetic with one or more silicone oils selected from the group consisting of



wherein n denotes an integer 0–5, and



wherein n denotes an integer 3–7.

5,589,166

CROSS-LINKED QUATERNARY AMMONIUM DERIVATIVES OF POLY(N,N-DIALKYLALLYL) AMMONIUM POLYMERS

Fergus McTaggart, Wilmslow; Denis Pemberton, Stockport, and Graham J. Smith, Macclesfield, all of United Kingdom, assignors to Zeneca Limited, London, United Kingdom

Division of Ser. No. 252,521, Jun. 1, 1994, Pat. No. 5,462,730, which is a continuation of Ser. No. 804,131, Dec. 6, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 465,006

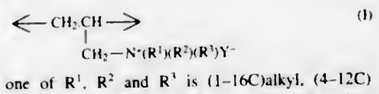
Claims priority, application United Kingdom, Dec. 7, 1990, 9026616; May 10, 1991, 9110180

Int. Cl.[6] C08F *8/02;126/02;* **C08J** *3/24*

U.S. Cl. 424—78.35 **11 Claims**

1. An insoluble swellable polymeric allylammonium derivative D1 comprising in random order:

(i) at least 10 mole percent of quaternary propylammonium structural units of formula I:



(I)

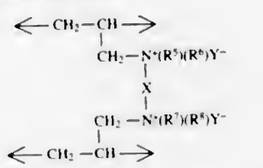
wherein one of R^1, R^2 and R^3 is (1–16C)alkyl, (4–12C) cycloalkyl or phenyl-(1–4C)alkyl, the latter phenyl moiety optionally bearing one or two substituents independently selected from the group consisting of halogeno, (1–4C)alkyl and (1–4C) alkoxy;

another of R^1, R^2 and R^3 is (1–4C)alkyl; and

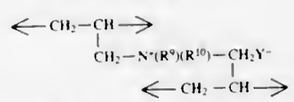
the other of R^1, R^2 and R^3 is (1–4C)alkyl optionally bearing a carbamoyl substituent, or is (2–4C)alkyl bearing a hydroxy substituent on other than an α-carbon atom; and

Y is a physiologically acceptable anion;

(ii) about 0.5 to 10 mole percent of cross-linking structural units of formula IIa and/or IIb:



(IIa)



(IIb)

wherein R^5, R^6, R^7 and R^8 are independently hydrogen or one of the values of R^1, R^2 and R^3 defined above;

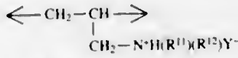
one of R^9 and R^{10} is hydrogen or (1–4C)alkyl;

the other of R^9 and R^{10} has one of the values of R^1, R^2 and R^3 defined above;

Y has the meaning defined above; and

X is a cross-linking group; and

(iii) the remainder of structural propylamine units of formula III:



(III)

R^{11} and R^{12} are independently hydrogen or one of the values of R^1, R^2 and R^3 defined above; and

Y has the meaning defined above;

said derivative D1 having the property of swelling by between about 2 and 200 times in volume in at least one of water, 0.15M aqueous sodium chloride solution, and ethanol.

5,589,167

EXCIPIENT STABILIZATION OF POLYPEPTIDES TREATED WITH ORGANIC SOLVENTS

Jeffrey L. Cleland, San Carlos, and Andrew J. S. Jones, San Mateo, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

PCT No. PCT/US94/01666, § 371 Date Apr. 8, 1994, § 102(e) Date Apr. 8, 1994, PCT Pub. No. WO94/19020, PCT Pub. Date Sep. 1, 1994

Continuation-in-part of Ser. No. 21,421, Feb. 23, 1993, abandoned. This PCT application Feb. 17, 1994, Ser. No. 256,187

Int. Cl.[6] A61K *38/21;38/27*

U.S. Cl. 424—85.7 **16 Claims**

1. A method of stabilizing a polypeptide against denaturation in an organic solvent when treated with the organic solvent, wherein the method comprises admixing the polypeptide with a polyol, wherein the molecular weight of the polyol is less than about 70,000 kD and is trehalose, to form an admixture; and treating the admixture with the organic solvent.

5,589,168

PROBIOTIC

William D. Allen; Margaret A. Linggood, and Philip Porter, all of Bedford, Great Britain, assignors to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

Continuation of Ser. No. 864,992, Apr. 8, 1992, abandoned. This application Sep. 2, 1994, Ser. No. 300,207

Claims priority, application United Kingdom, Apr. 8, 1991, 9107305

Int. Cl.[6] C12R *1/46;* **A61K** *35/74;* **A23C** *9/12*

U.S. Cl. 424—93.4 **4 Claims**

1. Organisms of *Enterococcus faecium* selected from the group consisting of strain NCIMB 40371 and IBS-alleviating mutants thereof.

5,589,169

METHOD AND THERAPEUTIC COMPOSITIONS FOR THE PREVENTION OF FIBRIN DEPOSITION OR ADHESIONS

Marjorie A. Mohler, Oakland, and Tue H. Nguyen, San Mateo, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 125,319, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 68,872, Jul. 1, 1987, abandoned. This application Apr. 13, 1990, Ser. No. 511,838

Int. Cl.[6] A61K *38/49*

U.S. Cl. 424—94.2 **10 Claims**

1. The method of treating an animal to prevent fibrin deposition or adhesion formation or reformation comprising administration of a composition to a site of potential fibrin or adhesion formation consequent to the animal undergoing surgery wherein the composition comprises a therapeutically effective amount of a sparingly soluble form of tissue plasminogen activator as a precipitated solid molecular form that is continuously released at that site for a period of time of about three days to two weeks.

5,589,170

CALCIUM INDEPENDENT CYTOSOLIC PHOSPHOLIPASE A_2/B ENZYMES

Simon Jones, Somerville, and Jin Tang, Canton, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Division of Ser. No. 281,193, Jul. 27, 1994, Pat. No. 5,466,595. This application Apr. 14, 1995, Ser. No. 422,106

Int. Cl.[6] A61K *38/46;* **C12N** *9/20;* **C07H** *21/04*

U.S. Cl. 424—94.6 **9 Claims**

1. A composition comprising a purified phospholipase enzyme characterized by (a) activity in the absence of calcium; (b) a molecular weight of 86 kD on SDS-PAGE; and (c) the presence of one or more amino acid sequences selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 1, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, wherein Xaa represents any amino acid residue.

5,589,171

TREATMENT OF DUPUYTREN'S DISEASE WITH COLLAGENASE

Thomas L. Wegman, North Merrick, N.Y., assignor to Advance Biofactures of Curacao, Brievengat, Netherlands Antilles

Filed Aug. 22, 1994, Ser. No. 294,097

Int. Cl.[6] A61K *38/48*

U.S. Cl. 424—94.67 **7 Claims**

1. A method of treating an individual suffering from Dupuytren's disease which comprises applying an effective amount of collagenase to a fibrous of the affected fascia.

5,589,172

Patent Not Issued For This Number

5,589,173

METHOD AND THERAPEUTIC COMPOSITIONS FOR THE TREATMENT OF MYOCARDIAL INFARCTION

Donogh P. O'Brien, Harrow, England; Gordon A. Vehar, San Carlos, and Josiah N. Wilcox, Belmont, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 76,280, Jun. 11, 1993, which is a continuation of Ser. No. 887,575, May 18, 1992, abandoned, which is a continuation of Ser. No. 237,595, Aug. 25, 1988, abandoned, which is a continuation of Ser. No. 209,665, Jun. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 110,255, Oct. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 926,977, Nov. 4, 1986, abandoned. This application Jun. 16, 1994, Ser. No. 260,662

Int. Cl.[6] C07K *16/36;14/745;* **A61K** *39/395*

U.S. Cl. 424—145.1 **14 Claims**

1. A method for dissolving and preventing reformation of an occluding thrombus precipated by rupture of and atheorosclerotic plaque in a mammal in need thereof comprising, adminstering to said mammal a tissue factor protein antagonist which neutralizes the procoagulant activity of tissue factor in an amount effective to prevent the reformation of the occluding thrombus and a thrombolytic agent in an amount effective to dissolve the occluding thrombus.

5,589,174

ANTI-HUMAN INFLUENZA VIRUS ANTIBODY

Yoshinobu Okuno, Toyonaka; Yuji Isegawa, Takatsuki; Fuyoko Sasao, Ibaraki, and Shigeharu Ueda, Nishinomiya, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto-fu, Japan

Continuation-in-part of Ser. No. 054,016, Apr. 29, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 229,781

Claims priority, application Japan, Sep. 17, 1992, 4-272538; Apr. 20, 1993, 5-115216; Mar. 16, 1994, 6-070194

Int. Cl.[6] A61K *39/395;* **C07K** *16/08;* **C12N** *5/20;15/06*

U.S. Cl. 424—147.1 **10 Claims**

1. An anti-human influenza virus antibody having the following characteristics:

(a) specifically binds to the stem region of hemagglutinin of human influenza A virus subtypes H1N1 and H2N2;

(b) does not specifically bind to the stem region of hemagglutinin of human influenza A virus subtype H3N2;

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(c) has a neutralization activity for human influenza A virus subtypes H1N1 and H2N2; and

(d) has no neutralization activity for human influenza A virus subtype H3N2.

5,589,175

PEPTIDES FOR INDUCTION OF NEUTRALIZING ANTIBODIES AGAINST HUMAN IMMUNODEFICIENCY VIRUS

Anders Vahlne, Hovas; Bo Svennerholm, Goteborg; Lars Rymo, Hovas; Stig Jeansson, and Peter Horal, both of Goteborg, all of Sweden, assignors to Syntello Vaccine Development KB, Goteborg, Sweden

Continuation of Ser. No. 8,092, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 589,422, Sep. 27, 1990, abandoned. This application Mar. 27, 1995, Ser. No. 410,384

Int. Cl.[6] A61K *39/21;39/12;38/14;* **C07K** *5/00*

U.S. Cl. 424—208.1 **8 Claims**

1. A composition consisting of a peptide of the amino acid sequence: X-Gly-Glu-Ile-Lys-Asn-Cys-Ser-Phe-Asn-Ile-Ser-Thr-Ser-Ile-Arg-Gly-Lys-Val-Gln-Lys-Glu-Tyr-Ala-Phe-Phe-Y-Z in an amount effective to elicit the production of antibodies to human immunodeficiency virus in a primate, wherein X is selected from the group consisting of a hydrogen atom of the amino terminal NH_2 group of the peptide and an additional amino acid selected to facilitate coupling; Y is absent or cysteine and Z is selected from the group consisting of the carboxyl group of the carboxy terminal amino acid and an amido group.

5,589,176

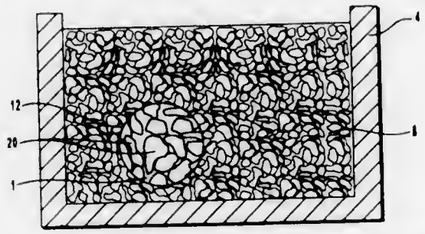
METHODS OF MAKING DOUBLY POROUS DEVICE

William J. Seare, Jr., 3190 Chula Vista Cir., Salt Lake City, Utah 84121

Division of Ser. No. 156,675, Nov. 22, 1993, which is a continuation of Ser. No. 779,387, Oct. 18, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,409

Int. Cl.[6] A61K *9/00*

U.S. Cl. 424—400 **25 Claims**



1. A method of forming a device having a first porous portion having continuously interconnected pores and a second porous portion having continuously interconnected pores, said method comprising the steps of:

(a) obtaining an open-cell porous mold form corresponding to the first porous portion, said open-cell porous mold form comprising particles formed into a mass of continuously interconnected particles and shaped and solidified to thereby define continuously interconnected pores and connecting interstices within said first porous portion;

(b) selectively forming a stable coating layer upon the surface of the particles of said mold form to thereby define continuously interconnected pores and connecting interstices within the second porous portion, said stable coating layer being formed by the steps of:

i) selectively filling said pores and interstices of said open-cell porous mold form with a selected coating material such that the open-cell porous mold form mass is maintained;

ii) selectively removing a substantial portion of said coating material such that a continuous coating of a selected thickness remains upon the particles of said open-cell porous mold form; and

iii) solidifying said coating material; and

(c) selectively removing the open-cell porous mold form such that the stable coating layer defines a membrane separating the first porous portion and the second porous portion of said device.

5,589,177

RINSE-OFF WATER-IN-OIL-IN-WATER COMPOSITIONS

Craig A. Herb, Chicago; Liang B. Chen, Hoffman Estates; Judy B. Chung, Glenview; Michelle A. Long, Lombard; Wei M. Sun, Palatine; Gerald P. Newell, Hoffman Estates; Kimberly Kamis, Glenview, and Richard M. Brucks, Chicago, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Dec. 6, 1994, Ser. No. 349,963

Int. Cl.[6] A61K *7/00;7/08;* **C07F** *7/08*

U.S. Cl. 424—401 **22 Claims**

1. A rinse-off water-in-oil-in-water multiple emulsion composition comprising:

(a) about 40% to about 99% by weight of the total composition of an external aqueous phase comprising water; and

(b) about 1% to about 60% by weight of the total composition of a primary water-in-oil emulsion, said primary emulsion comprising:

(i) about 1% to about 95% by weight of the primary emulsion of an aqueous phase, said aqueous phase comprising: (A) about 0.1% to about 30% by weight of the primary emulsion of a first topically-active compound selected from the group consisting of a hair fixative and a hair fixative resin and (B) water,

(ii) about 0.5% to about 95% by weight of the primary emulsion of an oil phase comprising a volatile silicone compound, and

(iii) about 0.1% to about 20% by weight of the primary emulsion of a surfactant phase comprising an oil-soluble silicon-based surfactant;

wherein the external aqueous phase is free of a polymeric gelling agent.

5,589,178

COSMETIC AND/OR DERMATOLOGICAL COMPOSITION FOR THE TREATMENT OF AGING, CONTAINING CERAMIDES, AND THE USE THEREOF

Lucien Aubert, Cap d'Ail, and Francoise Gagnebien-Cabanne, Chatillon, both of France, assignors to L'Oreal, Paris, France

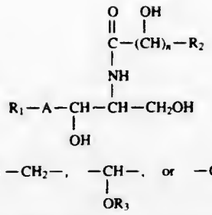
Filed Dec. 30, 1994, Ser. No. 366,760

Claims priority, application France, Jan. 10, 1994, 94 00173

Int. Cl.[6] A61K *6/00;31/615;31/19;31/16;31/07*

U.S. Cl. 424—401 **14 Claims**

1. A method for combating the aging of skin, comprising applying to the skin of a subject in need thereof and whose skin is sensitive to the action of an anti-aging active agent, an effective amount of a composition comprising at least one anti-aging active agent having an irritant effect, a cosmetically or dermatologically acceptable medium, and a mollifying agent which is a ceramide of formula (I):



(I)

wherein A is $-CH_2-$, $-\underset{\underset{OR_3}{|}}{CH}-$, or $-CH=CH-$;

R_1 is a saturated or unsaturated, linear or branched C_{10} to C_{26} alkyl group;

R_2 is a saturated or unsaturated, linear or branched C_{12} to C_{32} alkyl group;

R_3 is H or $-CO-CHOH-R_2$; and

n is 0 or 1.

5,589,179

COMPOSITION CONTAINING A NON-PHOTOCATALYTIC METAL OXIDE AND TOCOPHEROL, ITS USE IN THE COSMETICS AND/OR DERMATOLOGICAL FIELD AND PROCESSES EMPLOYING IT

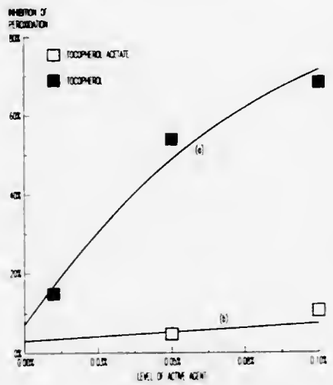
Boudiaf Boussouira, Paris, and Quang L. Nguyen, Antony, both of France, assignors to L'oreal, Paris, France

Filed Mar. 13, 1995, Ser. No. 402,655

Claims priority, application France, Mar. 11, 1994, 94 02882

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 **7 Claims**



1. A composition for inhibiting the photoperoxidation of unsaturated lipids, which comprises:

1) 0.02–6% by weight of at least one tocopherol selected from the group consisting of α-tocopherol, β-tocopherol, γ-tocopherol, δ-tocopherol and a mixture thereof;

2) 0.1–5% by weight of zinc oxide or dioxide; and

3) 0.005–0.3% by weight of a metal-inactivating complexing agent selected from the group consisting of ethylenediaminetetra(methylenephosphonic acid), diethylenetriaminepenta(methylenephosphonic acid), sodium salts thereof, and a mixture thereof.

5,589,180

METHOD FOR TREATING NERVE INJURY PAIN ASSOCIATED WITH SHINGLES (HERPES-ZOSTER AND POST-HERPETIC NEURALGIA) BY TOPICAL APPLICATION OF LIDOCAINE

Harry Hind, Los Altos, Calif., assignor to Hind Health Care, Inc., Los Altos, Calif.

Continuation of Ser. No. 388,375, Feb. 14, 1995, abandoned, which is a continuation of Ser. No. 198,223, Feb. 16, 1994, Pat. No. 5,411,738, which is a continuation-in-part of Ser. No. 526,771, May 18, 1990, which is a continuation of Ser. No. 325,373, Mar. 17, 1989, abandoned. This application Mar. 5, 1996, Ser. No. 611,168

Int. Cl.[6] A61F *13/00;13/15;* **A61L** *15/00;15/16*

U.S. Cl. 424—402 **6 Claims**

1. A plaster composition for treatment of pain from herpes zoster or post-herpetic neuralgia comprising:

a physiologically acceptable adhesive comprising 2–10% by weight lidocaine at least in part as the free base;

at least one of propylene glycol and glycerin as a co-solvent; and

a covering.

5,589,181

INSECT REPELLENT

Franz Bencsits, Wehrenbachhalde 54, 8053 Zürich, Switzerland, assignor to Franz Bencsits, and Perycut-Chemie AG, both of Switzerland

PCT No. PCT/EP93/00427, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO93/16594, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 24, 1993, Ser. No. 290,991

Claims priority, application Germany, Feb. 27, 1992, 42 06 090.7

Int. Cl.[6] A01N *25/02*

U.S. Cl. 424—405 **16 Claims**

1. An insect repellant consisting essentially of (a) an active substance combination of 1 to 99% by weight of at least one fatty acid alkyl ester having 1 to 4 carbon atoms in the alkyl group and 99 to 1% by weight of at least one natural, nature-identical or synthetic fatty alcohol having 5 to 18 carbon atoms in (b) a carrier of at least one natural or nature-identical normally liquid vegetal fatty oil selected from the group consisting of rape-seed oil, sunflower oil, peanut oil, soy oil, and coconut oil.

5,589,182

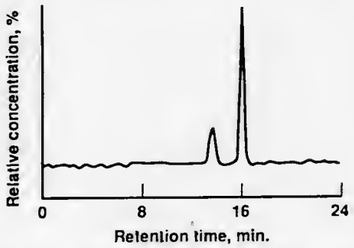
COMPOSITIONS AND METHOD OF TREATING CARDIO-, CEREBRO-VASCULAR AND ALZHEIMER'S DISEASES AND DEPRESSION

Renki Tashiro, Asahichyo 2-24-15, Fuchyu, Tokyo, Japan, and Ruth H. Pater, 106 Tuckahoe Trace, Yorktown, Va. 23693

Filed Dec. 6, 1993, Ser. No. 161,350

Int. Cl.[6] A61K *9/08;9/14;9/20;9/48;35/78*

U.S. Cl. 424—423 **35 Claims**



1. A pharmaceutical composition in unit dosage form suitable for the treatment of a condition selected from the group consisting of

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cardiovascular disease and cerebrovascular disease comprising a therapeutically effective amount of a member selected from the group consisting of:

I. a mixture of aqueous extracts of:

a. root tissue of the plant *Asparagus cochinchinensis* containing asparagine, β-sitosterol and 5-methoxymethylfurfural,

b. root tissue of the plant *Ophiopogon japonicus* containing glucose, starch, vitamin A and β-sitosterol,

c. root tissue of the plant *Salvia miltiorrhiza* containing tanshinone A $C_{18}H_{12}O_3$, tanshinone B $C_{19}H_{18}O_3$ and tanshinone C $C_{19}H_{20}O_3$,

d. root tissue of the plant *Angelica acutiloba kitagawa* containing ligustillide,

e. root tissue of the plant *Rehmannia glutinosa Liboschitz* containing rehmannin, xylitol, glucose, mannitol, iron, vitamin A and catalpol,

f. white stone-like material formed by bacteria on surface of underground root of tree *Poria cocos wolf* containing ergosterol,

g. ripe fruits of the plant *Schizandra chinensis* containing citral, schizandrin $C_{23}H_{32}O_6$, vitamin A, vitamin C and d-ylangene,

h. root tissue of the plant *Platycodon grandiflorum* containing polygalacic acid platycoside, inulin and phytosterol,

i. root tissue of the plant *Polygala tenuifolia* containing tenuifolin, polygallitol $C_6H_{12}O_5$ and onsicin $C_{24}H_{47}O_5$,

j. dried seeds of the plant *Zizyphus jujuba* containing betulinic acid $C_{30}H_{48}O_3$, betulin $C_{30}H_{50}O_2$, β-sitosterol, fatty acids, vitamin A and organic acids,

k. dried seeds of the plant *Biota orientalis* containing borneol and fatty acids,

l. root tissue of the plant *Pueraria pseudo-hirsuta* containing flavon, puerarin and daidzein,

m. root tissue of the plant *Panax ginseng* containing ginsenoside, panacene $C_{15}H_{24}$, panaquilon $C_{32}H_{56}O_{14}$, panaxin $C_{23}H_{38}O_{10}$, organic acids, vitamin A, vitamin B_1, vitamin B_2, vitamin C, inorganic salts and starch,

n. root tissue of the plant *Codonopsis pilosula* containing alkaloid, saponin, protein, starch, vitamin B_1 and vitamin B_2,

o. root tissue of the plant *Scrophularia ningpoensis* containing harpagide, phytosterol, linoleic acid and alkaloid,

p. root tissue of the plant *Glycyrrhiza uralensis* containing glycyrrhizic acid, calcium salt, potassium salt, glycyrrhizin, glycyrrhizic acid, liquiritigenin $C_{21}H_{22}O_4$, glucose, mannitol, malic acid and l-asparagine,

q. root tissue of the plant *Panax pseudo-ginseng* containing pseudo-ginseng A $C_{30}H_{52}O_{10}$, pseudo-ginseng B $C_{23}H_{38}O_{10}$ and flavon,

r. the whole plant *Ganoderma japonicum* containing amino acid, protein, sterol and alkaloid,

s. root tissue of the plant *Coptis chinensis* containing berberine $C_{20}H_{19}O_5N$, coptisine $C_{19}H_{15}O_5N$, palmatine $C_{21}H_{23}O_5N$ and woorenine $C_{20}H_{17}O_5N$,

t. flower heads of the plant *Chrysanthemum morifolium* containing adenine $C_5H_5N_5$, stachydrine $C_7H_{13}NO$, choline and oil, and

u. skins of the plant *Phellodendron amurense* containing berberine, obakunone $C_{26}H_{30}O_7$, obakulactone $C_{26}H_{30}O_8$ and dictamnolactone $C_{28}H_{30}O_9$;

II. a mixture of the aqueous extracts of:

I.a.,
I.b.,
I.c.,
I.d.,
I.e.,
I.f.,
I.g.,
I.h.,
I.i.,
I.k.,
I.l.,
I.m.,
I.n.,
I.o.,
I.p.,
I.q., and
I.r.;

III. a mixture of the aqueous extracts of:

I.a.,
I.b.,
I.c.,
I.d.,
I.e.,
I.f.,
I.g.,
I.h.,
I.i.,
I.k.,
I.l.,
I.m.,
I.o.,
I.p.,
I.r.,
I.s.,
I.t.; and

IV. a mixture of finely divided:

1. root tissue of the plant *Salvia miltiorrhiza* containing tanshinone A $C_{18}H_{12}O_3$, tanshinone B $C_{19}H_{18}O_3$ and tanshinone C $C_{19}H_{20}O_3$,

2. root tissue of the plant *Panax pseudo-ginseng* containing ginsenoside, panacene $C_{15}H_{24}$, panaquilon $C_{32}H_{56}O_{14}$, panaxin $C_{23}H_{38}O_{10}$, organic acids, vitamin A, vitamin B_1, vitamin B_2, vitamin C, inorganic salts and starch,

3. root tissue of the plant *Red ginseng* containing ginsenoside, panacene $C_{15}H_{24}$, panaquilon $C_{32}H_{56}O_{14}$, panaxin $C_{23}H_{38}O_{10}$, organic acids, vitamin A, vitamin B_1, vitamin B_2, vitamin C, inorganic salts and starch, and

4. Amber, a hard translucent fossil resin buried between roots of old trees, containing succinoabietinolic acid $C_{40}H_{64}O_5$, succinogiluinic acid $C_{24}C_{36}O_2$, succinoresinol, succinoabietinol $C_{40}H_{66}O$ and fatty acids,

wherein, in composition I, the weight percentage of each plant tissue, based on the total weight of said plants from which said mixture of aqueous extracts is derived, is in the range of:

from about 5% to about 20% of a.;
from about 5% to about 20% of b.;
from about 5% to about 20% of c.;
from about 5% to about 20% of d.;
from about 5% to about 20% of e.;
from about 5% to about 16% of f.;
from about 1% to about 15% of g.;
from about 1% to about 6% of h.;
from about 1% to about 10% of i.;
from about 1% to about 10% of j.;
from about 1% to about 10% of k.;
from about 1% to about 10% of l.;
from about 1% to about 10% of m.;
from about 1% to about 20% of n.;
from about 1% to about 15% of o.;
from about 0.1% to about 2% of p.;
from about 1% to about 15% of q.;
from about 1% to about 10% of r.;
from about 1% to about 5% of s.;
from about 1% to about 10% of t.; and
from about 1% to about 10% of u.;

wherein, in composition II, the weight percentage of each plant tissue, based on the total weight of said plants from which said mixture of aqueous extracts is derived, is in the range of:

from about 3% to about 15% of a.;
from about 3% to about 15% of b.;
from about 5% to about 20% of c.;
from about 3% to about 15% of d.;
from about 5% to about 20% of e.;
from about 5% to about 20% of f.;
from about 2% to about 15% of g.;
from about 1% to about 5% of h.;
from about 2% to about 15% of i.;
from about 2% to about 15% of j.;
from about 2% to about 5% of k.;

from about 2% to about 15% of l.;
from about 1% to about 10% of m.;
from about 2% to about 15% of n.;
from about 3% to about 15% of o.;
from about 0.1% to about 2% of p.;
from about 3% to about 15% of q.; and
from about 3% to about 15% of r.;

wherein, in composition III, the weight percentage of each plant tissue, based on the total weight of said plants from which said mixture of aqueous extracts is derived, is in the range of:

from about 5% to about 20% of a.;
from about 2% to about 10% of b.;
from about 2% to about 10% of c.;
from about 2% to about 10% of d.;
from about 2% to about 10% of e.;
from about 2% to about 10% of f.;
from about 2% to about 10% of g.;
from about 2% to about 4% of h.;
from about 2% to about 10% of i.;
from about 2% to about 10% of j.;
from about 1% to about 5% of k.;
from about 2% to about 10% of l.;
from about 2% to about 8% of m.;
from about 2% to about 15% of o.;
from about 0.1% to about 2% of p.;
from about 2% to about 10% of r.;
from about 1% to about 5% of s.; and
from about 1% to about 5% of t.;

and wherein, in composition IV, the weight percentage of each plant tissue, based on the total weight of said plants from which said mixture of finely divided tissue is derived, is in the range of:

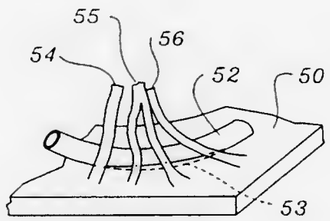
from about 20% to about 60% of 1.;
from about 20% to about 60% of 2.;
from about 10% to about 30% of 3.; and
from about 5% to about 20% of 4.

5,589,183

METHOD AND APPARATUS FOR TREATMENT OF NEUROGENIC DIABETES MELLITUS, AND OTHER CONDITIONS

Peter J. Jannetta, 214 Schenley Rd., Pittsburgh, Pa. 15217

Filed Oct. 5, 1995, Ser. No. 539,341
Int. Cl.[6] A61F *2/02*
U.S. Cl. 424—423 **25 Claims**



1. A method for relieving pressure from a preselected region of the brainstem within the cranium of a subject, the subject having a disorder of the normal neuroendocrine servomechanism, the pressure resulting from the compression of the region by a blood vessel, the method comprising the steps of:

a. gaining access to the preselected region using a first preselected surgical technique;

b. exposing the preselected region according to a second preselected surgical technique;

c. lifting the blood vessel from at least a portion of the region according to a third preselected surgical technique, thereby providing the pressure relief, the neuroendocrine servomechanism being responsive to the pressure relief on the region; and

d. inserting a neurovascular bridge implant between the blood vessel and the preselected region, the implant maintaining the pressure relief.

5,589,184

PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT OF THE CORNEA FOLLOWING LASER TREATMENT

Stella M. Robertson, Arlington, and Herman M. Kunkle, Jr., Mansfield, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 279,765, Jul. 25, 1994, Pat. No. 5,401,510, which is a continuation of Ser. No. 218,393, Mar. 28, 1994, abandoned, which is a division of Ser. No. 101,862, Aug. 4, 1993, Pat. No. 5,360,611, which is a continuation of Ser. No. 866,730, Apr. 10, 1992, Pat. No. 5,271,939, which is a continuation of Ser. No. 531,179, May 31, 1990, Pat. No. 5,124,392, which is a continuation-in-part of Ser. No. 253,009, Oct. 3, 1988, Pat. No. 4,939,135. This application Mar. 16, 1995, Ser. No. 405,466
Int. Cl.[6] A61F *9/00;* **A61K** *31/55;31/435;31/44*
U.S. Cl. 424—427 **7 Claims**

1. A method for treating a corneal wound caused by laser irradiation and resulting photoablation and volumetric removal of corneal tissue, comprising: applying to an affected cornea a composition containing between about 0.1 wt. % and 4.0 wt. % of an antiallergic selected from the group consisting of cyproheptadine, azelastine, cimetidine, cromolyn, lodoxamide and pheniramine and a pharmaceutically acceptable carrier therefor.

5,589,185

PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT OF THE CORNEA FOLLOWING LASER IRRADIATION

Stella M. Robertson, Arlington, and Herman M. Kunkle, Jr., Mansfield, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 279,765, Jul. 25, 1994, Pat. No. 5,401,510, which is a continuation of Ser. No. 218,393, Mar. 28, 1994, abandoned, which is a division of Ser. No. 101,862, Aug. 4, 1993, Pat. No. 5,360,611, which is a continuation of Ser. No. 866,730, Apr. 10, 1992, Pat. No. 5,271,939, which is a continuation of Ser. No. 531,179, May 31, 1990, Pat. No. 5,124,392, which is a continuation-in-part of Ser. No. 253,009, Oct. 3, 1988, Pat. No. 4,939,135. This application Mar. 16, 1995, Ser. No. 407,517
Int. Cl.[6] A61F *9/00;* **A61K** *33/04;31/355;31/34*
U.S. Cl. 424—427 **6 Claims**

1. A method for treating a cornea following laser irradiation and resulting photoablation and volumetric removal of corneal tissue, comprising: applying to the affected cornea a composition containing between about 0.001 nanograms per milliliter and 1.0 milligram per milliliter of an antioxidant selected from the group consisting of ascorbic acid, glutathione, alpha tocopherol, selenous acid and sodium selenate and a pharmaceutically acceptable carrier therefor.

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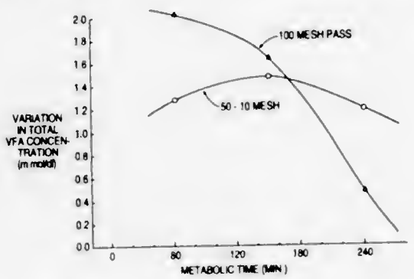
5,589,186

FEED COMPOSITION FOR RUMINANT ANIMALS AND METHOD OF FEEDING RUMINANT ANIMALS WITH THE SAME

Yoshio Isobe, Suginami-ku; Toshio Ito, Suita, and Fumio Shibata, Fujisawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 97,994, Jul. 29, 1993, abandoned.
This application Apr. 6, 1995, Ser. No. 418,165
Claims priority, application Japan, Jan. 29, 1993, 5-034381
Int. Cl.[6] A23K *1/18*
U.S. Cl. 424—438 14 Claims



1. A feed composition for ruminant animals which comprises
(a) 0.1 to 10 parts by weight of fumaric acid in a powdery or granular form having a mean particle diameter of not less than 75 mesh and
(b) 100 parts by weight of a ration comprising
(i) 90 to 10% by weight of a concentrate feed containing 30 to 80% by weight of cereals based on the total weight of the concentrated feed and
(ii) 10 to 90% by weight of roughage,
wherein said concentrate feed comprises at least one member selected from the group consisting of oil meals, feeds of animal origin, mineral feeds, vitamins, amino acids, and minerals, and
wherein said roughage comprises at least one member selected from the group consisting of plant stems, plant leaves, brans, and factory byproducts.

5,589,187

PROTECTIVE ENCAPSULATION OF MICRONUTRIENTS FOR INGESTION BY AVIAN SPECIES

Alice L. Wentworth, and Bernard C. Wentworth, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 7, 1995, Ser. No. 482,736
Int. Cl.[6] A61K *9/48*
U.S. Cl. 424—439 24 Claims

1. A method of encapsulating foodstuff additives comprising:
(a) coating a foodstuff additive with a first proteinaceous coating to form protein-coated grit particles; and
(b) encapsulating the protein-coated grit particles within an enzymatically indigestible plastic to form plastic-encapsulated grit particles having a plastic coating capable of being mechanically degraded within gizzards of avian species, and wherein the enzymatically indigestible plastic is selected from the group consisting of thermoplastic or thermosetting polyesters, polystyrenes, polyacrylates, co-polymers thereof, and combinations thereof.

5,589,188

Patent Not Issued For This Number

5,589,189

LIPOSOME DISPERSION

Karen L. Moynihan, Brea, Calif., assignor to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Filed Sep. 14, 1994, Ser. No. 306,036
Int. Cl.[6] A61K *9/127*
U.S. Cl. 424—450 4 Claims

1. A process for producing a non-aggregating dispersion of liposomes, comprising:
a) forming a dispersion of preformed liposomes containing an active therapeutic or an imaging agent;
b) adding a solution of a globular protein to the dispersion;
c) then subjecting the dispersion to a force sufficient to reduce the median size of the liposomes to less than 0.2 μm wherein the resulting liposomes are unilamellar, provided that when the globular protein is added prior to an initial application of force the dispersion comprises an aqueous solution having an ionic strength of below 50 mM; and
d) filtering the resulting liposomes through a filter having a size less than or equal to 0.45 μm,
wherein the protein is selected from the group consisting of albumin, immunoglobulin, alpha, beta or gamma globulin, a lipoprotein and mixtures thereof.

5,589,190

SUSTAINED-RELEASE COMPOSITIONS OF ALFUZOSIN HYDROCHLORIDE

Véronique Andrieu, Boulogne Billancourt; Jean Montel, Chatou, and Alexander Wick, Saint Nom La Bretèche, all of France, assignors to Synthelabo, Le Plessis Robinson, France

Filed Mar. 20, 1995, Ser. No. 406,405
Claims priority, application France, Mar. 21, 1994, 94 03257
Int. Cl.[6] A61K *31/505;9/24;9/32;9/58*
U.S. Cl. 424—462 14 Claims

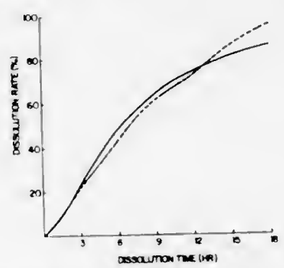
1. Dosage composition which comprises at least one coated core that contains alfuzosin hydrochloride, which core is coated with a coating that contains a polymer that is insoluble in acid and soluble at pH 7 or above, and at least one uncoated core containing alfuzosin hydrochloride.

5,589,191

SLOW-RELEASE SODIUM VALPROATE TABLETS

Tadashi Ukigaya, and Hirotaka Endoh, both of Saitama, Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 67,107, May 26, 1993, abandoned.
This application Jun. 7, 1995, Ser. No. 485,138
Claims priority, application Japan, May 29, 1992, 4-161785
Int. Cl.[6] A61K *9/36*
U.S. Cl. 424—480 5 Claims



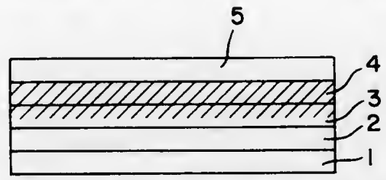
1. A slow-release sodium valproate tablet comprising a core and a coating covering the surface of said core, wherein said core comprises sodium valproate and said coating comprises a mixture of ethyl cellulose and silicic acid anhydride.

5,589,192

GEL PHARMACEUTICAL FORMULATION FOR LOCAL ANESTHESIA

Hideaki Okabe; Eiji Suzuki, both of Urawa; Masao Kogure, Saitama-ken, and Takanori Saito, Misato, all of Japan, assignors to Lintec Corporation, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 353,322
Claims priority, application Japan, Dec. 3, 1993, 5-339439
Int. Cl.[6] A61L *15/00*
U.S. Cl. 424—486 25 Claims



1. A pharmaceutical article comprising: a supporting substrate having on a surface thereof an aqueous gel coating consisting essentially of a local anesthetic and a gelled crosslinked copolymer of alkyl (meth)acrylate and (meth)acrylic acid, which impregnates the substrate, which article is produced by forming a polymer/drug matrix of the local anesthetic and an uncrosslinked copolymer corresponding to the crosslinked copolymer, applying a coating of the polymer/drug matrix and crosslinking agent for the copolymer to a surface of the substrate to impregnate the substrate therewith, crosslinking the copolymer in the coating to form the crosslinked copolymer, and contacting the surface of the coating with an aqueous fluid, thereby converting the coating into a gel.

5,589,193

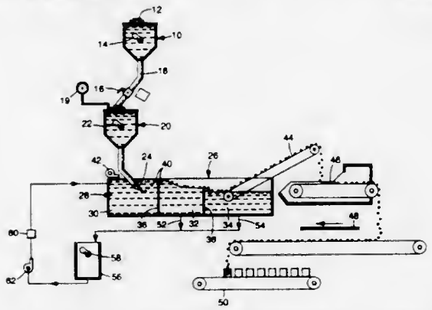
Patent Not Issued For This Number

5,589,194

METHOD OF ENCAPSULATION AND MICROCAPSULES PRODUCED THEREBY

Alexander C. Tsuel, Woodbury; Lorenz Kogl, III, Stillwater, and Daniel B. Pendergrass, Jr., Mendota Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 20, 1993, Ser. No. 123,806
Int. Cl.[6] A61K *9/50;* A23L *1/236;* A23P *1/04;* B01J *13/04*
U.S. Cl. 424—497 17 Claims



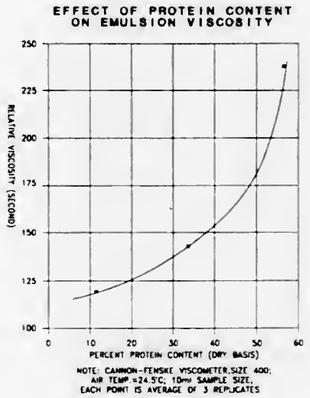
1. A process for encapsulating an active component comprising:
a) preparing an encapsulation composition by dispersing or dissolving said active component in a solid matrix-forming material that has been thermally softened to at least a pumpable state,
b) preparing a bath of a quenching liquid, said quenching liquid being substantially non-reactive with the active component and the solid matrix-forming material, and said quenching liquid being a poor solvent for the active component and the solid matrix-forming material, wherein at least a portion of said bath is at a temperature below the solidification temperature of said solid matrix-forming material,
c) injecting said encapsulation composition as an intact stream into said quenching liquid, and
d) allowing said encapsulation composition to break up into droplets and solidify in said quenching liquid to form microcapsules; wherein said solid matrix-forming material is selected from the group consisting of natural fatty alcohols, synthetic fatty alcohols, natural fatty acids, synthetic fatty acids, natural fatty esters, synthetic fatty esters, natural waxes, synthetic waxes, polyethylenes, polypropylenes, polyesters, polyvinyl chlorides, tristarch acetates, polyethylene oxides, polypropylene oxides, polyvinylidene chloride, polyvinylidene fluoride, polyvinyl alcohols, polyvinyl acetates, polyacrylates, polymethacrylates, vinyl functional polymers, urethanes, polycarbonates, polylactones and mixtures thereof.

5,589,195

FILM-FORMING PROTEINACEOUS EMULSION

Richard C. Potter, Seeley Lake, Mont., assignor to Nurture, Inc., Missoula, Mont.

Continuation of Ser. No. 505,126, Apr. 5, 1990. This application Mar. 21, 1994, Ser. No. 215,286
Int. Cl.[6] A61K *7/00;9/107*
U.S. Cl. 424—499 12 Claims



1. A method of forming a film on a surface, comprising:
providing an effective amount of a film-forming emulsion comprising an emulsifier consisting essentially of a proteinaceous particulate material derived from oat seed by a process that substantially alters the seed only by milling to a particle size range of about 0.1 microns to about 700 microns, physical separation of milled seed components to select a non-branny fraction that substantially passes through a 400 mesh screen, and organic solvent extraction, in combination with a lipophilic phase and an aqueous phase at room temperature, said proteinaceous particulate material functioning as the primary emulsifying agent;
applying said emulsion to a surface such that said emulsion forms a thin layer; and

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permitting the aqueous phase in said layer to evaporate, thereby forming a smooth, durable, dry film on said surface, wherein the formation of said film is attributable to said proteinaceous particulate material.

5,589,196

ANTIPERSPIRANT COMPOSITION

David T. Callaghan, Quincy; Alan M. Phipps, Framingham, both of Mass., and Stephen J. Provancal, Addison, Ill., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 846,016, Mar. 4, 1992, abandoned, which is a division of Ser. No. 287,096, Dec. 20, 1988, Pat. No. 5,114,705, which is a continuation of Ser. No. 713,470, Mar. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 523,785, Aug. 16, 1983, abandoned. This application Jun. 1, 1994, Ser. No. 252,376

Int. Cl.[6] **A61K** *33/24;7/32;* **C01G** *25/00;* **C01F** *7/00*

U.S. Cl. 424—617 **32 Claims**

1. An intermediate for making an antiperspirant composition having high efficacy, said intermediate comprising an aqueous solution of aluminum chlorhydroxide and zirconyl hydroxy chloride, the atomic ratio of Al to Zr being from 6:1 to 1:1, said solution, when stored at room temperature for no more than two hours and subjected to gel permeation chromatography at a concentration of 10% on cross-linked dextran having a molecular weight exclusion range of 1000 to 30,000 for globular proteins, showing a first peak at Kd=0.7 and a second peak at Kd=0.5, the ratio of the height of said first peak to that of said second peak being at least 1.5:1.

5,589,197

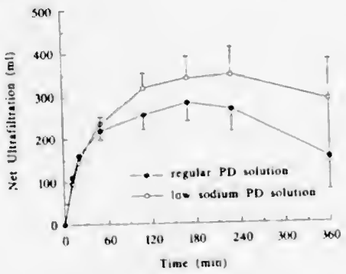
LOW SODIUM PERITONEAL DIALYSIS SOLUTION

Ty R. Shockley, Highland Park; Leo Martis, Long Grove; Lee W. Henderson, Lake Forest; John Moran, Evanston, all of Ill., and Masaaki Nakayama, Tokyo, Japan, assignors to Baxter International, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 130,968, Oct. 4, 1993, abandoned. This application Mar. 3, 1994, Ser. No. 205,304

Int. Cl.[6] **A61K** *31/70;31/715;33/00;33/14*

U.S. Cl. 424—663 **9 Claims**



1. A peritoneal dialysis solution for providing a sustained osmotic gradient comprising:

a polyglucose osmotic agent; and

sodium in a concentration that is less than a sodium plasma concentration in a renal patient who is to receive the solution.

5,589,198

TREATMENT OF IODINE DEFICIENCY DISEASES

Bernard A. Eskin, 625 Harvard Rd., Bala Cynwyd, Pa. 19004, and R. Alison Ghent, Kingston, Canada, assignors to 943038 Ontario, Inc., Ontario, Canada, and Bernard A. Eskin, Philadelphia, Pa.

Continuation-in-part of Ser. No. 131,427, Oct. 4, 1993, Pat. No. 5,389,385, which is a division of Ser. No. 803,550, Dec. 9, 1991, Pat. No. 5,250,304, which is a division of Ser. No. 292,968, Jan. 3, 1989, Pat. No. 5,171,582, which is a continuation-in-part of Ser. No. 889,947, Jul. 28, 1986, Pat. No. 4,816,255, which is a continuation-in-part of Ser. No. 760,950, Jul. 31, 1985, abandoned. This application Feb. 13, 1995, Ser. No. 388,026

Int. Cl.[6] **A01N** *59/22;* **A61K** *33/36*

U.S. Cl. 424—667 **11 Claims**

1. A method for therapeutically treating or preventing an iodine deficiency disease or disorder selected from the group consisting of fibrocystic dysplasia, breast cancer, endometriosis, ovarian cysts and premenstrual syndrome, comprising administering to a mammal in need thereof a sufficient amount of elemental iodine.

5,589,199

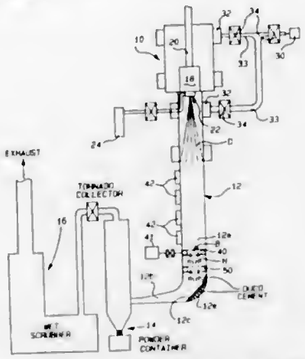
APPARATUS FOR MAKING ENVIRONMENTALLY STABLE REACTIVE ALLOY POWDERS

Iver E. Anderson; Barbara K. Lograsso, and Robert L. Terpstra, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 926,151, Aug. 5, 1994, Pat. No. 5,372,629, which is a continuation of Ser. No. 594,088, Oct. 9, 1990, abandoned. This application Oct. 24, 1994, Ser. No. 328,115

Int. Cl.[6] **B22F** *9/08*

U.S. Cl. 425—10 **5 Claims**



1. Apparatus for making powder from a melt having a composition including a reactive alloying element in selected concentration to provide desired end-use properties, comprising:

a) means for atomizing a melt having a composition including a reactive alloying element into molten droplets for free fall downwardly in a manner as to cool as they fall,

b) means for discharging a reactive gas downstream relative to the atomizing means for establishing a zone of said reactive gas downstream of the atomizing means at a selected location where the droplet temperature is so reduced by said cooling that said droplets have at least a solidified exterior and that the reactive gas reacts with said reactive alloying element as the droplets pass through the zone to form a reaction product layer thereon whose penetration into the droplets is limited in surface depth by the presence of said solidified surface so as to avoid selective removal of the reactive alloying element from said melt composition to a harmful level that substantially degrades the end-use properties of powder comprising said droplets, and

c) means for collecting the solidified droplets.

5,589,200

SPLIT MOLD APPARATUS FOR A TIRE VULCANIZER

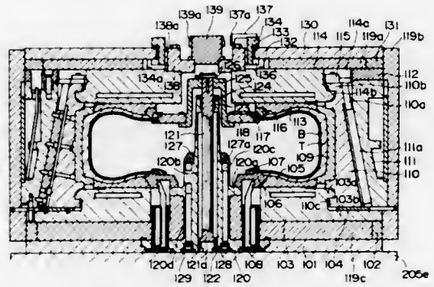
Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1995, Ser. No. 446,571

Claims priority, application Japan, Jun. 3, 1994, 6-122661; Apr. 10, 1995, 7-084109

Int. Cl.[6] **B29D** *30/06;* **B29C** *33/24*

U.S. Cl. 425—46 **1 Claim**



1. A split mold apparatus for a tire vulcanizer, having an upper disk to which an upper sidewall mold portion for molding one side of a tire is assembled, a lower disk to which a lower sidewall mold portion for molding the other side of the tire is assembled, a split segment to which a tread mold portion divided into plural pieces in the circumferential direction for molding a tire tread portion is assembled, and an outer ring having an inside inclined surface corresponding to an outside inclined surface of said segment and fitted so as to be capable of relative sliding concentrically with said segment with both said inclined surfaces being used as a sliding surface, wherein claws fitted to said upper and lower disks to prevent the separation of said upper and lower disks when the split mold apparatus is closed are provided at upper and lower parts of said segment, a cover plate whose outer periphery is fixed to said outer ring is provided above said upper disk, and a locking means for locking said upper disk and said cover plate when the split mold apparatus is closed is provided between said cover plate and said upper disk wherein:

said cover plate is elastically deformed to the side of said upper disk, and said locking means is operable so as to establish a locking condition wherein most of the elastic deformation is left when an inside claw of an outer locking means ring rotatably mounted to an inner peripheral portion of said cover plate is engaged with an outside claw of an inner locking means ring fixed to an inner peripheral portion of said upper disk.

5,589,201

APPARATUS FOR GAUGE DISTRIBUTION IN A TUBULAR PLASTIC FILM

Peter V. Tkach, and Frank G. Oplt, both of Mississauga, Canada, assignors to Macro Engineering & Technology Inc., Mississauga, Canada

Filed May 5, 1995, Ser. No. 437,075

Int. Cl.[6] **B29C** *53/20*

U.S. Cl. 425—66 **12 Claims**

1. Apparatus for effecting gauge distribution in flattened tubular plastic film, said apparatus comprising:

collapsing means for collapsing upwardly vertically moving expanded tubular plastic film to a two layer flattened condition, said collapsing means being located above the upwardly moving expanded tubular plastic film and aligned with the longitudinal central axis thereof, said collapsing means being rotatable about said central axis,

a first motor for rotating the collapsing means about said central axis through 180° in each direction from a neutral position,

a first horizontal film direction reverser secured to the collapsing means for rotation therewith and laterally spaced from said central axis for reversing the direction of travel of said flattened film leaving the collapsing means from a radially outward direction away from said central axis to a radially inward direction toward said central axis,

a first horizontal turning bar located above the collapsing means and extending substantially through said central axis for receiving said flattened film from the first direction reverser, said flattened film passing around the first turning bar and leaving said first turning bar in a radially outward direction,

a first turning bar carrier carrying the first turning bar and rotatable about said central axis to rotate the first turning bar horizontally, and

a second horizontal film direction reverser laterally spaced from said central axis for reversing the direction of travel of the flattened film leaving the first turning bar from a radially outward direction to a radially inward direction towards the central axis,

a direction reverser carrier rotatable about said central axis and carrying the second film direction reverser for rotation therewith,

a second horizontal turning bar located about the first turning bar and extending substantially through said central axis for receiving said flattened film from the second film direction reverser, said flattened film passing around the second turning bar and leaving said second turning bar in a radially outward direction,

a second turning bar carrier carrying a second turning bar and rotatable about said central axis to rotate the second turning bar horizontally,

second motor means for simultaneously rotating the first turning bar carrier to rotate the first turning bar about said central axis through 135° in each direction from a neutral position, rotating the second film direction reverser about said central axis through 90° in each direction from the neutral position and rotating the second turning bar carrier to rotate the second turning bar about said central axis through 45° in each direction from the neutral position simultaneously with said rotation of the collapsing means and first direction reverser by said first motor, and thereby distribute gauge variations in the two layer flattened film leaving the collapsing means across the width of the flattened film.

5,589,202

APPARATUS FOR MOLDING POLYURETHANE FOAM

Hidenobu Okano, and Katsunori Watanabe, both of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Division of Ser. No. 59,739, May 12, 1993, abandoned, which is a continuation of Ser. No. 712,716, Jun. 10, 1991, abandoned. This application Jun. 29, 1994, Ser. No. 267,398

Claims priority, application Japan, Jun. 12, 1990, 2-153439; Apr. 12, 1991, 3-108745

Int. Cl.[6] **B28B** *1/50*

U.S. Cl. 425—73 **6 Claims**

1. An apparatus for molding a polyurethane foam which covers a ring of a steering wheel, comprising:

a mold made up of at least two mold parts which are opened and closed;

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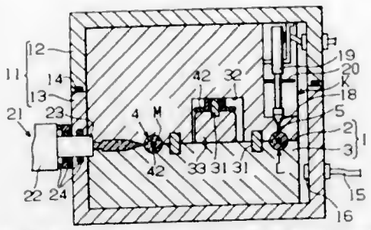


said mold defining a ring-shaped cavity when said mold parts are closed;

means defining a gate connected to said cavity;

a mechanism for injecting a polyurethane material into said cavity through said gate, polyurethane materials injected through said gate flowing in two directions through the ring-shaped cavity towards a final fill position in the mold;

means defining a vent hole at the final fill position in the mold where said polyurethane materials flowing in said two directions meet;

mating mold surfaces of said mold parts defining an air vent around substantially an entire periphery of said cavity when said mold parts are closed, whereby air is vented through said air vent as said polyurethane material flows through the ring-shaped cavity towards the final fill position;

a vacuum box surrounding said mold;

a space defined between said mold and said vacuum box, having a volume greater than said cavity, and in communication with said cavity both via said vent hole and via said air vent when said split molds are closed; and

a depressurizing means operatively connected to said space.

5,589,203

VACUUM KNEADING AND EXTRUDING APPARATUS

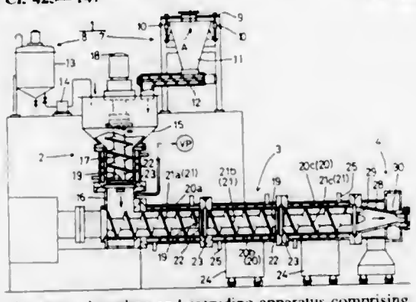
Takuya Sato, Suita, Japan, assignor to Sato Iron Works Co., Ltd., Osaka, Japan

Continuation of Ser. No. 189,476, Jan. 31, 1994, abandoned. This application Jul. 13, 1995, Ser. No. 502,101

Claims priority, application Japan, Nov. 10, 1993, 5-280777

Int. Cl.[6] B29C *47/92;47/38*

U.S. Cl. 425—147 **10 Claims**



1. A vacuum kneading and extruding apparatus comprising

measuring devices for separately and continuously measuring and outputting plural types of material,

means for continuously transporting said material downstream from the measuring devices,

a kneading and degassing tank comprising a receiving hopper which receives material from said transport means, a kneading screw in said receiving hopper, and a vacuum chamber downstream of said receiving hopper, said kneading screw being rotatable about a vertical axis,

a first kneading mechanism disposed between said kneading screw and said vacuum chamber, said first kneading mechanism comprising a rotatable disk fixed to said kneading screw and a fixed disk fixed to said receiving hopper;

means for controlling the level of material in said receiving hopper so that the level of material in said receiving hopper constantly lies in a predetermined range,

a transport tube having therein a transport screw for transporting said material downstream from said vacuum chamber; and

forming means downstream of said transport tube for forming and extruding the material.

5,589,204

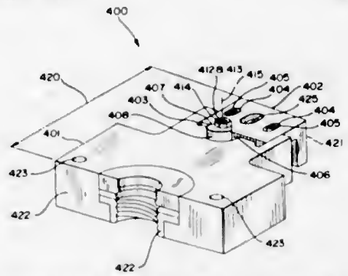
BOTTLE MOLD WITH ADJUSTABLE NECK BLOCK

Emanuel E. Wohlgemuth, 1381 Pea Pond Rd., North Bellmore, N.Y. 11710

Filed May 16, 1995, Ser. No. 491,552

Int. Cl.[6] B29C *49/76*

U.S. Cl. 425—182 **8 Claims**



1. A neck-finish top block for use in a container blow mold system and comprising:

a base having a parting face and a heel mounting surface perpendicular thereto,

a heel engaging said heel mounting surface and adapted for longitudinal translation relative to said base and normal to said parting face and including a tail surface transverse to and parallel to said parting face and separated therefrom by a certain longitudinal distance,

a cam engaging one of said base or said heel and rotatable about an axis fixed thereto, and having a displacement surface engaging the other of said base or said heel at a contact point, and adapted such that rotation of said cam causes longitudinal displacement of said contact point, and

wherein said contact point displacement facilitates longitudinal translation of said heel and thereby facilitates variation of said certain longitudinal distance.

5,589,205

APPARATUS FOR MANUFACTURING HOLLOW RESIN PRODUCTS

Hajime Ishikawa, Toyonaka; Masaaki Ogawa, Kobe; Ryosuke Hasegawa, Kobe, and Hideo Yamamoto, Kobe, all of Japan, assignors to Tigers Polymer Corporation, Toyonaka, Japan

Filed Oct. 25, 1994, Ser. No. 329,648

Claims priority, application Japan, Oct. 26, 1993, 5-266811; Sep. 29, 1994, 6-234958

Int. Cl.[6] B29C *49/64*

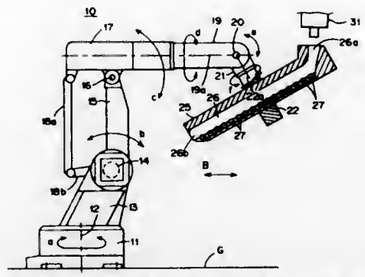
U.S. Cl. 425—526 **9 Claims**

1. An apparatus for manufacturing hollow resin products, the apparatus comprising:

an extruder for extruding a tubular resin material and cutting the material into a parison with a specified length;

a blow molding machine having an upper mold and a lower mold which form a cavity of a specified shape inside; and

a parison delivering machine for receiving the parison from the extruder and feeding the parison into the cavity of the lower mold, the parison delivering machine comprising a conveyer which has a parison feeder for feeding a parison longitudinally from an inlet to an outlet, driver for driving the feeder



and at least four shafts which serve as pivots of three-dimensional movement of the conveyor wherein the parison delivering machine comprises six shafts, in which:

a first shaft is positioned vertically to a floor and serves as a pivot of a movement of the conveyer in parallel to the floor;

a second shaft is positioned on the first shaft and serves as a pivot of a forward/backward movement of the conveyer;

a third shaft is positioned on the second shaft and serves as a pivot of an upward/downward movement of the conveyer;

a fourth shaft is positioned on the third shaft and serves as a pivot of a swing of the conveyer in a plane perpendicular to a parison feeding direction;

a fifth shaft is positioned on the fourth shaft and serves as a pivot of a swing of the conveyer in a plane including the parison feeding direction; and

a sixth shaft is positioned on the fifth shaft and serves as a pivot of a rotation in substantially a horizontal plane on a central portion of the conveyer in the longitudinal dimension.

5,589,206

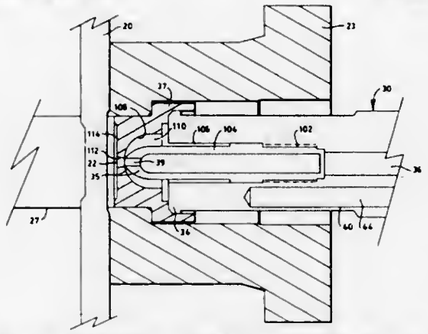
COMPACT DISC INJECTION MOLDING APPARATUS

Douglas C. Hepler, Rochester, N.Y., assignor to Polyshot Corporation, Henrietta, N.Y.

Filed Jul. 22, 1994, Ser. No. 278,935

Int. Cl.[6] B29C *45/20*

U.S. Cl. 425—549 **11 Claims**



1. An injection molding system for fabricating thin, flat compact discs, said injection molding system comprising:

a pair of molding plates relatively moveable with respect to one another, one of said pair of molding plates being stationary and one moveable with respect to said stationary one;

a pair of molding blocks carried on said pair of said molding plates, at least one of said pair of said molding blocks being adapted to form a molding cavity for the compact discs, said pair of said molding plates and said pair of said molding blocks adapted to be moved between a closed position in which said molding cavity is closed for forming the compact discs and an open position in which the compact discs may be removed from said molding cavity, one of said molding blocks being carried on said moveable molding plate and one being fixedly mounted to said stationary molding plate;

a heatable sprue bushing for use in transporting plasticized material from an injection nozzle to the edge of the mold cavity while controlling the temperature of the plasticized material, said heatable sprue bushing comprising:

an elongated body of given length having arranged in order along its length a head, a stem, and a distal end, said head having a reference seating surface which faces said distal end and a rear surface facing opposite said distal end, said elongated body having a through bore passing from end to end through said head, stem, and distal end thereof for transporting plasticized material through at least a portion of said elongated body from said head toward said distal end thereof, said elongated body having at least one non-through bore extending alongside said through bore, in heat conducting relationship with respect thereto, and adapted to receive an electrically powered heating cartridge for controlling the temperature of plasticized material as it travels along said through bore, said nonthrough bore having a length which extends from said head rear surface, through said head and said stem and into said distal end by a predetermined distance, said length of said nonthrough bore being shorter than said given length of said elongated body, said through bore being counter bored a given depth near said distal end of said elongated body, said body being fabricated of a material with a predetermined heat capacity and coefficient of thermal conductivity to provide it with a predetermined mass and heat transfer capability, a predetermined length of said elongated body extending through said stationary molding plate and said block fixedly attached thereto; and

a tip fitted into said counterbore of said elongated body so that part of said tip is in heat conducting relationship with respect to said elongated body while its remaining parts are thermally isolated therefrom, said tip being releasably mateable with said elongated body, having a single flow bore which is adapted to communicate with said through bore of said elongated body to receive plasticized material from it, and a curved forward end, said tip including a single flow channel of predetermined length that communicates with the gate of the cavity mold, said tip being fabricated of a material that has a thermal mass less than that of said body material and a coefficient of thermal conductivity substantially higher than that of said elongated body material so that said elongated body acts as a constant temperature source with respect to said tip so as to transfer heat to said tip at said portion thereof in thermal contact therewith to heat said tip, said predetermined length of said flow channel of said tip, said curved forward end of said tip, and said molding blocks being configured and arranged with respect to one another so that the temperature of said curved forward end of said tip gradually reduces to a level at which plasticized material just freezes at the gate to mold cavity at the end of a molding cycle before the beginning of a subsequent molding cycle.

5,589,207

METHOD OF PRODUCING A FROZEN YEAST DOUGH PRODUCT

Peter Larsen, deceased, late of Nice, France, and Henrik S. Pedersen, executor, Birkerod, Denmark, assignors to Kval Marketing Inc., Petaluma, Calif.

Continuation of Ser. No. 268,069, Jun. 28, 1994, abandoned, which is a continuation of Ser. No. 777,525, Sep. 15, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,813

Claims priority, application Denmark, Jul. 14, 1989, 3489/89

Int. Cl.[6] A21D *8/04*

U.S. Cl. 426—20 **28 Claims**

1. A method of producing a frozen, leavened laminated dough which is suitable for immediate baking when taken from the freezer comprising the steps of forming a dough essentially free of

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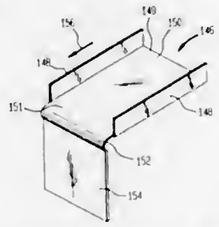
fermentable mono and disaccharides by mixing baking dough forming ingredients, other than fermentable mono and disaccharides, including flour, fat, water, yeast and amylase, said amylase including an amylase component which remains active at temperatures above 60 degrees Centigrade, to form a baking dough to which fermentable mono and disaccharides have not been added, folding and rolling said dough to effect lamination thereof, leavening said dough and freezing the leavened dough, said amylase being added in an amount to generate sufficient fermentable saccharides under leavening conditions for yeast leavening of the dough and said component thereof which remains active above 60 degrees Centigrade being added in an amount sufficient to increase browning of the dough during baking thereof.

5,589,208

METHODS FOR COATING EGG YOLKS AND OTHER ARTICLES

Eustathios Vassiliou, 12 S. Townview La., Newark, Del. 19711

Filed Mar. 14, 1995, Ser. No. 403,424
Int. Cl.[6] A23L *1/32;* **B01D** *43/00*
U.S. Cl. 426—89 **16 Claims**



1. A method of encapsulating a yolk disk with a restrictive barrier comprising the steps of:

(a) contacting the yolk with an excess of a first liquid containing a first reactant for the yolk to be wetted with said first reactant, the first reactant comprising a cross-linker;

(b) separating the yolk from the excess of the first liquid;

(c) subsequently treating the wetted yolk with an excess of a second liquid containing a second reactant, which second reactant reacts with the first reactant to form the restrictive barrier, the second liquid comprising a cross-linkable polymer; and

(d) separating the treated yolk from the second liquid;

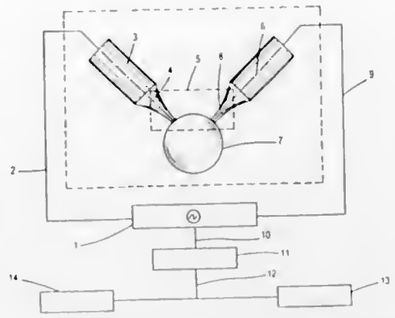
with the requirement that the separating steps (b) and (d) are performed in the absence of mechanically moving parts.

5,589,209

METHOD FOR A NON-DESTRUCTIVE DETERMINATION OF QUALITY PARAMETERS IN FRESH PRODUCE

Amos Mizrach, Rishon-Le-Zion; Naftali Galili, Afula, and Giora Rosenhouse, Haifa, all of Israel, assignors to State of Israel, Ministry of Agriculture, Bat Dagan, Israel

Filed Apr. 24, 1995, Ser. No. 427,219
Claims priority, application Israel, Apr. 24, 1994, 109406
Int. Cl.[6] G05B *1/00*
U.S. Cl. 426—231 **17 Claims**



1. A method of determining quality parameter of fresh produce using ultrasonic sound waves, which comprises:

arranging a sample of fresh produce of an unknown maturity stage in an ultrasonic sound path;

transmitting ultrasonic sound waves along the sound path through the sample of the fresh produce;

detecting and receiving said sound waves after said sound waves pass through the fresh produce sample; and

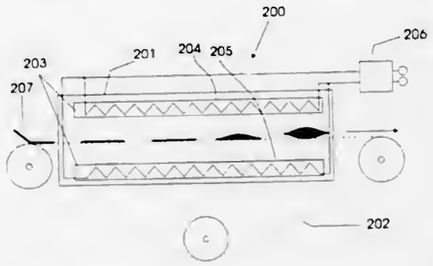
calculating values of acoustical parameters, including at least wave velocity and signal attenuation of the detected sound waves, to analyze said values which are indicative of quality of the fresh produce sample.

5,589,210

METHOD FOR COOKING WHEAT FLOUR PRODUCTS BY USING INFRARED RADIATION

Jose De La Luz Martinez, Puebla; Jesus Gonzalez-Hernandez, Tesoro; Feliciano Sanchez-Sinencio, Tecamachalco; Maximiano Ruiz-Torres, Morelia; Juan De Dios Figueroa C., Tamaulipas, and Fernando Martinez-Bustos, Veracruz, all of Mexico, assignors to Centro de Investigacion Y de Estudios-Avanzados del I.P.N., Mexico City, Mexico

Filed Aug. 23, 1995, Ser. No. 519,060
Int. Cl.[6] A23L *1/00*
U.S. Cl. 426—243 **10 Claims**



1. A method of cooking wheat flour tortillas comprising:

a) preparing a wheat flour based dough;

b) cutting and shaping the dough into circular flat pieces of predetermined diameter and thickness to form uncooked wheat flour tortillas;

c) generating infrared radiation waves to be irradiated within a cooking space for the wheat flour tortillas;

d) selecting an optimal wavelength band of said infrared radiation waves in which the absorption factor is independent from temperature and which will produce a maximum absorption of infrared radiation by the wheat flour tortillas to quickly evaporate water from the outermost surfaces thereof in order to form capping layers which will retain moisture within the inner portion of the tortillas; and

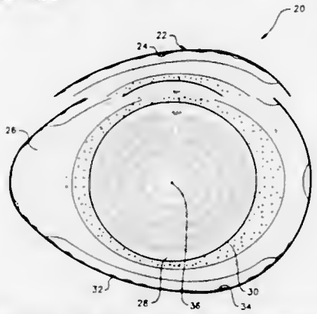
e) passing the uncooked wheat flour tortillas through said cooking space at a predetermined speed in order to produce the desired degree of cooking of the tortillas.

5,589,211

METHODS FOR PROCESSING POULTRY SHELL EGGS

James P. Cox; R. W. Duffy Cox, and Jeanne M. Cox, all of 246 E. Bartlett Rd., Lynden, Wash. 98264

Continuation-in-part of Ser. No. 746,940, Aug. 19, 1991, which is a continuation-in-part of Ser. No. 674,495, Mar. 25, 1991, Pat. No. 5,283,072, which is a continuation of Ser. No. 349,974, May 8, 1989, abandoned, which is a continuation of Ser. No. 196,878, May 19, 1988, abandoned, which is a continuation of Ser. No. 70,597, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 758,086, Jul. 23, 1985, abandoned.
This application Nov. 22, 1993, Ser. No. 156,273
The portion of the term of this patent subsequent to Aug. 19, 2011, has been disclaimed.
Int. Cl.[6] A23B *5/005*
U.S. Cl. 426—298 **3 Claims**



1. A method of making a poultry shell egg safer to eat, said method comprising the steps of:

promoting the transfer of heat to the egg by first heating said egg at a temperature above that at which the white of the egg will coagulate but not higher than about 170° F. but for a sufficiently short period of time to preclude significant coagulation of said white; and then

heating said egg at a second, lower, pasteurization temperature in the range of 130° F. to <140° F. and below the coagulation temperature of the egg white for a time sufficient to destroy infectious microorganisms throughout the mass of the egg.

5,589,212

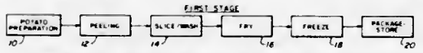
Patent Not Issued For This Number

5,589,213

DUAL-STAGE PROCESS FOR MANUFACTURING POTATO CHIPS

Pravin M. Desai, Carrollton; Michael L. Pfeiffer; Mary M. Pohlmeier, both of Dallas, and Jennifer B. Raymond, Plano, all of Tex., assignors to Recot, Inc., Pleasanton, Calif.

Filed Apr. 7, 1995, Ser. No. 418,306
Int. Cl.[6] A23L *1/217*
U.S. Cl. 426—438 **30 Claims**



1. A dual-stage process for preparing potato chips consisting essentially of the steps of:

a first stage continuous process for preparing potato slices at a first location for indefinite storage comprising the steps of:

slicing peeled potatoes to a thickness in the range of about 1.3 mm to about 2.8 mm;

washing said potato slices to remove surface starch thereon;

frying said washed potato slices for a time period sufficient to reduce the moisture content of the potato slices to about 3% to 30%; freezing said potato slices; and

storing said frozen potato slices at a temperature of −18° C. (0° F.) for an extended period of time; and

a second stage continuous process for preparing potato chips for consumer use comprising the steps of:

shipping said frozen potato slices to a plurality of second locations;

frying said frozen potato slices at each one of the plurality of second locations for a time period sufficient to form potato chips; and

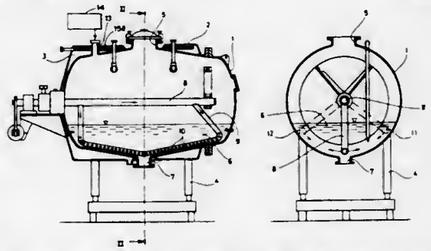
bagging said potato chips for consumer use.

5,589,214

PROCESS FOR HEAT TREATMENT OF PARTICULATE MATERIALS SUCH AS FOOD

Bengt Palm, Genarp, Sweden, assignor to Alfa-Laval Food Engineering AB, Stockholm, Sweden

Division of Ser. No. 720,834, Jul. 12, 1991, Pat. No. 5,284,085.
This application Nov. 8, 1993, Ser. No. 148,352
Claims priority, application Sweden, Jan. 27, 1989, 8900297; WIPO, Jan. 25, 1990, PCT/SE90/08482
Int. Cl.[6] A23L *3/16*
U.S. Cl. 426—506 **3 Claims**



1. A process for the treatment of particulate materials in a treatment vessel having an inlet for material to be treated and an outlet for treated material, to evacuate and pressurize the vessel, said vessel further having a horizontal treatment chamber and a hollow oscillating agitation device having a plurality of perforations, said process comprising directing material to be treated into the vessel such that said particulate material fills only a lower part of said vessel in the form of a layer, stirring said material by oscillating said agitation device, subjecting said vessel to vacuum, heating said material by injecting steam into said material while stirring said material, flash cooling said material by spraying the outside of said vessel with a cooling liquid, pressurizing said vessel with gaseous nitrogen, and removing the treated material from the vessel wherein said steam is injected into said material through the perforations of said agitating device and said oscillating movement is effected in such manner that the agitating device is moved through said particulate material to a turning point just below the surface of said layer and then changes direction and moves through said layer past a vertical position to a second turning point just under the surface of the layer on an opposing side of said vessel in such manner as to impart even heat treatment to all of said particulate material.

5,589,215

METHOD OF MAKING AND USING A FAT MIMETIC IN REDUCED FAT/CHOLESTEROL FOODSTUFFS

Pamela S. Tang, Palatine, Ill., assignor to Griffith Laboratories Worldwide, Inc., Alsip, Ill.

Filed Sep. 29, 1993, Ser. No. 128,602
Int. Cl.[6] A21D *2/00;* **A23L** *1/0522*
U.S. Cl. 426—549 **23 Claims**

1. A fat-free composition for use as a mimetic said composition consisting essentially of:

about 10–85 percent by weight starch;

about 2–25 percent by weight cellulose;

about 4–70 percent by weight protein;

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about 0–4 percent by weight gum; and
about 0–8.2 percent by weight flavoring.

5,589,216

REDUCED CALORIE CONFECTIONERY COMPOSITIONS WHICH CONTAIN REDUCED CALORIE FATS WHICH EXHIBIT RAPID TRANSFORMATION TO BETA PHASE

Gerald J. Guskey, Montgomery; James A. Hellyer, Milford; Bernard W. Kluesener, Harrison, and Gordon K. Stipp, Cincinnati, all of Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio

Filed Nov. 8, 1994, Ser. No. 336,157
Int. Cl.[6] A23G *1/00*
U.S. Cl. 426—607 **18 Claims**

1. A process for preparing a bloom-stable, flavored confectionery composition which contains reduced calorie fat in the stable beta phase, which process comprises:

(I) forming a temperable, flavored confectionery composition which comprises:

A) a flavor enhancing amount of a flavor component;

B) from about 15% to about 45% of a fat component comprising:

(i) at least about 70% by weight of the fat component of a reduced calorie cocoa butter substitute fat having:

(a) at least about 40% by weight of the reduced calorie fat MLM triglycerides;

(b) at least about 85% by weight of the reduced calorie fat combined MLM and MML triglycerides;

(c) no more than about 5% by weight of the reduced calorie fat combined LLM and LML triglycerides;

(d) no more than about 4% by weight of the reduced calorie fat of MMM triglycerides;

(e) no more than about 2% by weight LLL triglycerides; and

(f) no more than about 6% by weight of other triglycerides;

wherein in said triglycerides M is a C_6 to C_{10} saturated fatty acid residue and L is a C_{17} to C_{26} saturated fatty acid residue; and wherein said triglycerides are further characterized by having a fatty acid composition which comprises

(x) from about 35% to about 60% combined C_8 and C_{10} saturated fatty acids,

(y) a ratio of C_8 to C_{10} saturated fatty acids of from about 1:5 to about 25:1,

(z) from about 35% to about 60% behenic fatty acid;

(ii) up to about 20% by weight of the fat component of milkfat;

(iii) up to about 20% by weight of the fat component of cocoa butter; and

(iv) no more than about 4% by weight of the fat component of diglycerides; and

C) from about 55% to about 85% other nonfat confectionery ingredients;

(II) dynamically tempering the flavored confectionery composition of Step (I) by cooling said composition from a noncrystalline state to a temperature of less than about 21.1° C. at a rate of from about 0.4° C./min. to about 83° C./min. while simultaneously working said composition to impart shear agitation thereto to the extent of shear rates ranging from about 400 to about 8000 sec-1, and by thereafter conditioning said composition for at least about 2 minutes by agitating and warming said composition to a temperature of from about 21.1° C. to about 29.4° C.; and thereafter

(III) setting the tempered composition by cooling and/or warming the tempered composition from Step (II) in a manner such that the reduced calorie fat transforms into a stable beta crystalline phase.

5,589,217

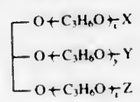
REDUCED CALORIE FAT COMPONENT

Harry Mazurek, Bala Cynwyd, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed May 11, 1995, Ser. No. 439,167
Int. Cl.[6] A23D *9/02*
U.S. Cl. 426—611 **10 Claims**

1. A reduced calorie fat component comprised of

(a) a digestion resistant esterified propoxylated glycerin having a dilatometric solid fat index of at least 50° at 21° C. and at least 10° at 37° C. and structure



wherein x, y, and z are each at least 1, the sum of x+y+z is from 3 to 21, and X, Y, and Z are the same or different and are selected from the group consisting of H and

$$-\overset{O}{\overset{\|}{C}}R,$$

wherein R is a C_4–C_{23} aliphatic group and at least two of X, Y, or Z are

$$-\overset{O}{\overset{\|}{C}}R;$$

and

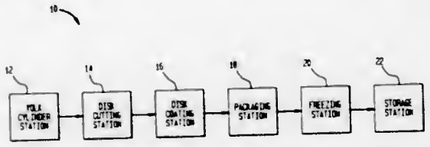
(b) a triacylglycerol bearing both at least one C_2–C_4 carboxylic acid residue and at least one C_{16}–C_{24} saturated fatty acid residue and having a dilatometric solid fat index of less than 50° at 21° C. and less than 10° at 37° C.; wherein the triacylglycerol is present in the reduced calorie fat component in an amount effective to provide a dilatometric solid fat index of less 50° at 21° C. and less than 10° at 37° C.

5,589,218

METHOD FOR MAKING ARTIFICIAL EGG YOLKS IN THE FORM OF A CYLINDER

Eustathios Vassiliou, 12 S. Townview La., Newark, Del. 19711

Filed Mar. 14, 1995, Ser. No. 403,653
Int. Cl.[6] A23L *1/32*
U.S. Cl. 426—614 **6 Claims**



1. A method of making artificial egg-yolk comprising the steps of:

(a) mixing artificial egg-yolk materials including a positive thermoreversible gel former to form a first mixture, the positive thermoreversible gel former providing a gel temperature to the artificial egg-yolk;

(b) heating the first mixture to a first temperature in the range of 150°–190° F.;

(c) mixing a quantity of the first mixture, while said first mixture is still at a temperature in the range of 150°–190° F., with a quantity of a liquid having a second temperature, in the range of 32°–60° F., and comprising egg-white to form a second mixture having a third temperature in the range of 100°–130° F. the quantities of the first mixture and the liquid, and the first and second temperatures being such that the third temperature is higher than the gel temperature but lower than a temperature at which the egg-white coagulates;

(d) cooling the second mixture below the gel temperature to form a gel; and

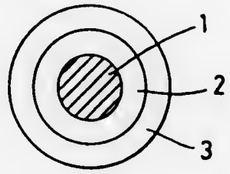
(e) extruding the second mixture through a die to form a gelled artificial yolk having a shape of a cylinder.

5,589,219

HEAT-RESISTANT, HIGH-VOLTAGE LEAD WIRE FOR DIRECT CURRENT

Hiroshi Hayami, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 281,531, Jul. 28, 1994, Pat. No. 5,470,657, which is a continuation of Ser. No. 930,597, Oct. 2, 1992, abandoned. This application May 3, 1995, Ser. No. 433,061
Claims priority, application Japan, Apr. 26, 1991, 3-125376
Int. Cl.[6] B05D *5/12;3/02;* **C08J** *7/04*
U.S. Cl. 427—117 **4 Claims**



1. A method for producing heat-resistant, high-voltage lead wires for direct current comprising:

forming an insulating layer over a high-voltage lead wire for direct current, wherein said insulating layer comprises a polyolefin based resin composition, said polyolefin resin composition being a resin composition made by adding more than 1 part by weight and less than 10 parts by weight of an organic silane compound during the mixing of more than 100 parts by weight and less than 200 parts by weight of a metal hydroxide and more than 5 parts by weight and less than 50 parts by weight of a halogen containing flame retardant to 100 parts by weight of a polyolefin resin, said organic silane compound having the formula:

where, R stands for an alkyl group containing an acryl or methacryl group, and X^1, X^2 and X^3 represent a member selected from the group consisting of alkoxy, alkyl and halogen.

and irradiating said insulating layer with ionizing radiation.

5,589,220

METHOD OF DEPOSITING CHROMIUM AND SILICON ON A METAL TO FORM A DIFFUSION COATING

Robert A. Rapp; Ge Wang, both of Columbus, Ohio, and Endang Pangestuti, Palembang, Indonesia, assignors to The Ohio State University Research Foundation, Columbus, Ohio

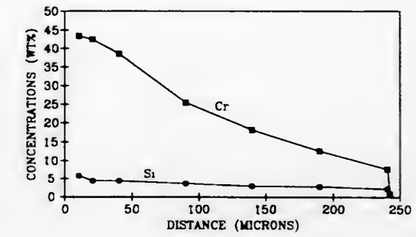
Continuation of Ser. No. 240,350, May 10, 1994, Pat. No. 5,492,727. This application Oct. 30, 1995, Ser. No. 550,108
Int. Cl.[6] B05D *5/12*
U.S. Cl. 427—126.1 **9 Claims**

1. A method for forming a diffusion coating by depositing chromium and silicon on an iron-based substrate comprising the steps of:

(a) placing a cementation pack in surrounding relationship to a surface of the substrate, the cementation pack including a mixture of essentially pure chromium powder and essentially pure silicon powder, at least one halide salt activator, and an alumina filler;

(b) heating the substrate and cementation pack in an inert or reducing atmosphere to a first temperature sufficient to cause vaporization of the halide salt and for a time sufficient to cause the preferential deposition of essentially silicon on the surface of the substrate; and then

(c) heating the substrate and cementation pack to a second, higher temperature for a time sufficient to cause the deposition of predominantly chromium on the surface of the substrate.

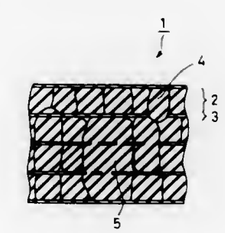


5,589,221

MAGNETIC THIN FILM, AND METHOD OF MANUFACTURING THE SAME, AND MAGNETIC HEAD

Masayoshi Hiramoto, Ikoma; Osamu Inoue; Koichi Kugimiya, both of Osaka, and Kenji Iijima, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1995, Ser. No. 439,574
Claims priority, application Japan, May 30, 1994, 6-116454; May 16, 1994, 6-100939; Dec. 7, 1994, 6-303614
Int. Cl.[6] G11B *5/85*
U.S. Cl. 427—130 **7 Claims**



1. A method of manufacturing a magnetic thin film, comprising the steps of:

forming at least one layer of a main magnetic precursor layer containing at least one element having lower oxide or nitride formation free energy than Fe and at least one element selected from the group consisting of Fe, Co, and Ni on at least one layer of an intermediate precursor layer on the surface of a substrate;

conducting a heat treatment thereto at a temperature of from 400° to 700° C.; and

laminating a main magnetic layer comprising magnetic crystal grains substantially having a columnar structure which have an average height dl and an average diameter ds forming a shape ratio of $0.3 \leqq ds/dl \leqq 0.9$ on an intermediate layer having saturation magnetic flux density of at least 0.1 tesla less than said main magnetic layer.

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5,589,222

HYDROPHOBIC FREE-FLOWING PELLETS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Peter Thometzek, Krefeld, Germany, and Heinrich Christ, Spilamberto, Italy, assignors to Ferro (Italia) S.r.l., Bologna, Italy

Continuation of Ser. No. 510,331, Aug. 2, 1995, abandoned, which is a continuation of Ser. No. 72,105, Jun. 7, 1993, abandoned. This application Feb. 1, 1996, Ser. No. 595,514

Claims priority, application Italy, Jun. 18, 1992, MI92A1507

Int. Cl.[6] B05D *7/00*

U.S. Cl. 427—215 **7 Claims**

1. A process for the production of hydrophobic, free-flowing pellets having an average particle size of 5 to 150 μm comprising the steps of:

(i) providing a first hydrophilic inorganic powder and a second hydrophilic inorganic powder which is separate and distinct from said first inorganic powder;

(ii) providing an aqueous emulsion comprising one or more hydrophobic polyorganosiloxanes;

(iii) adding together in a granulator said first and said second inorganic powders and said aqueous emulsion to provide a mixture, said mixture comprising from about 0.05 to 15% by weight said hydrophobic polyorganosiloxane and processing said mixture in said granulator; and

(iv) heating said mixture subsequent to said step (iii) for up to 24 hours at a temperature of from 120° to 600° C. to provide said free-flowing pellets.

5,589,223

PROCESS FOR PRODUCING CEMENT CUTTING TOOLS HAVING BOTH LONGITUDINAL AND GRANULAR CRYSTAL STRUCTURES

Niro Odani; Hironori Yoshimura; Akira Osada; Tetsuya Tanaka, and Seiichirou Nakamura, all of Ibaraki-ken, Japan, assignors to Mitsubishi Material Corp., Tokyo, Japan

Division of Ser. No. 73,328, Jun. 8, 1993, Pat. No. 5,436,071, which is a continuation-in-part of Ser. No. 644,446, Jan. 23, 1991, abandoned. This application Mar. 21, 1995, Ser. No. 408,691

Claims priority, application Japan, Jan. 31, 1990, 2-21048; Jan. 31, 1990, 2-21048; Aug. 4, 1992, 4-227874; Aug. 11, 1992, 4-235265; Aug. 11, 1992, 4-235266; Aug. 11, 1992, 4-235267

Int. Cl.[6] C23C *16/30*

U.S. Cl. 427—248.1 **4 Claims**

1. A process for producing a cermet cutting tool comprising the steps of:

a) preparing a substrate, having a surface, from titanium carbonitride based cermet;

b) forming a coating layer onto the surface of said substrate using a first chemical vapor deposition and a second chemical vapor deposition;

c) wherein said first chemical vapor deposition is performed using a reaction gas comprised of 1–5% of $TiCl_4$, 0.1–1% of CH_3CN, and 0–25% of N_2, with the remaining portion being H_2, at a reaction temperature of 800°–900° C. and a reaction pressure of 30–200 Torr, so as to form at least one titanium carbo-nitride layer having a longitudinal growth crystal structure in which crystal grains are elongated along a direction perpendicular to the surface of said substrate;

d) said second chemical vapor deposition is performed at a reaction temperature of 950°–1050° C. so as to form at least one granular crystal layer having a granular crystal structure, each said granular crystal layer being formed from a compound selected from the group consisting of titanium carbide (TiC), titanium nitride (TiN), titanium carbo-oxy-nitride (TiCNO), and aluminum oxide (Al_2O_3); and

e) said coating layer is formed by said first chemical vapor deposition and said second chemical vapor deposition to comprise at least one of the following crystal structures:

i) a crystal structure which changes from said granular crystal structure to said longitudinal growth crystal structure in going from said substrate to the surface of said coating layer;

ii) a crystal structure which changes from said granular crystal structure to said longitudinal growth crystal structure and back to said granular crystal structure in going from said substrate to the surface of said coating layer; and

iii) a crystal structure which changes from said longitudinal growth crystal structure to said granular crystal structure in going from said substrate to the surface of said coating layer.

5,589,224

APPARATUS FOR FULL WAFER DEPOSITION

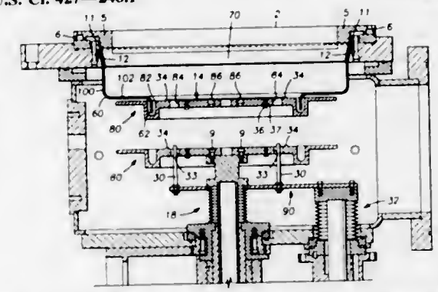
Avi Tepman, Cupertino, Calif.; Takeshi Jinbo, Ichihara, Japan; Hiroyuki Takahama, Sawara, Japan, and Akihiko Saito, Chiba, Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 954,850, Sep. 30, 1992. This application Sep. 22, 1994, Ser. No. 310,617

Claims priority, application Japan, Sep. 30, 1993, 5-245469

Int. Cl.[6] C23C *16/00*

U.S. Cl. 427—248.1 **13 Claims**



1. A deposition shield arrangement for limiting the deposition of deposition materials on internal chamber components during the processing of a substrate in the deposition chamber, comprising:

a substrate support member disposed in the chamber and selectively positionable in the chamber to receive a substrate thereon;

a shield member extending circumferentially around the substrate support member and cooperating with said substrate support member to prevent deposition on the deposition chamber interior surfaces shielded by said shield member and said substrate support member during the processing of a substrate in the chamber;

said support member including a circumferential groove extending inwardly of the substrate receiving portion thereof; and

said shield member including a circumferential, downwardly extending portion received in said groove when said support member is positioned for the processing of a substrate in the chamber.

10. A method of shielding the interior surfaces of a processing chamber from a deposition environment maintained within the chamber, comprising the steps of:

providing a moveable substrate support member, having a substrate receiving surface and an extending portion extending outwardly from said substrate receiving surface, in the chamber;

providing a shield member extending inwardly of the chamber and spaced from the chamber walls said support member and said shield cooperating to shield portions of the chamber from the deposition environment maintained in the chamber;

providing a groove in the extending portion of the support member; and

extending a portion of the shield member into the groove.

5,589,225

GRANULATING-COATING APPARATUS AND GRANULATING AND COATING METHOD USING THE SAME

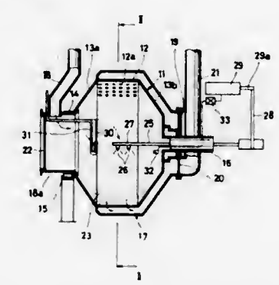
Shuri Yamada, Hosoe-cho; Masanori Ogawa, Hamakita, and Kazuomi Unosawa, Hamamatsu, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1995, Ser. No. 397,568

Claims priority, application Japan, Mar. 11, 1994, 6-040860

Int. Cl.[6] B05D *7/00*

U.S. Cl. 427—212 **32 Claims**



14. A method of granulating and coating, wherein articles to be processed are granulated or coated by use of a granulating coating apparatus comprising a processing container, in which articles to be processed are contained, said processing container comprising a fluidized bed container, in which gas is introduced from under said articles received in said container, to form a fluidized bed;

a spraying means including a spray gun for spraying a binder liquid or a coating liquid onto said articles;

an adhered article removing means for removing adhered articles adhering to said spray gun; and

an adhered article receiving means for receiving said adhered articles removed by said adhered article removing means; whereby at least one of said spraying means and said adhered article removing means is reciprocally movable in the horizontal direction relative to the other, said method including the steps of horizontally reciprocating at least one of said spraying means and said adhered article removing means moves whereby adhered articles on said spray gun are removed by said adhered article removing means and said adhered articles that are removed are received into said adhered article receiving means and granulating or coating said articles by introducing gas from under said articles into said container.

5,589,226

METHOD AND DEVICE FOR APPLYING LIQUID MATERIAL, IN PARTICULAR A HOT MELT, BY MEANS OF A SEQUENTIALLY OPERATING APPLICATOR TO A SUBSTRATE

Herman R. Geul, Leiden, Netherlands, assignor to Nordson Corporation, Westlake, Ohio

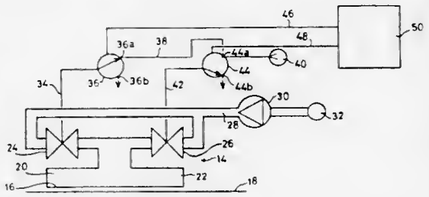
PCT No. PCT/NL93/00113, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO93/24239, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 2, 1993, Ser. No. 347,328

Claims priority, application Netherlands, Jun. 4, 1992, 9200984

Int. Cl.[6] B05D *5/00;* **B05C** *5/00*

U.S. Cl. 427—286 **13 Claims**



1. Method for applying a material pattern by means of a sequentially operating applicator to a substrate moving in a direction of movement relative to said applicator, by way of a control valve means for liquid hot melt adhesive material, said valve means being controllable for opening and closing, and being connected to a material supply, which material pattern in the direction of movement of the substrate, is sub-divided into pattern parts with spacing between them, characterised in that use is made of at least two alternately operating control valves which are connected to the material supply and are made to open and close sequentially with each valve alternately being in the open position when the other valve is in the closed position and the outflow from each two alternately operating control valves being directed to locations on the substrate in a single row of pattern parts in alignment with the direction of travel of the substrate.

5,589,227

METHOD FOR PRESERVING ROLLERS IMMERSED INTO THE MOLTEN ALLOY BATH FOR EXTENDING THE OPERATING LIFE THEREOF

Horacio C. Falia, Remedios de Escalada, and Carlos I. Rojas, Lanús-Buenos Aires, both of Argentina, assignors to Comesi S.A.I.C., Buenos Aires, Argentina

Filed Mar. 30, 1995, Ser. No. 413,310

Claims priority, application Argentina, Aug. 17, 1994, 329118

Int. Cl.[6] B05D *1/00*

U.S. Cl. 427—348 **3 Claims**

1. A process for extending the life of rollers used in formation of steel sheet bands, comprising the steps of immersing the rollers into an alloy bath through gas feeding, applying at least one mechanical scraper means with hard steel cutting edges against each roller surface of the rollers, and providing a source of inert gas to provide a fluid action by injecting said inert gas through an inner portion of said mechanical scraper.

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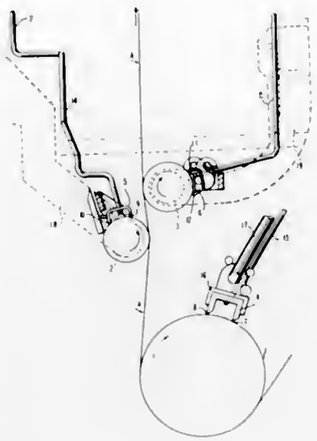


5,589,228
PROCESS FOR COATING VEHICLE BODIES AND AQUEOUS COATING

Egon Wegner, Drensteinfurt; Ulrich Poth, Münster; Lutz-Werner Gross, Haltern, and Klaus Weidemeier, Münster, all of Germany, assignors to BASF Lacke + Farben, AG, Muenster-Hiltrup, Germany

Continuation of Ser. No. 934,624, Oct. 21, 1992, abandoned.
This application Oct. 11, 1994, Ser. No. 321,082
Claims priority, application Germany, Feb. 26, 1990, 40 05 961.8
Int. Cl.[6] B05D *3/02;1/36*
U.S. Cl. 427—407.1 14 Claims

1. A process for coating vehicle bodies, comprising the steps of

(1) applying to a substrate an electro-dipping primer and baking the primer

(2) optionally, applying an intermediate primer, resistant to damage by stone chips and baking separately or together with the filler coat applied in stage (3)

(3) applying a filler and baking the filler and

(4) applying a single- or multi-layer top coating and baking,

in which the intermediate primer and/or filler-coat employed is an aqueous stoving enamel containing as the binder a combination of

(A) a water-dilutable polyurethane resin,

(B) a water-dilutable polyester resin and

(C) an aminoplast resin,

in which component (A) has an acid number from 10 to 60 and a number-average molecular weight of 4000 to 25,000 and is prepared by reacting

(a) a polyester- and/or polyether-polyol having a number-average molecular weight of 400 to 5000, or a mixture of such polyester- and/or polyether-polyols,

(b) a polyisocyanate, or a mixture of polyisocyanates,

(c) a compound which contains in the molecule at least one group which is reactive towards isocyanate groups and at least one group which is capable of anion formation, or a mixture of each compounds, and optionally

(d) an organic compound which contains hydroxyl and/or amino groups and has a molecular weight of 40 to 400, or a mixture of such compounds,

with one another and at least partly neutralizing the reaction product formed, wherein component (A) is employed in an amount of 40 to 70% by weight, component (B) in an amount of 15 to 40% by weight and component (C) in an amount of 8 to 35% by weight, in which the percentage by weight data are based on (A)+(B)+(C)=100% by weight, and component (B) is a water-dilutable polyester resin which has an acid number of 20 to 100, preferably 25 to 45, and a hydroxyl number of 40 to 150, preferably 50 to 80, and can be prepared by reacting

(i) an organic compound containing at least three functional groups, in which at least one of the functional groups is a carboxyl group and the other functional groups are selected from the group consisting of hydroxyl, amino, carboxyl, acid anhydride groups, and mixtures thereof, where an acid anhydride group is counted as two functional groups, and mixtures of such organic compounds,

(ii) a cyclic dicarboxylic acid, or a mixture of cyclic dicarboxylic acids,

(iii) optionally an aliphatic dicarboxylic acid, or a mixture of aliphatic dicarboxylic acids,

(iv) a polyol in which at least one α-C atom is a secondary or tertiary C atom or a member in a carbon-containing ring system, or a mixture of such polyols, and

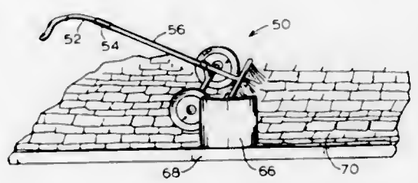
(v) optionally a polyol other than (iv), or a mixture of such polyols,

with one another, the carboxylic acid components ((i)+(ii)+(iii)) and the polyol components ((iv)+(v)) being employed in a molar ratio of 3:4 to 7:8, the molar ratio between (i)+(ii) and (iii) being 50:50 to 100:0, and the molar ratio between (iv) and (v) being 40:60 to 100:0, and at least partly neutralizing the reaction product formed.

5,589,229
COMPOSITION AND METHOD FOR PREVENTING MOSS GROWTH ON ROOFS

Richard Howard, 30311 Camas Swale Rd., Creswell, Oreg. 97426

Continuation-in-part of Ser. No. 120,949, Sep. 14, 1993, Pat. No. 5,366,767. This application Nov. 21, 1994, Ser. No. 342,757
Int. Cl.[6] B05D *7/00;* C09D *5/14*
U.S. Cl. 427—421 2 Claims



2. A method of preventing parasitic growth on a porous weather exposed surface material, the method comprising the steps of:

providing an aqueous penetrant solution having a pH of at least 11.0 comprising Na_2O and SiO_2 at a combined concentration between 10-percent and 30-percent (W/V);

translating a boom along a path across a roof, wherein the boom is substantially parallel to the roof and perpendicular to the direction of the path;

pumping the aqueous penetrant solution through plural nozzles distributed equidistantly across the boom;

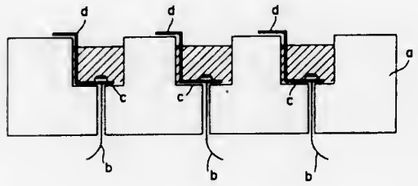
applying at least approximately 0.75 gallons of the solution per 100 square feet of the surface material; and

allowing the solution to dry on and in the surface material at ambient temperatures.

5,589,230
POLYMERIZABLE, CURABLE MOLDING COMPOSITION AND A MOLDING OR COATING PROCESS USING THIS MOLDING COMPOSITION

Yoshitami Yamamura; Nobuhiko Morimoto, and Nobuyuki Tanaka, all of Hyogo-ken, Japan, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Apr. 7, 1995, Ser. No. 418,977
Claims priority, application Japan, Oct. 9, 1992, 4-271463; Mar. 1, 1993, 5-40066
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—493 32 Claims

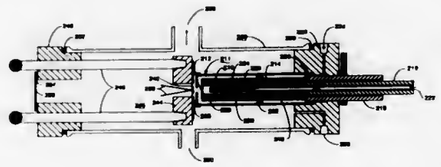


1. A polymerizable curable composition comprising (A) 100 parts by weight of an unsaturated epoxyester resin with an acid value below 3.0, (B) 10 to 40 parts by weight of a polymerizable monomer selected from the group consisting of phenoxyethyl acrylate, 2-acroyloxyethyl-2-hydroxypropyl phthalate and mixtures thereof and (C) 1 to 5 parts by weight of a mixture of hydroxyketone oligomer and 2-hydroxy-2-methyl-1-phenylpropan-1-one.

5,589,231
HALOGEN-ACTIVATED CHEMICAL VAPOR DEPOSITION OF DIAMOND

Robert H. Hauge, Houston, Tex., and Chenyu Pan, Tucson, Ariz., assignors to Rice University, Houston, Tex.

Filed Apr. 4, 1995, Ser. No. 417,050
Int. Cl.[6] B05D *3/06;3/14;* C23C *16/26*
U.S. Cl. 427—561 36 Claims



1. A method of depositing diamond on a substrate, said method comprising:

providing a first gas stream comprising molecular halogen, said first gas stream being substantially free of hydrogen-containing species;

treating said first gas stream so as to dissociate at least a portion of said molecular halogen into atomic halogen;

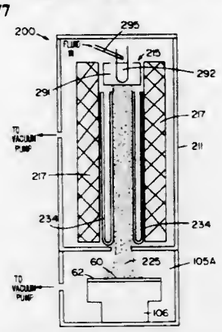
admixing with said first treated gas stream hydrogen gas and a carbon-containing species, which hydrogen gas and carbon-containing species have not been pretreated for activation to a high energy level, to provide a gas stream mixture;

flowing said gas stream mixture over the substrate so as to deposit diamond on at least a portion of said substrate.

5,589,232
METHOD OF MAKING A WEAR COMPONENT BY PLASMA JET CVD

Matthew Simpson, Arlington, Mass., assignor to Norton Company, Worcester, Mass.

Continuation of Ser. No. 773,465, Oct. 9, 1991, Pat. No. 5,411,758. This application Sep. 19, 1994, Ser. No. 308,374
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—577 13 Claims



1. A method of making a wear component, comprising the steps of:

providing a base surface;

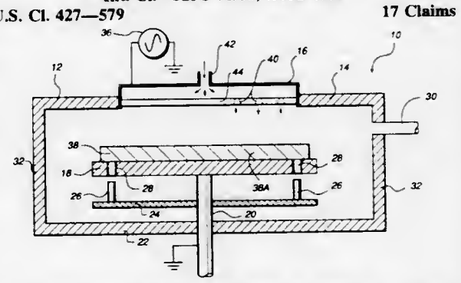
producing a synthetic diamond film by plasma jet chemical vapor deposition having a thickness of at least 20 microns and an equivalent strain of at least 0.08 percent; and

applying said diamond film to said base surface.

5,589,233
SINGLE CHAMBER CVD PROCESS FOR THIN FILM TRANSISTORS

Kam Law, Union City; Robert Robertson, Palo Alto, and Guofu J. Feng, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 174,103, Dec. 28, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,915
Int. Cl.[6] C23C *16/00;* B05D *3/06*
U.S. Cl. 427—579 17 Claims



1. A method of sequentially depositing an intrinsic silicon layer and a doped silicon layer containing a dopant on a substrate positioned in a chemical vapor deposition chamber having interior chamber surfaces without substantially contaminating the intrinsic silicon layer by said dopant, said method comprising the steps of:

depositing simultaneously on said substrate and said interior chamber surfaces a layer of at least one insulating material of a thickness sufficient to cover up any residual dopant particles left on said interior chamber surfaces from a previous deposition cycle,

depositing a layer of intrinsic silicon having a first thickness on top of said at least one insulating material on said substrate, and

depositing a layer of doped silicon having a second thickness on top of said intrinsic silicon on said substrate.

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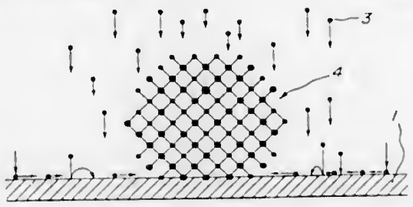
wherein all three depositing steps which comprise a deposition cycle are performed in a single chemical vapor deposition chamber without an in-situ cleaning step between each deposition cycle.

5,589,234

METHOD OF MANUFACTURING ULTRAFINE PARTICLES OF A COMPOUND

Hirotaro Mori, Suita, and Hidehiro Yasuda, Toyonaka, both of Japan, assignors to Osaka University, Osaka-Fu, Japan

Filed Dec. 27, 1993, Ser. No. 173,113
Claims priority, application Japan, Jun. 23, 1993, 5-174650
Int. Cl.[6] B05D *3/06;* **C23C** *16/00*
U.S. Cl. 427—597 **5 Claims**



1. A method of manufacturing ultrafine particles of a compound consisting of at least two elements on the surface of a substrate comprised of at least one material selected from the group consisting of an organic material and an inorganic material, the method comprising:

(a) depositing a first element onto a surface of the substrate by a method selected from the group consisting of vacuum deposition, sputtering, chemical vapor deposition (CVD), and electron beam deposition, to provide a layer of particles of the first element, each of the particles having a particle size ranging from 2 to 50 nm, which particle size is effective to permit spontaneous alloying;

(b) depositing successively at least one additional element onto the layer of the first element on the surface of the substrate by a method selected from the group consisting of vacuum deposition, sputtering, chemical vapor deposition (CVD), and electron beam deposition, to provide respective layers of particles of the at least one additional element, each of the particles of the respective at least one additional element having a particle size ranging from 2 to 50 nm, which particle size is effective to permit spontaneous alloying, the successive depositions taking place at respective deposition rate ranges which are effective for forming a compound by spontaneously alloying the first element and the at least one additional element over a time period effective to provide a preselected area density; and

(c) reacting the layers of particles on the substrate at a reaction temperature ranging from below 32° C. to −173° C., and under a vacuum ranging from 10^{-11} to 10^{-1} Torr to spontaneously alloy the first element and the at least one additional element.

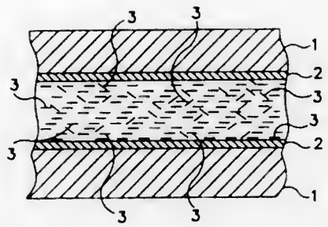
5,589,235

NONLINEAR OPTICAL MATERIAL AND ITS METHOD OF MANUFACTURE

Kazufumi Ogawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 681,994, Apr. 8, 1991, abandoned.
This application Jun. 11, 1993, Ser. No. 76,284
Claims priority, application Japan, Apr. 13, 1990, 2-98499
Int. Cl.[6] C09K *19/00*
U.S. Cl. 428—1 **10 Claims**

1. A nonlinear optical material having a high Secondary Harmonic Generation effect resulting from:



forming an organic orientation film on a surface of each of two substrates;

positioning the surface of each of said substrates having said organic orientation film in a face to face relationship and establishing a gap therebetween;

introducing into said gap energy-beam sensitive liquid-crystal monomer molecules having a dipole moment of a magnitude so that said monomer molecules become oriented in an aligned direction when exposed to a magnetic field;

aligning said energy beam sensitive monomer molecules in a specified direction by exposure to a magnetic field; and

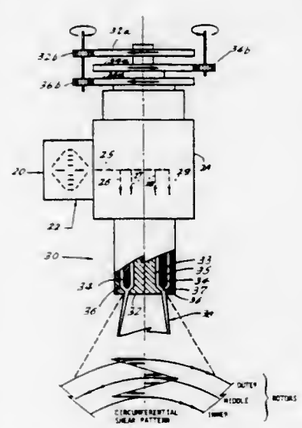
exposing said substrates containing said monomer to radiation in an amount between 10 and 100M rad. to yield a cross linked polymer.

5,589,236

COEXTRUSION OF LIQUID CRYSTAL POLYMERS AND THERMOPLASTIC POLYMERS

Andrew C. Harvey, Waltham; Richard W. Lusignea, Brighton, and Leslie S. Rubin, Newton, all of Mass., assignors to Superex Polymer Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 125,919, Sep. 23, 1993, abandoned, and Ser. No. 126,043, Sep. 23, 1993, abandoned, said Ser. No. 125,919and Ser. No. 126,043, , each is a division of Ser. No. 778,812, Dec. 12, 1991, Pat. No. 5,288,529, which is a continuation-in-part of Ser. No. 367,433, Jun. 16, 1989, abandoned. This application Mar. 24, 1994, Ser. No. 217,236
Int. Cl.[6] C09K *19/00*
U.S. Cl. 428—1 **25 Claims**



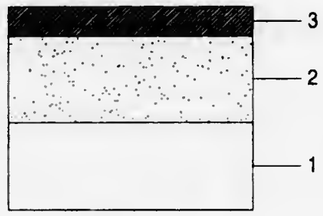
1. A multilayer film prepared from one or more liquid crystal polymers (LCPs) and one or more thermoplastic polymers (TPs) having at least one LCP layer which has a controlled molecular orientation.

5,589,237

REVERSIBLE DISPLAY MEDIUM

Ryojiro Akashi; Takashi Morikawa; Masanobu Ninomiya, and Takashi Uematsu, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 262,910
Claims priority, application Japan, Jun. 25, 1993, 5-177628; Sep. 7, 1993, 5-246147; Oct. 6, 1993, 5-272969; May 11, 1994, 6-120753
Int. Cl.[6] C09K *19/52;* **G02F** *1/137*
U.S. Cl. 428—1 **9 Claims**



1. A reversible display medium comprising a substrate having a recording layer containing a side chain polymeric liquid crystal repeatedly switchable between a transparent state and a light-scattered state by the action of at least one of heat, an electrical field, and a magnetic field.

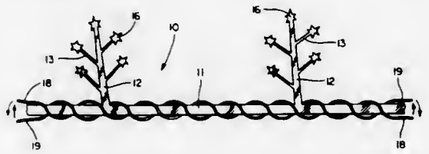
wherein said side chain polymeric liquid crystal is a copolymer comprising at least a repeating unit derived from a liquid crystal monomer and a repeating unit derived from a non-liquid crystal monomer having a hydrogen bond-forming substituent, said side chain polymeric liquid crystal has a multi-domain structure in which the domain diameter at the maximum of the domain number distribution is not greater than 3 μm.

5,589,238

DECORATIVE GARLAND

Edward Ruff, Boca Raton, Fla., assignor to Santa's Best, Northfield, Ill.

Filed Sep. 28, 1995, Ser. No. 535,946
Int. Cl.[6] A41G *1/04*
U.S. Cl. 428—10 **14 Claims**



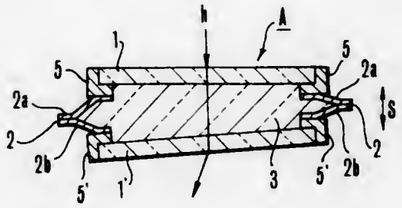
1. A garland comprising an elongated base ribbon and a plurality of annealed metal wires spirally wrapped around said base ribbon member forming a garland without spring back characteristics.

5,589,239

VARIABLE-ANGLE OPTICAL DEVICE WITH OPTICALLY TRANSPARENT SUBSTANCE

Haruo Tomono, Kanagawa-ken; Naoki Kobayashi; Toshiyuki Nakajima, both of Tokyo; Takashi Kai, Kanagawa-ken; Masayoshi Sekine, Tokyo; Masahiro Watabe, and Kazuhiro Ohki, both of Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 429,613, Oct. 31, 1989, abandoned.
This application Sep. 14, 1993, Ser. No. 120,230
Claims priority, application Japan, Nov. 2, 1988, 63-277646; Nov. 2, 1988, 63-277647; Nov. 2, 1988, 63-277648; Apr. 28, 1989, 1-107742
Int. Cl.[6] G02B *3/14*
U.S. Cl. 428—34 **22 Claims**



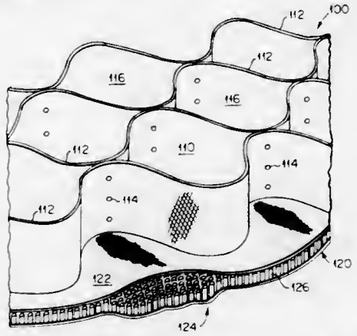
1. An optical element in which an optically transparent substance is sandwiched between transparent paired plate-shaped elements by utilizing a connection member capable of deforming, and the angle formed by said paired plate-shaped elements is caused to vary by a force applied thereto from the outside, whereby a predetermined optical characteristic for a passing light ray is obtained, wherein said connection member is constructed from a high-molecular weight polymeric material that is capable of being molded and said optically transparent substance comprises silicone oil or modified silicone oil.

5,589,240

MULTIPLE CELLULAR CONFINEMENT ASSEMBLY FOR PLANT PROPAGATION

Ronald A. Hunter, Finksburg, Md., assignor to Atlantic Construction Fabrics, Inc., Richmond, Va.

Filed Mar. 28, 1995, Ser. No. 412,780
Int. Cl.[6] B29D *22/00;* **A01G** *9/02*
U.S. Cl. 428—34.1 **5 Claims**



1. A compressible cellular container assembly (**100**) for plant propagation which is confineable in subsoil of the ground, comprising:

a) collapsible linked two-layer, open ended structure containers (**110**) formed of opposed container walls (**112**), said containers being of volute horizontal cross-section and bonded by

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weldment (114) at opposed contacting wall portions to form multiple cells (116), for retention of a soil mix and an associated plant;

b) a permeable soil drain board (120), upon which the soil mix structure containers (110) are supported, said drain board defining a fluid permeable mat (124) having pylons (126); said mat resting upon a foraminous screen (122);

c) an impermeable ground liner (130) resting within a cavity of subsoil of the ground, said liner being interposed between ground and drainage board (120) to confine the container (110) and drainage board (120) on at least three sides thereof;

d) a drainage means (140) for the liner to drain recyclable water and fertilizer from the drainage means.

5,589,241

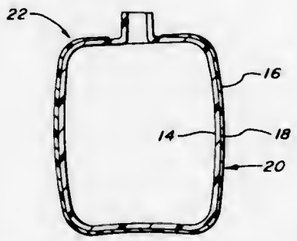
FUEL TANK HAVING AN INTEGRALLY MOLDED PERMEATION BARRIER

Ernest D. Stiles, St. Clair Shores, and Dale L. Hartsock, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1992, Ser. No. 990,497

Int. Cl.[6] B65D *1/26*

U.S. Cl. 428—36.9 **3 Claims**



1. A blow-molded polymeric fuel tank having a permeation retardant laminate on a surface of said tank, said laminate consisting of a polymeric carrier film having first and second surfaces and an uninterrupted permeation retardant coating applied to said first surface of said film, said second surface of said film being welded to said tank surface.

5,589,242

HOUSING LINING

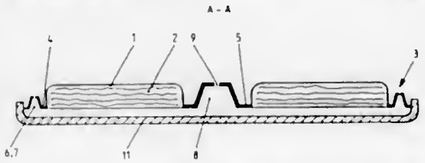
Reinhard Stief, Weinheim; Roger Schork, Mörlenbach; Gerhard Müller-Broll, Rimbach; Thomas Jost, Weinheim; Manfred Mattutat, Ladenburg, and Klaus-Dieter Schmitt, Gorxheimertal, all of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Dec. 9, 1993, Ser. No. 164,182

Claims priority, application Germany, Dec. 10, 1992, 42 41 515.2

Int. Cl.[6] E04B *1/82*

U.S. Cl. 428—45 **8 Claims**



1. A housing lining comprising a sound-absorbent layer of fibers; wherein the housing lining includes a supporting structure comprising at least a supporting frame located at a peripheral edge of said layer of fibers;

wherein said supporting structure is formed of a first portion of fibers, wherein said first portion of fibers comprises compressed and glued fibers;

wherein said supporting structure substantially bounds at least one intermediate area formed of a second portion of fibers;

wherein the fibers in said supporting structure are more compressed than the fibers in said intermediate area; and

wherein said supporting structure comprises at least one cup-shaped convexity forming a Helmholtz resonator with an opening for air to pass through.

5,589,243

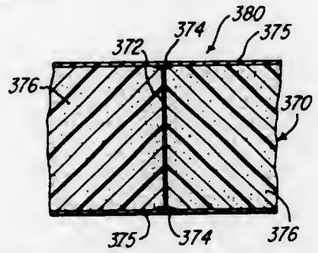
REINFORCED FOAM CORES AND METHOD AND APPARATUS OF PRODUCTION

Stephen W. Day, Dayton, Ohio, assignor to Webcore Technologies, Inc., Centerville, Ohio

Continuation-in-part of Ser. No. 102,892, Aug. 6, 1993, Pat. No. 5,462,623, which is a continuation-in-part of Ser. No. 877,985, May 4, 1992, abandoned. This application Jul. 17, 1995, Ser. No. 503,205

Int. Cl.[6] B32B *3/10;3/18*

U.S. Cl. 428—56 **24 Claims**



1. A reinforced foam core panel adapted for use between generally parallel skins, comprising a plurality of boards of rigid plastics foam material with each board having opposite faces, a strip of porous and fibrous flexible web material overlying at least one of said faces of each said board, said boards of foam material arranged in a stack with said strips of web material disposed between said boards, means for connecting said boards of rigid foam material and said strips of porous and flexible fibrous web material together while maintaining substantial porosity throughout said strips of web material to form a core panel with said boards having opposite side surfaces and with said strips of web material having edge portions extending to said opposite side surfaces, said side surfaces of said boards being exposed for receiving an adhesive resin for attaching the skins to said side surfaces and to said edge portions of said strips of web material, the porosity of said strips of web material providing for the flow of resin through said strips to form integral tie webs connecting the skins, said boards of foam material defining fillet recesses within said side surfaces adjacent said edge portions of said strips of web material, and said recesses are adapted to receive the resin for increasing the bond of said strips to said skins.

5,589,244

MAGNETO-OPTICAL DISC

Kunio Takada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

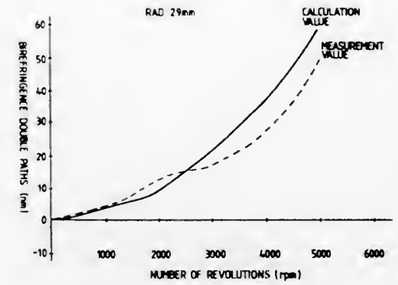
Filed Feb. 7, 1994, Ser. No. 192,749

Claims priority, application Japan, Feb. 16, 1993, 5-026932

Int. Cl.[6] G11B *5/66;* **B32B** *3/02*

U.S. Cl. 428—64.3 **4 Claims**

1. A magneto-optical disc comprising a resin substrate and a magneto-optical film, wherein a birefringence distribution of said substrate in a static state is set so that a disc phase difference during rotation of the disc is eliminated.



5,589,245

TEXTILE SPACER MATERIAL, OF VARIABLE THICKNESS, PRODUCTION PROCESS AND USES FOR IT

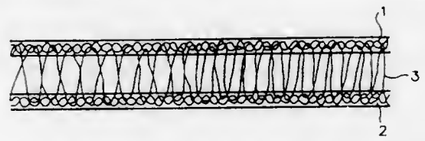
Friedrich Roell, Biberach, Germany, assignor to TECNIT-Technische Textilien und Systeme GmbH, Laupheim, Germany

Filed Feb. 22, 1994, Ser. No. 200,185

Claims priority, application Switzerland, Feb. 22, 1993, 00540/93

Int. Cl.[6] B32B *3/26;5/26*

U.S. Cl. 428—85 **12 Claims**



1. Textile spacer material having at least an upper and a lower knitted covering layer, which are connected by at least one pile thread, at least one of said covering layers comprising inlaid weft or warp yarns, wherein at least one of the inlaid yarns is introduced into said one covering layer in a direction transverse to the direction of the pile thread.

5,589,246

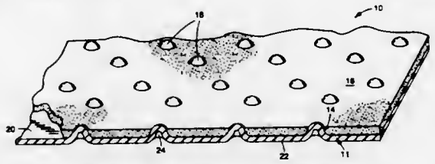
HEAT-ACTIVATABLE ADHESIVE ARTICLE

Clyde D. Calhoun, Stillwater, and David C. Koskenmaki, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1994, Ser. No. 324,333

Int. Cl.[6] C09J *7/02*

U.S. Cl. 428—120 **25 Claims**



1. A heat-activatable adhesive article comprising:

(a) a substantially laterally stable heat recoverable carrier film of memory shaped material and having at least one surface comprising a recessed surface portion and a raised surface portion therein; and

(b) an adhesive layer in the recessed surface portion in an amount such that the adhesive does not extend above the raised surface portion thereby forming an exposed raised surface portion.

5,589,247

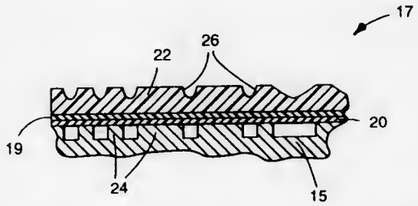
MAGNETIC RECORDING MEDIUM HAVING AN EMBOSSED BACKCOAT LAYER

David A. Wallack, Ventura, Calif.; Donald M. Lewis, Hudson Township, St. Croix County, Wis.; John D. Munter, Oakdale; Peter J. Silbernagel, Woodbury, both of Minn.; Robert V. Heiti, Troy Township, St. Croix County, Wis., and Yuko Yoshida, Kanagawa, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 353,959, Dec. 12, 1994, abandoned, which is a continuation of Ser. No. 994,930, Dec. 22, 1992, abandoned. This application Jan. 26, 1996, Ser. No. 592,770

Int. Cl.[6] G11B *5/68*

U.S. Cl. 428—141 **6 Claims**



1. A magnetic recording medium comprising a substrate, a magnetizable layer on a front side thereof and a crosslinked polymeric coating on the backside thereof wherein the coating on the backside ranges from about 0.2 to 3 microns thick and has a smooth surface having a surface roughness not greater than 0.05 microns Ra except that said coating includes in the otherwise smooth surface a plurality of depressions having a depth ranging from 1–50% of the average thickness of said coating and wherein the ratio of the greatest width of a depression to the depth of the depression is from 100/1 to 10,000/1.

5,589,248

SHAPED GLASS SHEET AND A PROCESS FOR THE PREPARATION THEREOF

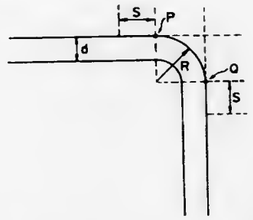
Shotaro Tomozane; Hirokazu Kidou, and Yukikazu Nakabayashi, all of Toyama, Japan, assignors to Suntec Corporation, Toyama, Japan

Filed Sep. 17, 1993, Ser. No. 123,375

Claims priority, application Japan, Sep. 18, 1992, 4-273386; Sep. 21, 1992, 4-274802; Feb. 25, 1993, 5-059342; Mar. 1, 1993, 5-062491

Int. Cl.[6] B32B *1/00*

U.S. Cl. 428—174 **8 Claims**



1. A shaped glass sheet having at least one linear bend and two straight sections extending from the bend, characterized in that a radius of curvature of an outer circumference of the bend transverse to the bend is at most 4 times a thickness of the glass sheet and the straight sections of the shaped glass sheet are substantially flat, and wherein the thickness of the glass sheet is 3 mm or more.

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5,589,249

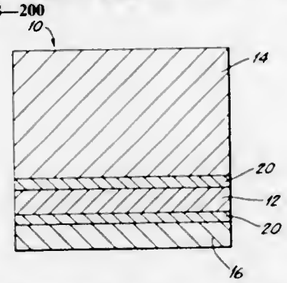
MEDICAL COMPOSITE WITH DISCONTINUOUS ADHESIVE STRUCTURE

Carl A. Bodford, Charlottesville; Stephen O. Chester, Staunton, and Rahul K. Nayak, Waynesboro, all of Va., assignors to Poly-Bond, Inc., Waynesboro, Va.

Continuation-in-part of Ser. No. 389,029, Feb. 15, 1995, which is a division of Ser. No. 220,671, Mar. 31, 1994, abandoned, which is a division of Ser. No. 2,421, Jan. 8, 1993, Pat. No. 5,342,469. This application Jul. 18, 1995, Ser. No. 504,066

Int. Cl.[6] B32B *3/00;7/06;7/10*

U.S. Cl. 428—200 22 Claims



1. A vapor permeable, liquid impermeable protective fabric composite comprising:

(A) a vapor permeable, non-woven fabric substrate formed of a material selected from the thermoplastic polyolefin polymers;

(B) at least two vapor permeable and liquid impermeable film substrates; and

(C) a thermoplastic adhesive bonding said substrates together into a protective fabric/film/film composite;

said fabric substrate having a weight of 0.43–3.0 OSY and percentage bond area of 5–45%;

said composite being characterized by passing a viral barrier test (modified ASTm ES 22) at a level of at least 3 psi and having a moisture vapor transmission rate (ASTM F 1249) of at least 2000 gm/m^2/24 hours.

5,589,250

RESIN COMPOSITIONS AND PRINTED CIRCUIT BOARDS USING THE SAME

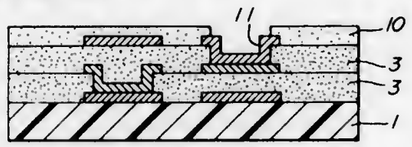
Motoo Asai, and Ritsuko Kato, both of Gifu, Japan, assignors to Ibiden Co., Ltd., Gifu, Japan

Continuation of Ser. No. 225,331, Apr. 8, 1994, abandoned. This application Aug. 23, 1995, Ser. No. 518,358

Claims priority, application Japan, Apr. 12, 1993, 5-109961

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—209 9 Claims



1. A multilayer printed circuit board comprising:

a substrate;

a first conductor circuit formed on the substrate;

an adhesive layer formed on the conductor circuit by dispersing 5–350 parts by weight of particles of a cured heat-resistant resin soluble in an acid or an oxidizing agent into 100 parts by weight of a matrix of an uncured photosensitive resin hardly soluble in the acid or oxidizing agent;

a second conductor circuit formed on the adhesive layer and electrically connected to the first conductor circuit through a via-hole;

wherein the particles of the cured heat-resistant resin include 0.10–1.50% by weight of coloring matter selected from the group consisting of phthalocyanine, phthalocyanine derivatives and cyanine color.

5,589,251

RESONANT TAG AND METHOD OF MANUFACTURING THE SAME

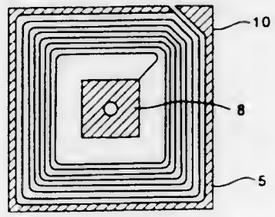
Hideaki Imaichi; Takeshi Matsumoto; Yuji Suzuki; Koichi Himura, and Tadayoshi Haneda, all of Chigasaki, Japan, assignors to Tokai Electronics Co., Ltd., Chigasaki, Japan

Division of Ser. No. 9,855, Jan. 27, 1993, Pat. No. 5,447,779, which is a continuation-in-part of Ser. No. 827,509, Feb. 28, 1992, abandoned, which is a continuation of Ser. No. 634,529, Dec. 27, 1990, Pat. No. 5,108,822. This application Aug. 22, 1995, Ser. No. 517,690

Claims priority, application Japan, Aug. 6, 1990, 2-206791

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—209 9 Claims



1. A resonant tag comprising:

a first electrode plate having a first area;

a second electrode plate having a second area, said second area being larger than said first area;

a composite dielectric between said first and second electrode plates and having a third area greater than said second area, said composite dielectric having a thinned portion substantially equal in area to said first area and separating said first electrode from an oppositely corresponding and coextensive portion of said second electrode, said thinned portion of said composite dielectric including material of a first dielectric strength and at least one area within said material of a second dielectric strength lower than said first dielectric strength; and

an inductor formed on said composite dielectric and electrically connected to said first and second electrode plates to form a resonant circuit, said at least one area of said composite dielectric having said second dielectric strength providing preferred paths for electrical breakdown of said resonant circuit.

5,589,252

GAS BARRIER LAMINATED MATERIAL

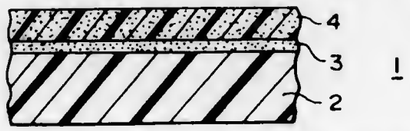
Ryukichi Matsuo, and Toshiaki Yoshibara, both of Saitama, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 314,802

Claims priority, application Japan, Sep. 30, 1993, 5-245443; Mar. 31, 1994, 6-064187

Int. Cl.[6] B32B *7/02;27/40*

U.S. Cl. 428—216 10 Claims



1. A gas barrier laminated material comprising a polymer sheet of film substrate, and an inorganic compound layer having a thickness of from 50 angstroms to 3,000 angstroms and a protective layer having a thickness of from 0.01 μm to 100 μm which are laminated in this order, wherein said protective layer is formed by coating on said inorganic compound layer a coating composition containing a metal alkoxide or a hydrolyzate thereof and from 5 parts by weight to 400 parts by weight of an isocyanate compound having two or more isocyanate groups based on 100 parts by weight of the metal alkoxide or hydrolyzate thereof, followed by heat drying.

5,589,253

Patent Not Issued For This Number

5,589,254

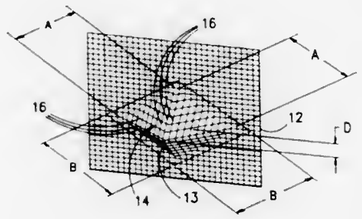
METHOD FOR IMPROVING THE ENERGY ABSORPTION OF A HIGH TENACITY FABRIC DURING A BALLISTIC EVENT

Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 880,045, May 7, 1992, Pat. No. 5,466,503. This application May 15, 1995, Ser. No. 441,470

Int. Cl.[6] F41H *1/02;1/04*

U.S. Cl. 428—221 2 Claims



1. A method for making ballistic-resistant fabric which comprises of cutting a plurality of strips of fabric each having a length and a width, made from fibers having a tenacity of at least ten grams/denier, at least one said strip of fabric having a ballistic failure ratio less than one for an impact with a projectile having a velocity of about at least five hundred feet per second, and a ratio of said length of said strip of fabric to said width of said strip of fabric greater then a reciprocal squared of said ballistic failure ratio and attaching said strips of fabric together in substantially overlapping relationship.

5,589,255

ADHESIVE FOR ELECTROLESS PLATING, PRINTED CIRCUIT BOARDS AND METHOD OF PRODUCING THE SAME

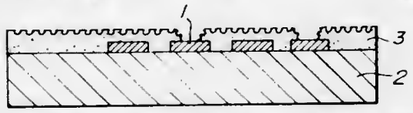
Ryo Enomoto, and Motoo Asai, both of Ogaki, Japan, assignors to Ibiden Co., Ltd., Gifu, Japan

Continuation of Ser. No. 41,874, Apr. 2, 1993, abandoned, which is a continuation of Ser. No. 692,729, Apr. 29, 1991, abandoned, which is a division of Ser. No. 344,968, Apr. 28, 1989, Pat. No. 5,055,321. This application Jun. 3, 1994, Ser. No. 253,582

Claims priority, application Japan, Apr. 28, 1988, 63-104044; May 30, 1988, 63-130253; May 30, 1988, 63-130254

Int. Cl.[6] C09J *7/02*

U.S. Cl. 428—261 11 Claims



1. An adhesive suitable for use in electroless plating used in connection with printed circuit broads, comprising:

(a) a heat-resistant resin which is slightly soluble in the presence of an oxidizing agent;

(b) a plurality of heat-resistant particles which are easily soluble in said oxidizing agent when dispersed in said heat-resistant resin, said heat-resistant particles being selected from the group consisting of (1) quasi particles obtained by adhering at least one of heat-resistant resin fine powders having an average particle size of not more than 2 μm and inorganic fine powders having an average particle size of not more than 2 μm to surfaces of heat-resistant particles having an average particle size of 2–10 μm through heating or with a binder, and (2) agglomerated particles obtained by agglomerating heat-resistant resin fine powders having an average particle size of not more than 2 μm into an average particle size of 2–10 μm, through heating or with a binder and then sieving them, and mixtures thereof.

5,589,256

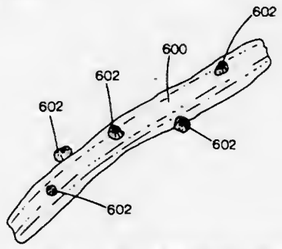
PARTICLE BINDERS THAT ENHANCE FIBER DENSIFICATION

Michael R. Hansen, Seattle, and Richard H. Young, Sr., Renton, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 17, 1992, Ser. No. 931,279

Int. Cl.[6] A01N *25/34;* A61F *13/20;13/46;* A61L *15/16;15/42;15/44, 15/60;* B32B *5/24;29/04;31/12;33/00;* D04H *1/58;1/64;1/72;* D21H *11/16;11/20*

U.S. Cl. 428—283 56 Claims



1. A method of producing fibers with adhered particles comprising:

providing fibers that have hydrogen bonding functional sites;

adding particles to the fibers, wherein the particles have a hydrogen bonding or coordinate covalent bonding functionality;

interposing a binder having a functional group capable of forming a binder-fiber hydrogen bond as well as a functional group

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capable of forming a binder-particle hydrogen bond or a binder-particle coordinate covalent bond between fibers having hydrogen bonding functional sites and particles having a hydrogen bonding or coordinate covalent bonding functionality, the binder selected from the group consisting of (a) a polymeric binder with repeating units, wherein each repeating unit has a functional group capable of forming a hydrogen bond or a coordinate covalent bond with the particles, or a hydrogen bond with the fibers, and (b) a nonpolymeric organic binder, whereby a substantial portion of the particles with said functional groups are bound in particulate form to the fibers primarily by a hydrogen bond or coordinate covalent bond; and

thereafter densifying the fibers with their bound particles by applying external pressure to the fibers.

52. A fiber product comprising:

individualized fibers densified by applying pressure, having a density of 0.1 to 0.7 g/cc, and hydrogen bonding functionalities; and

particles that are bound to the fibers by a binder interposed between the particles and the fibers, the particles having a hydrogen bonding or coordinate covalent bonding functionality, and the binder having a functional group capable of forming a binder-particle hydrogen bond or a binder-particle coordinate covalent bone and a functional group capable of forming a binder-fiber hydrogen bond, the binder selected from the group consisting of (a) a polymeric binder with repeating units, wherein each repeating unit has a functional group capable of forming a hydrogen bond or a coordinate covalent bond with the particles, or a hydrogen bond with the fibers; and (b) a nonpolymeric organic binder, wherein the product comprises 0.05–80% of said bound particles, said bound particles bound to the fibers primarily by a hydrogen bond or coordinate covalent bond.

5,589,257

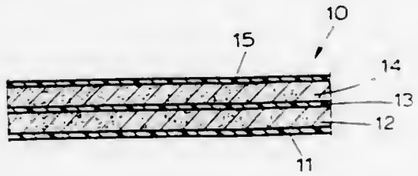
LOW PERMEABILITY GEOSYNTHETIC CLAY LINER AND METHOD OF MANUFACTURE THEREOF

Richard W. Carriker, Woodstock, and John M. Fuller, Dunwoody, both of Ga., assignors to Claymax Corporation, Chicago, Ill.

Filed May 8, 1995, Ser. No. 436,540

Int. Cl.[6] B32B *19/06*

U.S. Cl. 428—284 **15 Claims**



1. An improved flexible geosynthetic clay liner having a water permeability less than 5×10^{-10} cm/sec comprising:

a primary carrier sheet of fabric;

a first layer of bentonite disposed on top of the primary carrier sheet;

an intermediate polymeric sheet or fabric layer disposed on top of the first layer of bentonite;

a second layer of bentonite disposed on top of the intermediate layer; and

a cover sheet of fabric disposed on top of the second layer of bentonite.

5,589,258

NON-WOVEN FABRIC COMPRISING AT LEAST ONE SPUNBONDED LAYER

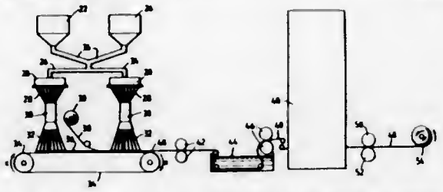
Peter Maddern, and Kenneth J. G. Currie, both of Clwyd, Great Britain, assignors to Kimberly-Clark Limited, Kent, England

Continuation of Ser. No. 380,178, Jul. 14, 1989, abandoned, which is a continuation of Ser. No. 130,386, Nov. 20, 1987, abandoned. This application Nov. 26, 1991, Ser. No. 799,927

Claims priority, application United Kingdom, Mar. 27, 1986, 8607803

Int. Cl.[6] B32B *5/26;31/20;31/22*

U.S. Cl. 428—286 **11 Claims**



1. A laminate comprising a layer of spunbonded polymeric nonwoven filaments and a layer of meltblown polymeric fibers, the laminate having been treated with a thermal stabilizing agent forming an exterior fiber casing on at least one of said filaments and fibers, thermally pattern bonded and subsequently to the pattern bonding of the laminate, calendered by passing through a nip between two rolls including a smooth, hot roll resulting in increased surface abrasion resistance of an average weight loss per thousand rubs of 10.5 milligrams or less while retaining an open fiber structure providing an average air permeability of at least 11 dm/min per 20 cm^2 measured by DIN Std 53 887.

5,589,259

INK JET RECORDING PAPER

Kiyoshi Hosoi, and Tsukasa Matsuda, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1995, Ser. No. 494,545

Claims priority, application Japan, Jun. 30, 1994, 6-149538

Int. Cl.[6] B41M *5/00*

U.S. Cl. 428—323 **6 Claims**

1. An ink jet recording paper, which comprises:

(a) a base paper having an apparent density according to JIS-P8118 of from 0.80 to 0.90 g/cm^3, an air permeability according to JIS-P8117 of from 5 to 15 seconds and a formation index of not less than 20; and

(b) a coating layer provided on at least one surface of said base paper, said coating layer having a dried coverage of from 4 to 10 g/m^2 and comprising (1) a white pigment having a BET specific surface area of from not less than 250 m^2/g to less than 400 m^2/g and (2) an adhesive.

5,589,260

METHOD AND APPARATUS FOR PRODUCING PLASTIC PRODUCTS

Guy Ben Zvi, Kibbutz Ramat Yohanan; Shlomo Nevo, Neot Afeka, and Michael Berman, Kfar Yona, all of Israel, assignors to Palboard Ltd., Givataylm, Israel

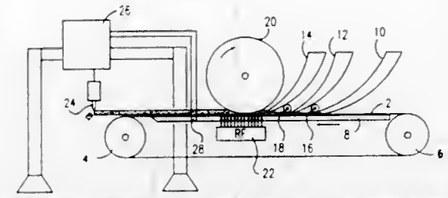
Filed Jul. 19, 1994, Ser. No. 277,184

Claims priority, application Israel, Jul. 23, 1993, 106460

Int. Cl.[6] B29C *35/10;* **B32B** *5/16*

U.S. Cl. 428—327 **12 Claims**

1. A method of producing plastic products, comprising: cutting into pieces a thermoplastic material having a loss factor higher than 0.005 such as to have a high absorbence of radio-frequency radiation, the pieces being cut so that the bulk of the pieces have a size of 2–10 mm in their largest dimension; mixing said pieces of



thermoplastic material with at least one other particulate material which is an organic plastic material having a loss factor lower than 0.005 so as to have a low absorbence of radio-frequency radiation; depositing said mixture on a supporting surface; applying radio-frequency heating radiation to said mixture sufficient to soften only the outer surfaces of said pieces of thermoplastic material by dielectric heating, while applying pressure to said mixture to bond the mixture together by sintering; and removing said sintered mixture from said supporting surface.

9. Apparatus for producing plastic products, comprising: a table extending longitudinally of the apparatus; a first conveyor belt moving longitudinally over said table for receiving pieces of thermoplastic material to be sintered; a second conveyor belt moving with and aligned over said first conveyor belt at an angle which converges therewith from one end to the opposite end of the first conveyor belt for applying gradually increasing pressure to the pieces of thermoplastic materials on said first conveyor belt; a plurality of pairs of radio-frequency electrodes spaced longitudinally along the length of, and straddling, the two conveyor belts and an RF generator connected to said electrodes for applying sufficient heat to soften the outer surfaces of the pieces of thermoplastic material at the same time as the pieces of thermoplastic material are heated by said radio-frequency radiation to sinter them into a layer on said first conveyor belt.

11. A plastic sintered product including pieces of a thermoplastic material having a loss factor higher than 0.005 such as to have a high absorbence of radio-frequency radiation, the bulk of said pieces having a size of 2–10 mm in the largest dimension, said pieces being mixed with pieces of an organic plastic material having a loss factor lower than 0.005 so as to have a low absorbence of radio-frequency radiation, said sintered product being made according to the method of claim 1.

5,589,261

PERPENDICULAR MAGNETIC FILM, PROCESS FOR PRODUCING THE SAME AND MAGNETIC RECORDING MEDIUM HAVING THE SAME

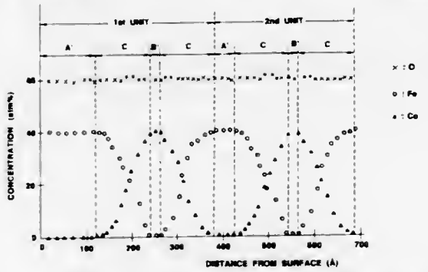
Kousaku Tamari, Hiroshima, Japan, assignor to Toda Kogyo Corporation, Japan

Continuation of Ser. No. 36,209, Mar. 23, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,135

Claims priority, application Japan, Mar. 30, 1992, 4-105460

Int. Cl.[6] G11B *5/66;* **B32B** *5/16;* **B05D** *5/12;* **C23C** *14/00*

U.S. Cl. 428—332 **12 Claims**



1. A multilayer perpendicular magnetic film having a least four layers formed of at least two (A)/(B) or (B)/(A) units, the units disposed one atop the other, each unit having a layer (A) having a spinel crystal structure and represented by the following formula:

$$A_xFe_{3-x}O_4$$

wherein A represents Co, Ni and Mn, or x is not more than 1, disposed a layer (B) having a spinel crystal structure and represented by the following formula:

$$B_yCo_{3-y}O_4$$

wherein B represents Fe, Ni or Mn, and y is not more than 1, the oxide of each of said layer (A) and said layer (B) being respectively composed of spinel crystals having an average crystal grain size of 30 to 100 Å, the number of the (A)/(B) units or (B)/(A) units being 2 to 30, and the thickness of one unit (A)/(B) or (B)/(A) being less than 1000 Å.

5,589,262

PERPENDICULAR MAGNETIC RECORDING MEDIUM HAVING A SOFT MAGNETIC UNDERLAYER WITH A STRIPE MAGNETIC DOMAIN STRUCTURE

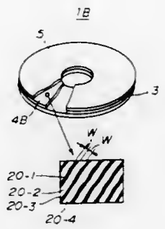
Katsumi Kiuchi, Ebina; Hiroaki Wakamatsu, Yokohama; Fumitake Suzuki, Kawasaki, and Takao Koshikawa, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 144,613, Nov. 1, 1993, abandoned, and Ser. No. 531,339, May 31, 1990, abandoned. This application Aug. 8, 1994, Ser. No. 286,951

Claims priority, application Japan, May 31, 1989, 1-138273; May 31, 1989, 1-138274; Nov. 20, 1989, 1-302719; Dec. 19, 1989, 1-329240; Dec. 20, 1989, 1-330667

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—336 **15 Claims**



1. A perpendicular magnetic recording medium for use in a magnetic recording/reproducing apparatus which has a magnetic head for recording/reproduction, said perpendicular magnetic recording medium comprising:

a substrate;

a magnetic recording layer having a perpendicular magnetic anisotropy;

a soft magnetic under layer interposed between said substrate and said magnetic recording layer and subject to undergoing domain wall motion when the perpendicular magnetic recording medium is Used in the magnetic recording/reproducing apparatus as a result of a stray magnetic field inherently existing within the magnetic recording/reproducing apparatus in the vicinity of the magnetic head thereof, the soft magnetic underlayer having a permeability selected to be in a range of from 50 to 800 and a thickness selected to be in a range of from 4 μm to 20 μm; and

a stripe magnetic domain structure, formed in said soft magnetic under layer, suppressing motion of the domain walls of said soft magnetic under layer at least with respect to an external magnetic field having a field strength which is greater than 0 and less than or equal to 10 Oe, where the stray magnetic field has a maximum field strength of 10 Oe.

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5,589,263

MAGNETIC RECORDING MEDIUM HAVING A FERROMAGNETIC METAL THIN FILM, A DRY ETCHED LAYER, A CARBONACEOUS FILM, AND A LUBRICANT FILM

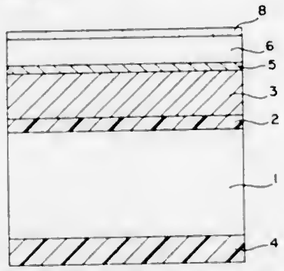
Hideyuki Ueda; Hiroshi Seki, both of Osaka; Kenji Kuwahara, Ikoma; Mikio Murai; Kiyosi Takahasi, both of Osaka; Masaru Odagiri, Kawanishi, and Sadayuki Okazaki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1994, Ser. No. 365,216

Claims priority, application Japan, Dec. 28, 1993, 5-337781

Int. Cl.[6] G11B *5/72*

U.S. Cl. 428—336 **25 Claims**



1. A ferromagnetic metal thin film recording medium comprising a non-magnetic substrate, a ferromagnetic metal thin film comprising aggregates of columnar crystal particles of cobalt formed on said non-magnetic substrate, a dry etched layer which is formed in a surface layer of said ferromagnetic metal thin film and contains oxygen atoms in a higher concentration than the remaining part of said ferromagnetic metal thin film, a carbonaceous film formed on said dry etched layer of said ferromagnetic metal thin film, and in which an atomic ratio of oxygen to carbon measured at an interface between said carbonaceous film and said dry etched layer is at least 0.50:1, and a lubricant layer formed on said carbonaceous film.

5,589,264

UNSPUN ACRYLIC STAPLE FIBERS

Han S. Yoon; Tae W. Son; Byung C. Kim; Chul J. Lee; Byung G. Min, all of Seoul, and Jae W. Cho, Anyang, all of Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 128,657, Sep. 30, 1993, abandoned. This application May 22, 1995, Ser. No. 446,287

Claims priority, application Rep. of Korea, Oct. 1, 1992, 92-18009

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—359 **3 Claims**

1. A white acrylic staple fiber which is prepared by a simple extrusion of a gel crystal formed from a PAN/H_2O mixture without spinning, consisting of fibrils which are extended and uniformly gathered in parallel with each other, and said fiber having the following properties: a degree of orientation observed by X-ray diffraction of 80–97%; a length of 5–500 mm; a thickness of 5–500 μm; a length to thickness ratio of 100–100,000 determined by a scanning electromicroscope; a tensile strength of 10–70 kg/mm^2; an initial tensile modulus of 300–1,500 kg/mm^2; an elongation of 5–20%; and a specific surface area of 1–50 m^2/g.

5,589,265

AROMATIC POLYAMIDE STAPLE FIBER BUNDLES OF IMPROVED DISPERSIBILITY IN VISCOUS MATRICES AND PRODUCTION OF FIBER-REINFORCED COMPOSITES

Richard Neuert, Winkelhaid, and Gerhard Stein, Kelheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jan. 13, 1995, Ser. No. 372,366

Claims priority, application Germany, Jan. 18, 1994, 44 01 233.0

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—361 **12 Claims**

1. A staple fiber bundle comprising aromatic polyamide staple fibers having a staple length of at least 1 mm, wherein the staple fibers have been treated with an effective amount of an agent which enhances the cohesion of the fiber bundle, and wherein the fiber bundle cohesion enhancing agent is a modified cellulose derivative, a water-soluble alkali metal silicate, a water-soluble polymer, a tallow fat derivative, a polyurethane resin, or an organosilane adhesion promoter of the formula

$$X-(CH_2)_n-Si(Y)_3$$

herein n is a number from 1 to 5, X is —COOR[1] or —CN, Y is alkyl, alkoxy, or halogen, and R[1] is alkyl, cycloalkyl, aryl, or aralkyl.

5,589,266

Patent Not Issued For This Number

5,589,267

POLYVINYL ETHER ENCAPSULATED PARTICLES

Francois Delwel, Dordrecht, Netherlands, and David J. Lang, Ossining, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 239,663, May 9, 1994, Pat. No. 5,460,743. This application Jul. 17, 1995, Ser. No. 459,915

Int. Cl.[6] B32B *5/16;* **C11D** *7/54;* **A62D** *3/00*

U.S. Cl. 428—407 **15 Claims**

1. A encapsulated particle for use in liquid cleaning compositions comprising:

a. 20–90% by weight of a continuous coating blend comprised of

i. 70 wt. % to 1 wt. % of a polyvinyl ether material having a formula

$$[C_xH_{2x}O]_y \qquad (I)$$

wherein x is an integer from 18–22 and y is an integer from 150–300; and

ii. 30% to 99% of a paraffin wax having a melting point range of from about 30° C. to about 60° C.

wherein the coating blend has a viscosity of less than about 200 centipoises as measured by a cone and plate rheometer at 80° C., a melting point range of about 40° C. to about 50° C. and a solids content of from about 35 to 100% at 40° C. and from about 0 to about 15% at 50° C.; and

b. 10 to 80% by weight of a core particle or an aggregate of core particles which are water soluble or water dispersible, or which dissolve, disperse or melt in a temperature range of from about 40° C. to about 50° C.

wherein the particle is stable in an alkaline environment and exhibits a volume % compressibility of 20 or less at 30° C.

5,589,268

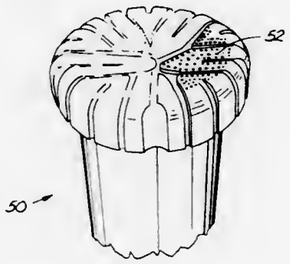
MATRIX FOR A HARD COMPOSITE

Harold E. Kelley, Fallon, Nev.; William E. Silvis, Austin, Tex., and Charles J. Terry, Fallon, Nev., assignors to Kennametal Inc., Latrobe, Pa.

Filed Feb. 1, 1995, Ser. No. 382,468

Int. Cl.[6] C22C *1/05;26/00*

U.S. Cl. 428—408 **13 Claims**



1. A diamond composite member comprising:

a support;

a diamond composite affixed to the support;

the diamond composite including a matrix comprising a mass of particles held together by an infiltrant, the mass of particles is formed by heating a powder mixture in the presence of an infiltrant wherein the powder mixture comprises: about 100 weight percent crushed sintered cemented macrocrystalline tungsten carbide particles having a particle size of −120 +400 mesh; and the composition of the crushed sintered cemented macrocrystalline tungsten carbide comprising between about 6 weight percent and about 13 weight percent cobalt and between about 87 weight percent and about 94 weight percent tungsten carbide.

5,589,269

INK RECEPTIVE SHEET

Mahfuza B. Ali, Mendota Heights; Omar Farooq, Woodbury, both of Minn.; Mohammed Iqbal, and Alan G. Miller, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

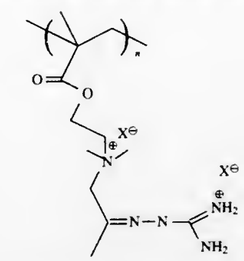
Continuation-in-part of Ser. No. 204,354, Mar. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 30,811, Mar. 12, 1993, Pat. No. 5,342,688. This application Apr. 25, 1995, Ser. No. 428,276

Int. Cl.[6] B41M *5/00*

U.S. Cl. 428—411.1 **10 Claims**

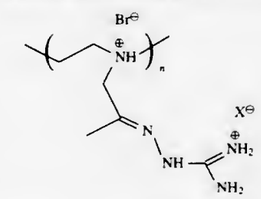
1. An ink-receptive sheet comprising a substrate bearing on at least one major surface thereof, an ink-receptive layer comprising an ink receptive polymer and an effective amount of at least one polymeric mordant comprising a guanidine functionality, said mordant being selected from the group consisting of:

a) a mordant having the following general structure:



wherein X^- is an anion, and n represents an integer of 2 or greater; and

b) a mordant having the following general structure:



wherein X^- is an anion, and n represents an integer of 2 or greater.

5,589,270

PROCESSED SUBSTRATE OBTAINED BY A PROCESS FOR EFFECTING SUPPRESSION OF ELECTRIFICATION

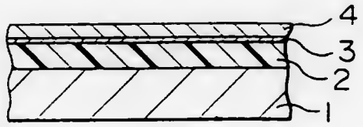
Fumio Murai, Tokyo; Yasunori Suzuki, Hachioji; Hideki Tomozawa, Tokyo; Ryuma Takashi, Tokyo; Yoshihiro Saida, Tokyo, and Yoshiaki Ikenoue, Tokyo, all of Japan, assignors to Hitachi, Ltd., and Showa Denko K.K., both of Tokyo, Japan

Continuation of Ser. No. 51,841, Apr. 26, 1993, Pat. No. 5,437,893, which is a continuation of Ser. No. 707,819, May 30, 1991, Pat. No. 5,256,454. This application Jun. 1, 1995, Ser. No. 456,313

Claims priority, application Japan, May 30, 1990, 2-138467

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—411.1 **14 Claims**



1. A method for suppression of electrification which comprises a step of forming on a substrate a water-soluble electrification-suppressing film having an electron conductivity and comprising a polymer resin and a step of irradiating a charged particle beam onto the substrate.

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5,589,271

FLUORINE COMPOUND - CONTAINING COMPOSITE MATERIAL AND METHOD OF PREPARING SAME

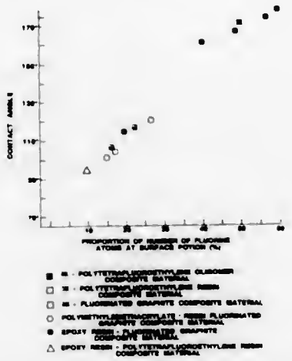
Nobuatsu Watanabe, 136, Uguisudai, Nagaokakyo-shi, Kyoto; Yong-Bo Chong, #60, Nishijin Ground Heights, 394-1, Jyuyonken-sho, Demizukudaru, Senbon-dori, Kamigyo-ku, Kyoto-shi, Kyoto, and Sowjun Matsumura, Toyonaka, all of Japan, assignors to Nobuatsu Watanabe; Yong-Bo Chong, both of Kyoto, and C. Uyemura & Co., Osaka, all of Japan

Continuation-in-part of Ser. No. 850,427, Mar. 12, 1992, abandoned. This application Apr. 23, 1993, Ser. No. 51,701

Claims priority, application Japan, Mar. 12, 1991, 3-72444; Mar. 12, 1991, 3-72445

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—421 **18 Claims**



1. A fluorine compound-containing composite material having a contact angle of 150° or more at the surface consisting essentially of a metal matrix and particles or fibers of a polytetrafluoroethylene oligomer having a number average molecular weight of 10,000 or less dispersed therein, the proportion of the number of fluorine atoms to the number of the total atoms at the surface portion of the composite material being 40% or more, wherein the surface portion is that portion of the composite material which extends from about 20 to about 40 Å into the composite material from the surface of the composite material.

5,589,272

GLAZING

Rüdiger Braun, Friedrichshafen; Manfred Arnold, Meckenbeuren; Thomas Meisel; Werner Scherber, both of Bermatingen; Günther Abersfelder, Sindelfingen, and Stefan Uhl, Stuttgart, all of Germany, assignors to Dornier GmbH, Friedrichshafen, Germany

Filed Feb. 27, 1995, Ser. No. 394,350

Claims priority, application Germany, Feb. 25, 1994, 44 06 097.1

Int. Cl.[6] B32B *17/06;17/10;27/36*

U.S. Cl. 428—425.6 **15 Claims**

1. A transparent glass/plastic material composite pane, comprising at least one transparent plastic pane, at least one glass pane and an adhesion-promoting intermediate layer between the glass pane and the plastic pane, wherein the glass pane is a glass film of a layer thickness of from 300 to 700 μm, and the adhesion-promoting intermediate layer is elastic to thereby equalize different thermal expansions of the plastic pane and the glass pane.

5,589,273

PROCESS AND AGENT FOR THE PRODUCTION OF PURPLE DECORATION

Bernd Dorbath, Alzenau; Norbert Giesecke, Bruchköbel, and Klaus-Dieter Fritsche, Colditz, all of Germany, assignors to Cerdec Aktiengesellschaft Keramische Farben, Frankfurt am Main, Germany

Filed Mar. 29, 1995, Ser. No. 412,888

Claims priority, application Germany, Mar. 30, 1994, 44 11 103.7

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—433 **34 Claims**

1. A process for the production of purple decoration on a stovable substrate which comprises applying an agent containing at least one gold compound and a finely divided glass flux onto a substrate to be decorated and firing the resultant substrate at a temperature of 400° to 1,050° C.,

wherein

the agent to be applied contains at least one gold compound, with the exception of gold oxide, which is decomposed to colloidal gold on firing, and the weight ratio of gold in the gold compound to the glass flux is between 1:10 and 1:2,000.

5,589,274

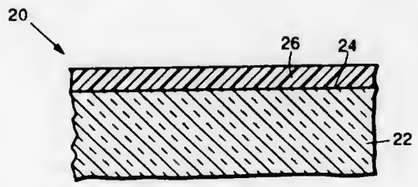
THERMAL CONTROL COATING

Lyon E. Long, Manhattan Beach, and Joan L. Lum, Redondo Beach, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed May 13, 1994, Ser. No. 242,201

Int. Cl.[6] B32B *7/02;5/16;15/08*

U.S. Cl. 428—215 **18 Claims**



1. A coated article, consisting essentially of:

a substrate having a surface; and

a single-layer coating on the surface of the substrate, the coating being sufficiently electrically conductive to dissipate electrostatic charge and having a white color, the coating comprising a silicone polymeric matrix having doped zinc oxide pigment particles distributed therein, the zinc oxide pigment particles being doped with an element that forms shallow donorlike states in the zinc oxide.

5,589,275

COMPOSITE MATERIAL

Hans P. Breitler, Kreuzlingen, Switzerland; Klaus Sommerer, Allensbach, Germany, and Monique Roulin, Aesch, Switzerland, assignors to Alusuisse-Lonza Services AG, Switzerland

PCT No. PCT/CH94/00035, § 371 Date Oct. 5, 1994, § 102(e) Date Oct. 5, 1994, PCT Pub. No. WO94/19184, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 17, 1994, Ser. No. 318,643

Claims priority, application Switzerland, Feb. 25, 1993, 576/93

Int. Cl.[6] B32B *15/08*

U.S. Cl. 428—458 **9 Claims**

1. A blister pack base part for use in freeze drying applications for foodstuffs and pharmaceuticals, comprising:

a composite material forming said base, wherein said composite material includes a metal layer with two sides and a plastic layer on each of said two sides, said metal layer having a thickness of 8 to 80 μm and said plastic layer on each of said sides having a thickness of 20 to 50 μm and containing polyamide-based thermoplastics; and

a plurality of compartments formed in said composite material for receiving at least one of said pharmaceuticals and foodstuffs.

5,589,276

THERMALLY TRANSFERABLE PRINTING RIBBONS AND METHODS OF MAKING SAME

Josepb D. Roth, Springboro; Thomas J. Obringer, Vandalia, and Monica N. Lewis, Fairborn, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1993, Ser. No. 169,935

Int. Cl.[6] B41M *3/12*

U.S. Cl. 428—488.1 **12 Claims**

1. A method of making thermally transferable printing ribbons, comprising the steps of:

mixing at least one wax, at least one resin and pigments together to form a mixture of solids;

grinding said mixture of solids to form a resultant mixture;

emulsifying said resultant mixture to form an emulsified thermally transferable printing media layer formulation; and

coating said emulsified thermally transferable printing media layer formulation onto an elongated backing element in a single layer to form said thermally transferable printing ribbons.

8. A thermally transferable printing ribbon fabricated using the method of making thermally transferable printing ribbons in accordance with claim 1.

5,589,277

RECORDING SHEETS CONTAINING AMINO ACIDS, HYDROXY ACIDS, AND POLYCARBOXYL COMPOUNDS

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 15, 1994, Ser. No. 196,679

Int. Cl.[6] B41M *5/00*

U.S. Cl. 428—500 **36 Claims**

1. A recording sheet for receiving printed images which consists essentially of a substrate selected from the group consisting of paper and transparent film and a coating situated on at least one surface of the substrate, said coating consisting essentially of (a) an additive material selected from the group consisting of monomeric amino acids, monomeric hydroxy acids, and mixtures thereof; (b) a quaternary acrylic copolymer latex binder;. (c) an optional antistatic agent; (d) an optional biocide; and (e) an optional filler.

5,589,278

MAGNETORESISTIVE THIN-FILM AND DEVICE

Atsushi Kamijo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 5, 1995, Ser. No. 498,389

Claims priority, application Japan, Jul. 5, 1994, 6-1583188

Int. Cl.[6] G11B *5/66*

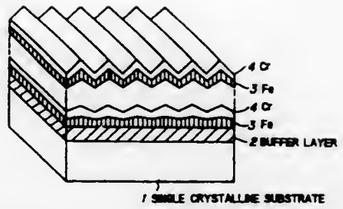
U.S. Cl. 428—611 **8 Claims**

1. A magnetoresistive thin-film, comprising:

a substrate;

an (110) oriented epitaxial buffer layer which is formed on said substrate, said buffer layer being made of a body-centered cubic crystalline metal or alloy in which a (110) face is epitaxially grown; and

a (110) orientation Fe/Cr superlattice film which is formed on said buffer layer, a Fe (110) face and a Cr (110) face of said superlattice film alternately being epitaxially grown;



wherein said superlattice film has a structure in which a plurality of staircase facets which have <100> direction ridge lines and {100} side surfaces stand side by side;

wherein said staircase facets of said superlattice film have <110> direction widths of 5 to 30 nm at a top surface thereof; and

wherein a dispersion of said 110 direction widths is within ±50%.

5,589,279

WELDABLE BLACK STEEL SHEET

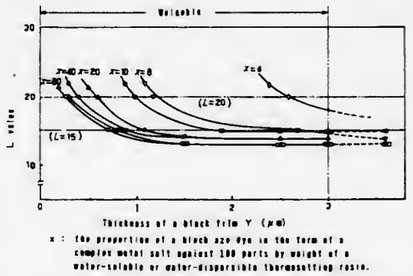
Naoto Yoshimi; Toyofumi Watanabe, and Masaaki Yamashita, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation of Ser. No. 856,245, Mar. 25, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 290,675

Claims priority, application Japan, Mar. 29, 1991, 3-089148

Int. Cl.[6] B32B *15/08*

U.S. Cl. 428—623 **10 Claims**



1. A weldable black steel sheet having a surface plated with zinc or zinc alloy, and carrying a chromate film formed on said plated surface and having a coating weight of 10 to 200 mg/m^2 in terms of metallic chromium, and a black film formed on said chromate film from a composition comprising 100 parts by weight of a water-soluble or water-dispersible thermosetting resin as a base resin, and 'x' parts by weight of a black metal complex of azo dye having at least one hydroxyl group per molecule as a blackening agent, said black film having a thickness of 'y' microns, and 'x' being a value satisfying formulas 1 and 2, while said 'y' is a vlaue satisfying formulas 1 and 3:

$$(x-1)(y-0.2) \geqq 7 \quad (1)$$

$$1 < x \leqq 200 \quad (2)$$

$$0.2 < y \leqq 3 \quad (3)$$

where 'x' represents the proportion, in parts by weight, of said dye aganinst 100 parts by weight of said resin, and 'y' represents the thickness, in microns, of said black film.

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5,589,280

METAL ON PLASTIC FILMS WITH ADHESION-PROMOTING LAYER

Kevin P. Gibbons, Sunnyvale; Louis C. Lau, Alameda, and Floyd E. Woodard, Los Altos, all of Calif., assignors to Southwall Technologies Inc., Palo Alto, Calif.

Filed Feb. 5, 1993, Ser. No. 14,447

Int. Cl.[6] C23C *14/00;* **G02B** *1/10;* **B32B** *15/08;9/00*

U.S. Cl. 428—626 **16 Claims**

1. A metal-on-plastic material comprising

a plastic substrate having a surface,

a 3 to 200 Å thick, substantially transparent first layer sputter-deposited upon the surface of the substrate comprising metal selected from the group consisting of hafnium, zirconium, tantalum, titanium, niobium, tungsten, vanadium, molybdenum, chromium, nickel and alloys thereof, the metal in said first layer being deposited in the form of metal or substoichiometric oxide, and

a second layer sputter-deposited upon the first layer comprising 100–10,000 Å of metal selected frown the group consisting of copper, silver, gold, palladium, rhodium, iridium and alloys thereof.

5,589,281

STABILIZED CARBON CLUSTER CONDUCTING OR SUPERCONDUCTING MATERIAL, PROCESS FOR PRODUCING THE SAME, DEVICE USING CARBON CLUSTER, AND PROCESS FOR PRODUCING THE DEVICE

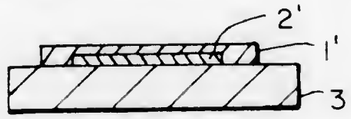
Nobuyuki Okuda; Takashi Uemura; Yoshinobu Ueba; Koji Tada; Kengo Ohkura, and Hirokazu Kugai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 51,345, Apr. 23, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,043

Claims priority, application Japan, May 20, 1992, 4-127027; Aug. 19, 1992, 4-220407; Mar. 4, 1993, 5-043730

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—688 **3 Claims**



1. A device comprising a substrate having thereon, (1) a film of a conducting or superconducting carbon cluster comprising (a) C_{60} or (b) a C_{60}/C_{70} mixture, each of (a) and (b) being doped with at least one dopant selected from the group consisting of Group I elements, Group II elements, Group III elements, and Group IV elements, covered with (2) a protective film capable of substantially preventing permeation of oxygen and water from the atmosphere,

wherein said protective film (2) comprises an insulator having a thermal expansion coefficient ranging from 1×10^{-6}/°C. to 5×10^{-6}/°C.,

wherein said device further comprises (3) a non-doped carbon cluster film between said film (1) and said protective film (2),

wherein said insulator is selected from the group consisting of silicon, silicon dioxide, silicon nitride, diamond, amorphous carbon, and boron nitride, and

wherein said protective film (2) has a thickness of from 0.1 μm to 10 μm.

5,589,282

MAGNETO-OPTICAL RECORDING MEDIUM

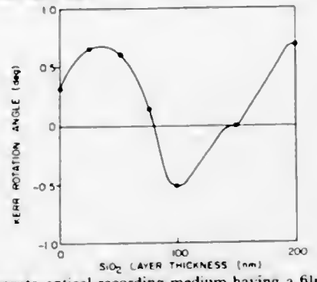
Masayuki Kubogata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 21, 1994, Ser. No. 278,225

Claims priority, application Japan, Jul. 22, 1993, 5-181472

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—694 ML **14 Claims**



1. A magneto-optical recording medium having a film of amorphous rare earth-transition metal alloy as a recording layer, comprising:

a substrate;

a first dielectric layer;

a recording layer;

a second dielectric layer; and

a reflective layer, laminated in this order, wherein a total film thickness of said recording layer is 40 nm or more and less than 80 nm, wherein a thickness of said second dielectric layer is greater than a thickness of said first dielectric layer, and wherein the thickness of said second dielectric layer and the thickness of said first dielectric layer maximize a product of a Kerr rotation angle and a reflectivity of said medium.

5,589,283

SOFT MAGNETIC THIN FILM

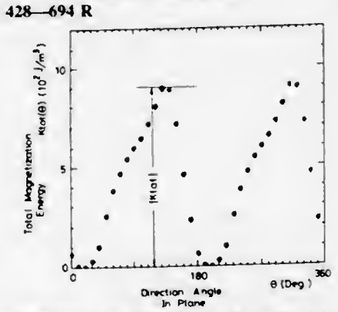
Yoh Iwasaki; Yosuke Murakami, and Masao Itabashi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 22,499, Feb. 25, 1993, abandoned. This application Nov. 3, 1994, Ser. No. 334,353

Claims priority, application Japan, Feb. 29, 1992, 4-079289; Nov. 30, 1992, 4-320988

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—694 R **7 Claims**



1. A soft magnetic thin film which satisfies the following relationship:

where the magnetization energy required to magnetize the soft magnetic thin film in any direction in the plane thereof is referred to as total magnetization energy, |Ktot| is the difference between the maximum and minimum values of the total magnetization energy in every direction in the plane, and |Kc| is the difference between the maximum and minimum values of the magnetization energy in every direction in the plane due to crystalline magnetic anisotropy, wherein the total magnetic anisotropy energy value |Ktot| and the crystalline magnetic anisotropy energy value |Kc| is selected to satisfy the following relationship:

$$|Ktot|<50<|Kc|(J/m^3)$$

wherein the soft magnetic thin film is made of an FeRuGaSi alloy, and wherein the total Fe and Ru in the FeRuGaSi alloy is of at least 75 atomic %.

5,589,284

ELECTRODES COMPRISING CONDUCTIVE PEROVSKITE-SEED LAYERS FOR PEROVSKITE DIELECTRICS

Scott R. Summerfelt, and Howard R. Beratan, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 283,468, Aug. 1, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 474,803

Int. Cl.[6] B32B *18/00*

U.S. Cl. 428—697 **13 Claims**

30

1. A microelectronic structure comprising:

a conductive oxide layer comprising a first metal;

a conductive perovskite-seed layer comprising said first metal overlying said conductive oxide layer; and

a perovskite dielectric layer overlying said perovskite-seed layer, whereby the similar crystal structure of the perovskite-seed layer improves the crystal quality of the perovskite dielectric layer and minimizes the formation of non-perovskite crystal structures.

5,589,285

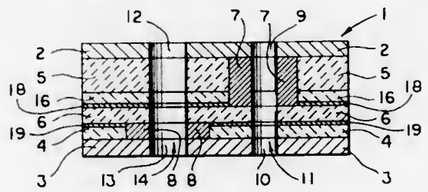
ELECTROCHEMICAL APPARATUS AND PROCESS

Thomas L. Cable, Newbury, and Michael A. Petrik, Highland Hts., both of Ohio, assignors to Technology Management, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 118,524, Sep. 9, 1993, Pat. No. 5,445,903. This application May 31, 1995, Ser. No. 455,099

Int. Cl.[6] H01M *8/00*

U.S. Cl. 429—13 **41 Claims**



26. A process for utilizing a sulfur bearing fuel in an electrochemical apparatus including:

providing a fuel cell having an electrolyte disposed between a fuel electrode and a second electrode, wherein a fuel electrode material interfacial layer is further disposed between the electrolyte and the fuel electrode, and wherein at least one of the interfacial layer and the fuel electrode comprises at least one sulfur tolerant material;

introducing a fuel containing at least about 2 ppm sulfur species, at reaction temperature, into said fuel cell; and,

reacting said fuel.

5,589,286

SOLID ELECTROLYTE FUEL CELL

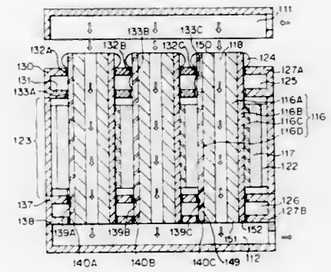
Tomoo Iwata, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1994, Ser. No. 278,070

Claims priority, application Japan, Jul. 21, 1993, 5-179486

Int. Cl.[6] H01M *8/24;8/12*

U.S. Cl. 429—34 **37 Claims**



1. A planar solid electrolyte fuel cell comprising:

a stack casing having a stack reaction chamber therein;

a plurality of vertically oriented electrode/solid electrolyte/separator assemblies arranged in a parallel orientation in the stack reaction chamber of said stack casing, each of said assemblies comprising:

a cell substrate serving as a first electrode, said cell substrate being a flat box with first and second, oppositely located vertical main surfaces during operation of the fuel cell, and including a plurality of reaction gas flow ports located therein, said gas flow ports being parallel to the main surfaces, and feeding a first reactant gas in a uniform direction,

a solid electrolyte provided on the first main surface of said cell substrate,

a second electrode provided on said solid electrolyte, and

a separator provided on the second main surface of said cell substrate; and

an electroconductive felt interposed between adjacent ones of said assemblies, said electroconductive felt having a plurality of cavities through which a second gas flows.

5,589,287

MOLTEN CARBONATE FUEL CELL

Kazubito Hatoh, Daitou; Junji Niikura, Hirakata; Eiichi Yasumoto, Katano, and Takaharu Gamou, Fujiidera, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 5, 1994, Ser. No. 318,916

Claims priority, application Japan, Oct. 18, 1993, 5-260125; Feb. 9, 1994, 6-015524

Int. Cl.[6] H01M *8/14*

U.S. Cl. 429—41 **6 Claims**

1. A molten carbonate fuel cell comprising:

an anode and a cathode which are both porous gas-diffusion electrodes, and

an electrolyte making contact with both the electrodes, wherein

said cathode comprises a metal oxide represented by the formula $Li_xNi_{1-x}O$ ($0.05\leq x<0.5$), and

at least one of said cathode and electrolyte contains an alkaline earth metal carbonate.

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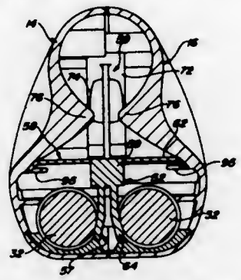
5,589,288

CORDLESS POWER TOOL HAVING A PUSH BUTTON BATTERY RELEASE ARRANGEMENT

Richard R. Coulson, Toronto; Eric D'amario, Woodbridge, and Jerry Moscovitch, Toronto, all of Canada, assignors to Black & Decker, Inc., Newark, Del.

Filed Jul. 31, 1995, Ser. No. 509,076
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—96 **18 Claims**



1. A battery pack release arrangement for a power tool having a housing and at least one battery pack releaseably mounted within the housing, the release arrangement comprising:

an actuation member for releasably latching the at least one battery pack in an operative position, said actuation member being moveable between a latching position and a release position, said actuation member integrally formed to include a button portion and a latching portion, said latching portion adapted to be in interfering relation with the at least one battery pack when said actuation member is in said latching position; and

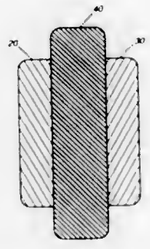
a camming portion disposed adjacent to said latching portion of said actuation member, said camming portion adapted to resiliently deflect said engaging portion out interfering relation with the at least one battery pack when said actuation member is moved from said latching position to said release position.

5,589,289

CARBON ELECTRODE MATERIALS FOR ELECTROCHEMICAL CELLS AND METHOD OF MAKING SAME

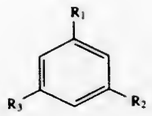
Jinshan Zhang, Duluth, and Anaba A. Anani, Norcross, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 27, 1995, Ser. No. 534,427
Int. Cl.[6] H01M *6/00*
U.S. Cl. 429—122 **4 Claims**



1. A rechargeable electrochemical cell comprising:

a lithium intercalation cathode; an electrolyte; and an anode fabricated of an amorphous carbon material resulting from the condensation and reduction of a multi-functional organic monomer having the structure:



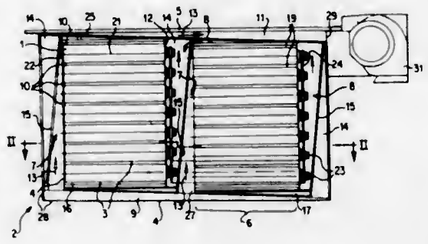
wherein R_1, R_2, and R_3 are all selected from the group consisting of carboxylic acids of eight carbons or less, carboxylic esters of eight carbons or less, alcohols of eight carbons or less, carboxylic anhydrides of eight carbons or less, amines, and combinations thereof, and wherein at least one of R_1, R_2, and R_3 is different than the others.

5,589,290

BATTERY BOX WITH FLUID FLOW CHANNELS TO MAINTAIN PROPER TEMPERATURE

Rainer Klink, Kernen; Johann German, and Wolfgang Warthmann, both of Weinstadt, all of Germany, assignors to Deutsche Automobilgesellschaft mbH, Germany

Filed Mar. 6, 1995, Ser. No. 400,105
Claims priority, application Germany, Mar. 4, 1994, 44 07 156.6
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—99 **11 Claims**



1. A battery box having a plurality of orientation independent electrochemical cells, of the type in which said cells are arranged into at least one cell group, with flow channels formed between adjacent cells within said cell groups, through which a fluid can flow, a distributor channel being arranged in a first region of said box and coupled in fluid communication with said fluid flow channels at an inlet end thereof, and a collector channel being arranged in a second region of said box opposite said first region and coupled in fluid communication at an outlet end thereof, wherein:

in an installed orientation of said battery box, said cells are arranged in a horizontal orientation having the smallest dimension thereof in a vertical direction;

cells within a cell group are stacked one above the other;

each cell group has associated therewith inlet and outlet flow channels which extend transversely with respect to said battery box;

the transverse inlet flow channel is connected in fluid communication with the distributor channel and to the flow channels of a cell group associated therewith; and

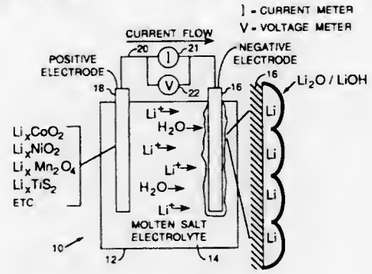
the transverse outlet flow channel being connected in fluid communication with the collecting channels and the flow channels of an associated cell group.

5,589,291

STABILIZED RECHARGEABLE CELL IN MSE

Richard T. Carlin, Colorado Springs, Colo., and Joan Fuller, Raleigh, N.C., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 494,425, Jun. 26, 1995. This application Feb. 22, 1996, Ser. No. 613,746
Int. Cl.[6] H01M *10/36*
U.S. Cl. 429—103 **5 Claims**



1. A stabilized rechargeable cell comprising.

a) an MSE melt of $LiBF_4/EMIBF_4$

b) a lithium metal negative electrode and

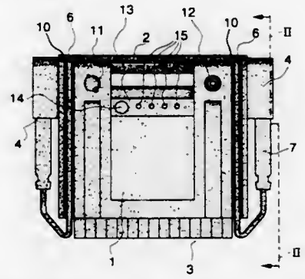
c) a lithium salt protective film deposited on the lithium metal surface of said electrode, which film is permeable to Li^+ ions.

5,589,292

PORTABLE BOOSTER BATTERY

Luc Rozon, St-Luc, Canada, assignor to Booster Pac International Corporation, St-Jean-sur-Richelieu, Canada

Filed Aug. 9, 1994, Ser. No. 287,840
Claims priority, application Canada, Oct. 25, 1993, 2109166
Int. Cl.[6] H01M *2/06*
U.S. Cl. 429—170 **20 Claims**



1. A portable automobile booster battery comprising:

a sealed non-spillable battery having a positive terminal and a negative terminal;

a housing surrounding said battery and covering said terminals of said battery;

a first cable with one end permanently connected to said positive terminal of said battery, said first cable extending outside said housing;

a second cable with one end permanently connected to said negative terminal of said battery, said second cable extending outside said housing;

first clamp means connected to another end of said first cable and for electrically connecting said first cable to a positive terminal of an automobile battery;

second clamp means connected to another end of said second cable and for electrically connecting said second cable to one of a negative terminal of said automobile battery and a ground of an automobile;

a first holster means connected to an outside of said housing, and for holding said first clamp means outside of said housing;

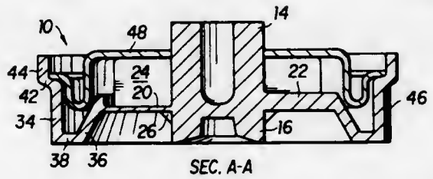
a second holster means connected to an outside of said housing, and for holding said second clamp mean outside said housing.

5,589,293

SEALED GALVANIC CELL WITH INJECTION MOLDED TOP

Peter J. Pope, Balcumbe, and Richard B. Willis-Owen, West Sussex, both of Great Britain, assignors to Duracell Inc., Bethel, Conn.

PCT No. PCT/US89/01365, § 371 Date Dec. 14, 1990, § 102(e) Date Dec. 14, 1990, PCT Pub. No. WO89/11164, PCT Pub. Date Nov. 16, 1989
PCT Filed Mar. 31, 1989, Ser. No. 623,701
Claims priority, application United Kingdom, May 5, 1988, 8810651
Int. Cl.[6] H01M *2/08*
U.S. Cl. 429—172 **7 Claims**



1. A top for sealing and insulating the open end of a cylindrical container subject to internal pressure variations, said top comprising means to support the top and a sealing and insulating member, said sealing and insulating member comprising a central platform having an axially extending boss, with said platform having a plurality of vent membranes integrally formed therein, wherein each vent is designed to vent at approximately the same pressure, said membranes in combination comprising between at least about 30% of the surface area of said platform exclusive of said boss portion, and means to strengthen the top, wherein said platform is disc shaped and said vent membranes comprise up to about 50% of the platform surface area and are equidistantly spaced around the surface of said disc and are separated from each other by thicker, non-venting portions of said platform, wherein said means to strengthen the top comprises vertically extending stiffening ribs which extend radially from the central boss member, and each rib being integral with the upper surface of the platform at the juncture of a vent membrane and an adjacent non-venting portion thereof, and wherein said sealing and insulating member further comprises a downwardly depending frustoconical member attached to the outer circumference of the platform; an annular bottom member attached at its inner circumference to the lower end of the frustoconical member; and an upwardly extending outer wall attached to the outer circumference of the annular bottom member.

5,589,294

SIDE WALL ELECTRICITY BATTERY TERMINAL

Bernard N. Spiegelberg, Germantown, and Mark E. Sauter, Shorewood, both of Wis., assignors to Tulip Corporation, Milwaukee, Wis.

Continuation of Ser. No. 199,100, Feb. 22, 1994, Pat. No. 5,425,170, which is a division of Ser. No. 79,153, Jun. 17, 1993, Pat. No. 5,422,202. This application Jun. 2, 1995, Ser. No. 459,783
Int. Cl.[6] H01M *2/30*
U.S. Cl. 429—178 **2 Claims**

1. A cold formed side wall battery terminal comprising a cylindrical lead slug having a cavity at one end, a nut positioned in said cavity, a spline ring formed around the other end of the slug and a set of rings formed around the perimeter of said slug to seal the

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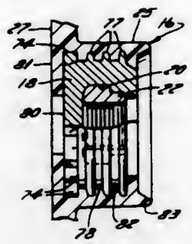


terminal in the side wall of the battery wherein said nut is encapsulated in said terminal when said slug is cold formed to shape the terminal.

5,589,295

THIN FILM POLYMERIC GEL ELECTROLYTES

Dora K. Derzon, 1554 Rosalba St. NE., Albuquerque, Bernalillo County, N.M. 87112; Charles Arnold, Jr., 3436 Tahoe, NE., Albuquerque, Bernalillo County, N.M. 87111, and Frank M. Delnick, 9700 Fleming Rd., Dexter, Mich. 48130

Filed Dec. 6, 1995, Ser. No. 568,029

Int. Cl.[6] H01M *10/08*

U.S. Cl. 429—190 **6 Claims**

1. A hybrid thin film electrolyte, comprising: in combination, a polymer capable of forming a gel, said polymer gel having a solution retained therein, said solution comprising ethylene carbonate, at least one organonitrile and at least one lithium salt having a polarizable anion and capable of dissolving in said solution.

5,589,296

FIBROUS SOLID ELECTROLYTE, CELL USING THE ELECTROLYTE AND PROCESS FOR PRODUCING THE ELECTROLYTE

Kazuya Iwamoto, Sakai; Noboru Aotani, Uji; Kazunori Takada, Osaka, and Shigeo Kondo, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 3, 1994, Ser. No. 205,109

Claims priority, application Japan, Mar. 22, 1993, 5-061640

Int. Cl.[6] H01M *6/18*

U.S. Cl. 429—191 **28 Claims**

1. A fibrous solid electrolyte for use in solid electro-chemical elements, which comprises a fibrous ion conductive glassy solid electrolyte, whose ion conductive species is selected from the group consisting of copper and proton.

5,589,297

LITHIUM SECONDARY CELL

Keiji Koga; Hitoshi Arai; Tsuneo Kagotani, and Yousuke Miyaki, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 29, 1994, Ser. No. 365,745

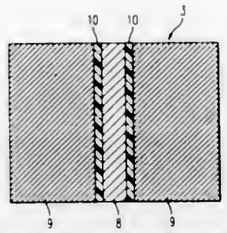
Claims priority, application Japan, Dec. 29, 1993, 5-353671; Dec. 29, 1993, 5-353672

Int. Cl.[6] H01M *4/36*

U.S. Cl. 429—212 **10 Claims**

1. A secondary lithium cell comprising a negative electrode, a positive electrode and an electrolyte of a non-aqueous electrolyte solution containing a lithium salt, wherein

at least one of said negative electrode and said positive electrode includes an electrode layer disposed on a current collector through an underlying layer, and



said underlying layer being formed of a composition comprising from 10 to 200 parts by weight of carbon black having a DBP oil absorption of 100 to 500 cc/100 g, 100 parts by weight of a thermosetting polymer containing a fluorinated polymer and from 1 to 10 parts by weight of a crosslinking agent, said composition being a thermoset.

5,589,298

ELECTROCHEMICAL DEVICES COMPRISING LITHIUM NITRIDE-METAL COMPOUNDS IN AT LEAST ONE OF A PAIR OF ELECTRODES

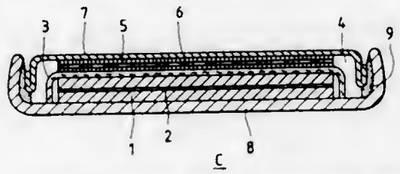
Kazunori Takada, Osaka; Shigeo Kondo, Hirakata; Osamu Yamamoto, Ichinomiya, and Motoaki Nishijima, Mie-ken, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 8, 1994, Ser. No. 302,300

Claims priority, application Japan, Sep. 9, 1993, 5-224281

Int. Cl.[6] H01M *4/02*

U.S. Cl. 429—218 **66 Claims**



1. A lithium secondary cell which comprises a cell unit including a pair of electrodes, a separator provided between said pair of electrodes, and a liquid electrolyte impregnated in said separator and capable of lithium ion concentration, wherein at least one of said pair of electrodes comprises a lithium nitride-metal compound which contains at least one metal selected from the group consisting of Co, Cu, Cr, V, Sr, Ni, W and Nb.

5,589,299

CARBON ELECTRODE FOR NONAQUEOUS SECONDARY BATTERY, FABRICATION METHOD FOR THE SAME AND NONAQUEOUS SECONDARY BATTERY USING THE SAME

Kazuo Yamada, Kitakatsuragi-gun; Takehito Mitate, Yamato-takada; Tetsuya Yoneda, Nabari, and Naoto Nishimura, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

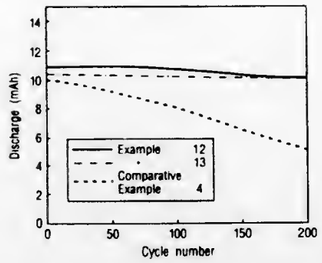
Filed Jun. 6, 1995, Ser. No. 469,906

Claims priority, application Japan, Jul. 21, 1994, 6-169333; Mar. 28, 1995, 7-070058

Int. Cl.[6] H01M *4/66*

U.S. Cl. 429—218 **10 Claims**

1. A carbon electrode for a nonaqueous secondary battery comprising a conductive substrate doubling as a collector, the conductive substrate having a portion with carbon formed directly thereon and a portion where carbon is not formed, wherein the conductive substrate comprises a metal or a compound thereof having a catalytic action with respect to graphitization of a carbon material



at the portions where carbon is formed directly thereon and comprises a metal or a compound thereof having no catalytic action with respect to graphitization of the carbon material at the portions where carbon is not formed.

5,589,300

SMALL PARTICLE ELECTRODES BY AEROSOL PROCESS

Denis G. Fauteux, Acton; Arthur A. Massucco, Natick, and Ronnie D. Wilkins, Melrose, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 126,918, Sep. 27, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 447,137

Int. Cl.[6] H01M *4/48*

U.S. Cl. 429—218 **42 Claims**

1. A method for preparing an electrode, comprising the steps of:

generating droplets of a solution of a precursor material in a carrier liquid, said precursor material capable of being converted into an active material of an electrode;

removing at least a portion of said carrier liquid from said droplet to form precursor particles;

converting said precursor particles into particles of said active electrode material, wherein parameters for the conversion of the droplet into an active electrode material are controlled to obtain a predetermined particle configuration wherein the step of generating droplets of a solution of a precursor material in a carrier liquid comprises using a carrier liquid comprising a solvent and a diluent liquid.

5,589,301

BATTERY ELECTRODE SUBSTRATES AND METHOD OF MAKING SAME

Robert J. Edgington, Granger; James A. Stepro; Harold J. Wissell, both of Mishawaka, all of Ind., and Scott A. Lundberg, Niles, Mich., assignors to National-Standard Company, Niles, Mich.

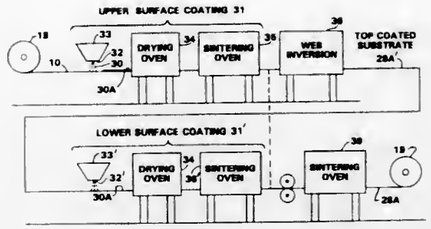
Continuation of Ser. No. 979,830, Nov. 20, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 318,489

Int. Cl.[6] H01M *4/72*

U.S. Cl. 429—234 **36 Claims**

1. A three-dimensional substrate material for use in constructing battery electrodes comprising:

a sintered matrix material selected from the group of elements consisting of reticulated metal foams, conductive fibers and



metal powder compacts, said matrix material having at least one flexible bonded open surface structure, and

a flexible open surface matrix retaining means bonded to at least one surface of said sintered matrix material, with said retaining means structurally arranged to permit loading of active chemical material through said retaining means into said sintered matrix material and to retain said sintered matrix material substantially within the formed surface of said at least one surface of said matrix material during subsequent spiral-winding of the sintered matrix material.

5,589,302

BATTERY SEPARATOR AND BATTERY CONTAINING SAME

Peter J. Degen, Huntington, and Joseph Y. Lee, South Setauket, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Nov. 4, 1994, Ser. No. 334,756

Int. Cl.[6] H01M *2/16*

U.S. Cl. 429—250 **32 Claims**

1. A battery separator comprising (a) a nonwoven web of fibers having a mean diameter of about 15 μm or less and (b) a graft polymerized monomer on the surface of said nonwoven web which renders said nonwoven web spontaneously wettable by an alkaline electrolyte, wherein said nonwoven web comprises at least about 60 wt. % of a first polyolefin having a first melting temperature and no more than about 40 wt. % of a second polyolefin having a second melting temperature which is lower than said first melting temperature, said nonwoven web has been subjected to a temperature between said first and second melting temperatures, said nonwoven web has a thickness of at least about 50 μm, and said monomer is selected from the group consisting of vinyl sulfonic acid, vinyl phosphonic acid, and acrylic and methacrylic acid monomers and hydroxyl functional derivatives thereof.

5,589,303

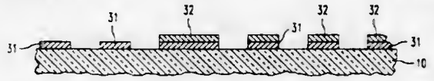
SELF-ALIGNED OPAQUE REGIONS FOR ATTENUATING PHASE-SHIFTING MASKS

John J. DeMarco, East Brunswick, N.J.; Taeho Kook, Lower Macungie Township, Lehigh County, Pa., and Robert L. Kostelak, Jr., Bernardsville, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 366,952

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—5 **18 Claims**



1. A method of making an optical lithographic mask comprising the steps of:

(a) providing a substrate having a top surface upon which is located a first layer, the first layer being partially transparent to optical radiation of a wavelength λ;

(b) depositing a second layer chemically different from the first layer on the top surface of the first layer, the second layer

being sufficiently thick so as to be, in combination with the first layer, opaque to the optical radiation of the wavelength λ;

(c) forming a first patterned resist layer on the top surface of the second layer;

(d) etching the first and second layers, using the first patterned resist layer as a protective layer against etching of the second layer and using the first patterned resist layer or the resulting patterned second material layer as a protective mask against etching the first layer, whereby a first patterned opaque layer is formed having spaced-apart areas each having a top surface bounded by at least one sidewall;

(e) forming a second patterned resist layer that coats the entire top surfaces of, and the entire spaces between, at least some, but not all, of the spaced-apart areas; and

(f) etching only the patterned second layer using the second patterned resist layer as a protective mask against etching the patterned second layer, while using exposed portions of the first patterned opaque layer as a protective mask against etching the patterned first layer, whereby a second patterned opaque layer and a patterned partially transparent layer are formed, the second patterned opaque layer having a first pattern that includes at least an alignment indicator that is self-aligned with a second pattern of the partially transparent layer.

5,589,304

PHOTOMASK COMPRISING A HOLDING FRAME AND REINFORCING MEMBER WITH A CERAMIC OXIDE BOND

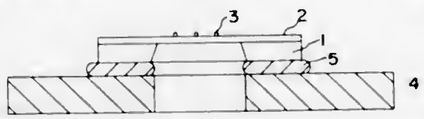
Keiko Chiba, Isehara, and Takeshi Miyachi, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1995, Ser. No. 404,959

Claims priority, application Japan, Mar. 16, 1994, 6-046219

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—5 **8 Claims**



1. A mask, comprising:

a membrane on which a pattern is formed or to be formed;

a holding frame for holding said membrane; and

a reinforcing member for reinforcing said holding frame;

wherein said reinforcing member comprises ceramics and wherein said reinforcing member and said holding frame are bonded to each other through a film oxide of the ceramics.

5,589,305

METHOD OF FABRICATING A RETICLE

Yoko Tomofuji; Makoto Nakase, both of Tokyo, Japan; Takashi Sato, Fishkill, N.Y.; Hiroaki Hazama; Haruki Komano, both of Kanagawa, Japan, and Shinichi Ito, Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 192,091, Feb. 4, 1994, abandoned, and a continuation-in-part of Ser. No. 798,721, Nov. 29, 1991, abandoned. This application May 30, 1995, Ser. No. 453,465

Claims priority, application Japan, Nov. 29, 1990, 2-331308; Jul. 3, 1991, 3-163131; Nov. 11, 1991, 3-294540; Nov. 13, 1991, 3-297461

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—5 **12 Claims**

1. A method of fabricating a reticle comprising the step of forming on a light-transmissible substrate a mask pattern of a semi-transparent film which causes length of an optical path for a light beam passing therethrough to be different from length of an optical path for a light beam passing through the light-transmissible substrate by a predetermined amount, wherein the step of forming a mask pattern comprises the steps of:

determining ranges of refractive index n and extinction coefficient k of the semi-transparent film within which transmissivity ratio T and a phase difference φ between the semi-transparent film and air that has the same thickness of the semi-transparent film fall within ranges necessary to obtain desired resolution and depth of focus;

obtaining relationship in the form of a curved line between the refractive index n and the extinction coefficient k by changing conditions for formation of the mask pattern;

selecting values of the refractive index and the extinction coefficient from the range thus determined, and determining the conditions for formation of the mask pattern such that the refractive index and the extinction coefficient become the selected values; and

forming a mask pattern based on the conditions for formation of the mask pattern.

5,589,306

PHOTOSENSITIVE RESIN COMPOSITION FOR PRODUCING A RELIEF PRINTING PLATE

Masahiko Takahashi, and Shusaku Tabata, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 641,762, Jan. 16, 1991, abandoned, which is a division of Ser. No. 326,902, Mar. 21, 1989, abandoned. This application Dec. 2, 1992, Ser. No. 985,233

Claims priority, application Japan, Mar. 26, 1988, 63-072926

Int. Cl.[6] G03C *3/00*; **G03F** *7/035*

U.S. Cl. 430—18 **2 Claims**

1. A corrugated board printing plate having a thickness of from 3 mm to 10 mm produced by a method comprising the steps of:

(a) providing a photosensitive resin layer, then in either order for exposure;

(b) subjecting one surface of said resin layer to relief exposure through a transparency having a transmitting pattern; and

(c) subjecting the other surface of said resin layer to back exposure;

(d) subjecting the resultant exposed resin layer to development to obtain a corrugated board printing plate;

(e) washing said corrugated board printing plate; and

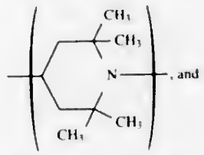
(f) drying the washed corrugated board printing plate;

wherein said photosensitive resin layer is composed of a photosensitive resin composition comprising:

(A) from 5.0 to 98.0% by weight, based on the total weight of components (A), (B), (C), and (D), of an ethylenically unsaturated polyurethane prepolymer having a number average molecular weight of 5,000 to 100,000,

(B) from 1.0 to 94.0% by weight, based on the total weight of components (A), (B), (C), and (D), of an ethylenically unsaturated monomer having a number average molecular weight of less than 2,000,

(C) from 0.05 to 10.0% by weight, based on the total weight of components (A), (B), (C), and (D), of a hindered amine having a piperidine ring represented by the formula:



(D) from 0.002 to 10.0% by weight, based on the total weight of components (A), (B), (C), and (D), of a photopolymerization initiator,

wherein at least one component selected from the group consisting of component (A) and component (B) contains in its structure a segment containing ether bonds which is represented by the formula:

$$\text{-}(R^1\text{—}O)_n\text{-} \qquad \text{(IX)}$$

wherein R^1 represents a hydrocarbon group having from 2 to 20 carbon atoms and n is an integer of 3 or more,

said segment being present in an amount of 50% by weight or more, based on the total weight of components (A) and (B), and

wherein the weight ratio of said component (A) to said component (B) is from 80.0/19.0 to 30.0/47.0.

5,589,307

PRINTING PLATE AND PROCESS FOR PREPARING THE SAME

Satoshi Takeuchi, Tokyo-to, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

Filed May 26, 1995, Ser. No. 452,060

Claims priority, application Japan, May 26, 1994, 6-136345; Aug. 11, 1994, 6-209389; Oct. 6, 1994, 6-268369

Int. Cl.[6] G03G *13/26*

U.S. Cl. 430—49 **18 Claims**

1. A process for preparing a dry lithographic printing plate, comprising the steps of:

providing an N-type photoconductor layer having an optical memory property on the surface of a substrate having an electrical conductivity at least in its surface to form an N-type photoconductor substrate;

subjecting the N-type photoconductor layer to a desired patternwise exposure by at least one of batch exposure and photodrawing exposure to render exposed areas electrically conductive;

immersing the N-type photoconductor substrate in an aqueous electrodeposition bath containing an ionic organic polymer having oil-repellent properties after electrodeposition to electrodeposit said ionic organic polymer contained in the electrodeposition bath to form an oil-repellent electrodeposit layer which is unreceptive to a printing ink; and

washing and drying the electrodeposited substrate to obtain a dry lithographic printing plate.

5,589,308

METHOD FOR PREPARATION OF PRINTING PLATE BY ELECTROPHOTOGRAPHIC PROCESS

Eiichi Kato; Makoto Momota, and Hiroyuki Ohishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1995, Ser. No. 492,701

Claims priority, application Japan, Jun. 21, 1994, 6-160779

Int. Cl.[6] G03G *13/32*

U.S. Cl. 430—49 **18 Claims**

1. A method for preparation of a printing plate by an electrophotographic process comprising forming a peelable transfer layer capable of being removed upon a chemical reaction treatment on a surface of an electrophotographic light-sensitive element, forming a toner image by an electrophotographic process on the transfer layer, heat-transferring the toner image together with the transfer layer onto a receiving material having a surface capable of providing a hydrophilic surface suitable for lithographic printing at the time of printing, and removing the transfer layer on the receiving material upon the chemical reaction treatment, wherein the transfer layer has a stratified structure composed of a first transfer layer (T_1) which is in contact with the surface of electrophotographic light-sensitive element and is formed by an electrodeposition coating method using thermoplastic resin grains (AL) each containing a resin (A_1) having a glass transition point of from 10° C. to 140° C. or a softening point of from 35° C. to 180° C. and a resin (A_2) having a glass transition point of not more than 45° C. or a softening point of not more than 60° C. wherein the glass transition point or softening point of resin (A_1) is at least 2° C. higher than that of resin (A_2) and a second transfer layer (T_2) provided thereon mainly containing a resin (A_2).

5,589,309

ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING PERYLENES

Tomoko Suzuki; Akira Kinoshita; Hirofumi Hayata, and Tomoo Sakimura, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 17, 1995, Ser. No. 503,125

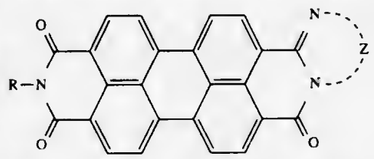
Claims priority, application Japan, Jul. 20, 1994, 6-168005

Int. Cl.[6] G03G *5/06;5/047*

U.S. Cl. 430—59 **3 Claims**

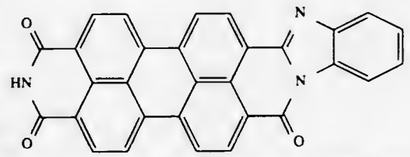
1. An electrophotographic photoreceptor comprising a conductive support and provided thereon an intermediate layer, a carrier generation layer and a carrier transportation layer containing a carrier transportation material, wherein a first perylene compound represented by Formula A and a second perylene compound represented by Formula B are mixed in said carrier generation layer:

Formula A



wherein Z represents a substituted or unsubstituted divalent aromatic hydrocarbon group or a substituted or unsubstituted divalent heterocyclic group; and R represents an alkyl group, an aralkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an aromatic hydrocarbon group or a heterocyclic group;

Formula B



and wherein a weight ratio of said first perylene compound represented by Formula A to said second perylene compound represented by Formula B is a ratio of 9/1 to 999/1.

5,589,310

METHOD FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGES

Mikio Uno; Takashi Shintaku, and Takatsugu Takehara, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 499,005

Claims priority, application Japan, Jul. 29, 1994, 6-178352

Int. Cl.[6] G03G *9/097*

U.S. Cl. 430—106 **18 Claims**

1. A method for producing a toner for developing electrostatic images, which comprises the steps of kneading a mixture of raw materials comprising at least a resin and a colorant, cooling the kneaded mixture, pulverizing the cooled mixture, classifying the pulverized mixture, and feeding a fine powder separated by the classification step to a melt of the mixture of raw materials in the middle of the kneading step.

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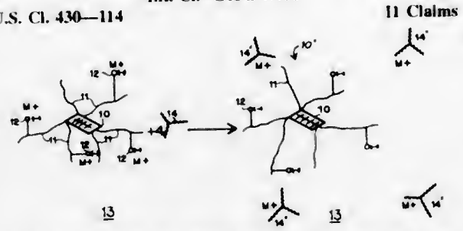
5,589,311

CAGE COMPLEXES FOR CHARGE DIRECTION IN LIQUID TONERS

Dale D. Russell, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 28, 1994, Ser. No. 345,144
Int. Cl.[6] G03G *9/135*
U.S. Cl. 430—114 **11 Claims**



1. A liquid toner for electrophotography comprising a cage complex molecule comprising at least three (3) chains or at least two (2) connected rings, the cage complex molecule having at least three electron pair donor atoms, including at least one of the said electron pair donor atoms being located in each of the chains or at least one of the said electron pair donor atoms being located in each of the connected rings, said liquid toner further comprising:

a non-polar, nonconducting liquid medium;

a toner particle comprising a pigment component and a resinous coating, the toner particle being dispersed in said liquid medium;

a weakly coordinated, negatively-charged functional group bound to said resinous coating of the toner particle, making the toner particle a negatively-charged toner particle; and

a cation dispersed in said liquid medium, said cation being selected from the group consisting of: a cationic organic ion, an ammonium ion, or an alkyl, allyl, or aryl substituted ammonium ion; and

wherein the cage complex molecule is dispersed in said liquid medium and the said cation is strongly chelated by said cage complex molecule.

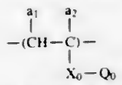
5,589,312

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Seiji Horie; Kenji Sano; Nobuo Suzuki, and Shu Wataraí, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

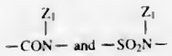
Continuation of Ser. No. 10,164, Jan. 28, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 411,079
Claims priority, application Japan, Jan. 30, 1992, 4-038404; Feb. 27, 1992, 4-075695
Int. Cl.[6] G03G *9/13*
U.S. Cl. 430—115 **6 Claims**

1. A liquid developer useful for developing a latent image having been electrophotographically formed on a printing plate precursor into a toner image during manufacture of a printing plate, said printing plate precursor comprising an electrically conductive substrate having a hydrophilic surface and a layer containing an organic photoconductive compound on said hydrophilic surface, said toner image being fixed, and a non-image area of said layer other than said toner image area being removed by etching with an alkaline etching solution to provide said printing plate, said liquid developer comprising at least resin grains dispersed in a non-aqueous solvent having a volume specific resistivity of at least 10^9 Ωcm, wherein said resin grains are obtained by polymerizing 10 to 70 mol % of (a) at least one monomer selected from the group consisting of benzyl methacrylate, benzyl acrylate, styrene and a substituted styrene monomer soluble in the non-aqueous solvent, and 30 to 90 mol % of (b) at least one monomer having an alkyl group of up to 3 carbon atoms and selected from the group consisting of acrylic acid esters and methacrylic acid esters soluble in the non-aqueous solvent but which become insoluble therein upon being polymerized, in the presence of a dispersion stabilizing resin which is dissolved or dispersed in a colloidal form in the non-aqueous solvent and which comprises a graft copolymer composed of (1) at least one macromonomer (M) having a weight average molecular weight of from 1×10^3 to 1×10^5 and having a polymerizable double bond group represented by the general formula (II) below bonded at a terminal of the main chain of a polymer composed of at least one polymer component represented by the general formula (Ia) or (Ib) described below, and (2) at least one monomer represented by the general formula (III) below;



(Ia)

wherein X_0 represents at least one linking group selected from the group consisting of —COO—, —OCO—, —$(CH_2)_k$—OCO—, —$(CH_2)_k$—COO—, —O—, —CONHCOO—, —CONHCO—, —SO_2—CO—,



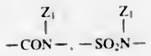
wherein Z_1 represents a hydrogen atom or a hydrocarbon group, and k represents an integer of 1 to 3); a_1 and a_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z_2 or —COO—Z_2 bonded via a hydrocarbon group (wherein Z_2 represents a hydrogen atom or a hydrocarbon group which may be substituted); and Q_0 represents an aliphatic group having from 1 to 22 carbon atoms;

(Ib)

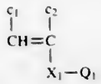
wherein Q represents —CN or a substituted or unsubstituted phenyl group wherein the substituent is a halogen atom, an alkoxy group or —$COOZ_3$ (wherein Z_3 represents an alkyl group, an aralkyl group or an aryl group); and a_1 and a_2 have the same meanings as defined for a_1 and a_2 in the general formula (Ia) above;

(II)

wherein V represents —COO—, —OCO—, —$(CH_2)_k$—OCO—, —$(CH_2)_k$—COO—, —O—, —CONHCOO—, —CONHCO—, —SO_2—CO—,



or a phenylene group (wherein Z_1 represents a hydrogen atom or a hydrocarbon group, and k represents an integer of 1 to 3); b_1 and b_2, which may be the same or different, have the same meanings as a_1 and a_2 defined in the general formula (Ia) or (Ib); and



(III)

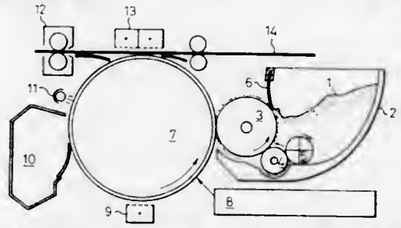
wherein X_1 has the same meaning as V defined in the general formula (II), Q_1 represents a hydrogen atom, an aliphatic group having from 1 to 22 carbon atoms, or an aromatic group having from 6 to 12 carbon atoms, and c_1 and c_2, which may be the same or different, have the same meanings as a_1 and a_2 defined in the general formula (Ia) or (Ib), provided that in the macromonomer represented by the general formula (Ia) and the monomer component represented by the general formula (III), at least one of Q_0 and Q_1 represents an aliphatic group having from 4 to 22 carbon atoms, and that, when the graft copolymer is composed of a macromonomer represented by the general formula (Ib) and the monomer component represented by the general formula (III), Q_1 represents an aliphatic group having from 4 to 22 carbon atoms.

5,589,313

METHOD FOR NONMAGNETIC MONOCOMPONENT DEVELOPMENT

Satoshi Takezawa; Yoshimichi Katagiri; Yasushige Nakamura, and Norio Sawatari, all of Kawasaki, Japan, assignors to Fujitsu, Ltd., Kawasaki, Japan

Continuation of Ser. No. 177,192, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 965,362, Dec. 17, 1992, abandoned. This application Feb. 22, 1996, Ser. No. 605,838
Claims priority, application Japan, Apr. 19, 1991, 3-088548
Int. Cl.[6] G03G *9/08*
U.S. Cl. 430—122 **26 Claims**



1. A method for nonmagnetic monocomponent development, comprising the steps of:

(a) forming a nonmagnetic toner as a developer, the toner having a BET specific surface area of not more than 4.50 m^2/g, the toner being formed by the substeps comprising:

forming minute particles by emulsion polymerizing a radically polymerizable monomer in an aqueous type solvent in the presence of a water-soluble initiator;

coagulating the minute particles; and

heating the coagulated minute particles and thermally fusing adjacent coagulated minute particles;

(b) allowing the developer to be transported by a developer carrier to a latent image carrier; and

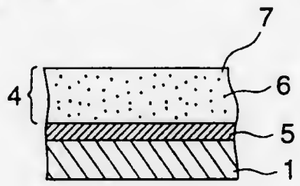
(c) causing a layer thickness-regulating member to supply an electric charge to the developer while regulating the thickness of a layer of the developer.

5,589,314

IMAGE FORMING METHOD USING AN IMIDAZOLE-PERYLENE ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Yoshihiko Etoh; Takeo Oshiba; Asao Matsushima, all of Hachioji; Hirofumi Hayata, Hino; Tomoo Sakimura, Hino; Tomoko Suzuki, Hino, and Akira Kinoshita, Hino, all of Japan, assignors to Konica Corporation, Japan

Filed Jun. 15, 1995, Ser. No. 490,781
Claims priority, application Japan, Jun. 22, 1994, 6-140363
Int. Cl.[6] G03G *13/04;13/22*
U.S. Cl. 430—126 **6 Claims**



1. An image forming method using an electrophotographic photoreceptor comprising the steps of:

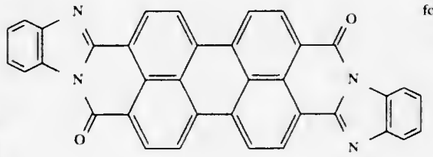
(1) charging the electrophotographic photoreceptor, wherein said electrophotographic photoreceptor comprising a conductive support and provided thereon, a carrier generation layer and a carrier transportation layer, said carrier generation layer comprising a carrier generation material which is formula 1 or 2 and having X-ray diffraction pattern having peaks at 6.3°±0.2°, 12.4°±0.2°, 25.3°±0.2° and 27.1°±0.2° in Bragg angle (2θ) when using Cu-Kα ray as a X-ray radiation source in which said peak of 12.4°±0.2° has a maximum intensity and has a half width of 0.65° or more; no peak being present at 11.5°±0.2°,

(2) imagewise exposing the charged photoreceptor for an exposure time of 1×10^{-4} to 3×10^{-2} seconds,

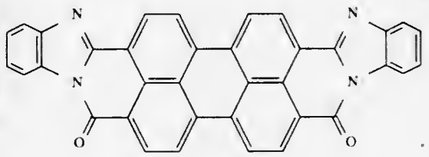
(3) developing the imagewise exposed photoreceptor to form an image, and

(4) transferring the formed image to an image receiving material:

formula 1



formula 2



5,589,315

PHOTOSENSITIVE COMPOSITIONS COMPRISING PHOTOSENSITIVE POLYFUNCTIONAL AROMATIC DIAZO COMPOUNDS, AND PRESENSITIZED LITHOGRAPHIC PLATES FORMED WITH THE SAME

Hirotada Iida; Noriaki Tochizawa; Yasuo Kuniyoshi; Masaharu Watanabe; Katsuyo Tokuda, and Ichiro Hozumi, all of Funabashi, Japan, assignors to Toyo Gosei Kogyo Co., Ltd., Japan

Division of Ser. No. 95,743, Jul. 21, 1993, Pat. No. 5,430,130. This application Jan. 6, 1995, Ser. No. 369,503
Claims priority, application Japan, Jul. 24, 1992, 4-198512; Jun. 11, 1993, 5-140441
Int. Cl.[6] G03F *7/021;7/12;* **G03C** *1/54;1/77*
U.S. Cl. 430—163 **4 Claims**

1. A photosensitive composition comprising:

(a) a photosensitive polyfunctional aromatic diazo compound selected from the group consisting of Formula (I) and Formula (II):

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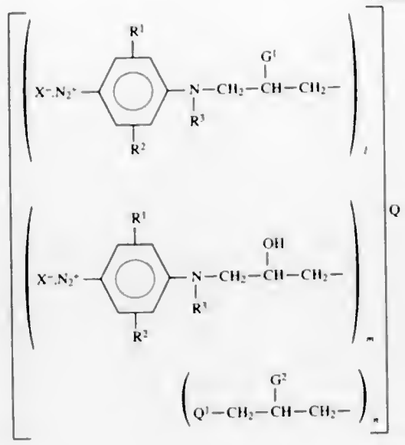
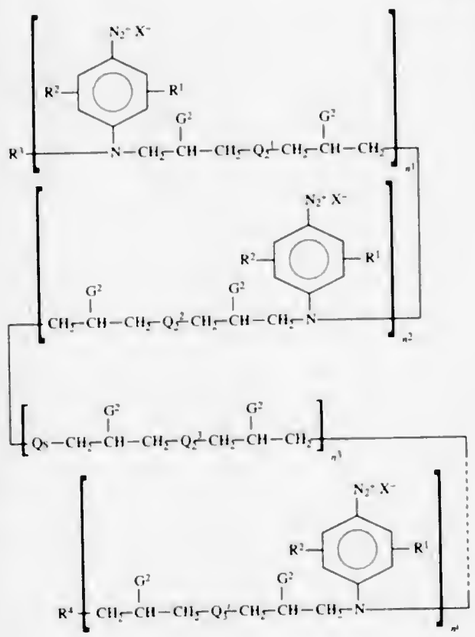
Formula (I)



Formula (II)



wherein l, m, and n are integers, l=2 to 10, m=0 to 5, n=0 to 5, and l+m+n=2 to 20; n^1 to n^l are integers from 0 to 10, $n^1+n^2+n^3+\ldots+n^l=2$ to 20;

X^- is an anion selected from the group consisting of chloride, bromide, sulfate, hydrogensulfate, phosphate, phosphite, tetrafluoroborate, hexafluorophosphate, chloride-zinc chloride, trifluoroacetate, oxalate, alkylsulfonate having 1 to 8 carbon atom, trifluoromethane sulfonate, arylsulfonate having 6 to 24 carbon atoms and 2-hydroxy-4-methoxybenzopbenone-5-sulfonate;

G^1 is selected from the group consisting of chlorine, methoxy, ethoxy, propoxy, butoxy, octyloxy, benzyloxy, phenethyloxy, methylbenzyloxy, carboxymethyloxy, carboxyethyloxy, carboxypropyloxy, methoxymethyloxy, 2-tetrahydropyranyloxy, allyloxy, crotyloxy, sulfoethyloxy, sulfopropyloxy, acetoxy, propionyloxy, butyryloxy, hexanoyloxy, chloroacetyloxy, oxaloxy, carboxyethylcarbonyloxy, carboxypropylcarbonyloxy, and N-phenylcarbamoyloxy;

G^2 is selected from the group consisting of hydroxyl group and the same as G^1, provided however, that the number of hydroxyl groups represented by G^2 in the diazo compound of Formula (II) is 0 to 10, and the number of the same groups as G^1 is 2 to 20;

Q is a polyvalent group derived from the following compounds from which (l+m+n) hydrogen atoms are removed by reacting with (l+m+n) molecules of epichlorohydrin: compounds selected from the group consisting of ammonia, primary alkylamines having 1 to 20 carbon atoms, primary aralkylamines having 7 to 20 carbon atoms, polyamines of 4 to 30 carbon atoms having two or more secondary amino groups in the molecule, dihalogenoaniline, trihaiogenoaniline, trialkylaniline, 4,4'-diaminodiphenylsulfone, aniline-formaldehyde condensate, ethanolamine, diethanolamine, glycine, β-alanine, 6-aminohexanoic acid, p-aminobenzoic acid, anthranilic acid, sulfanilic acid, taurine, ethylenediamine, xylylenediamine, ethyleneurea, hydantoin, isocyanuric acid; ethylene glycol, propylene glycol, butylene glycol, xylylene glycol, glycerin, sorbitol, sorbitan, pentaerythritol, tris(2-hydroxyethyl) isocyanurate; 4,4'-dihydroxydiphenylmethane, bisphenol A, tetrabromobisphenol A, bis(4-hydroxyphenyl)acetic acid, 2,2-bis(4-hydroxyphenyl)propionic acid, 4,4'-dihydroxydiphenyl ether, 4,4'-dihydroxydiphenyl sulfone, 1,1,2,2-tetra(4-hydroxyphenyl)ethane, phenol-novolak resin, cresol-novolak resin, catechol, resorcinol, hydroquinone, pyrogallol, gallic acid, dihydroxynaphthalene; dimercaptoalkanes having 2 to 18 carbon atoms, dimercaptoaralkanes having 8 to 20 carbon atoms, dimercaptoethers having 4 to 20 carbon atoms, dimercaptobenzene; dialkyl malonate, N,N'-diacetoacetylalkylenediamine, N,N'-diacetoacetylaryienediamine, N,N'-diacetoacetylaralkylenediamine, diethylenetriamine, triethylenetetramine; aminophenol, hydroxythiophenol, aminothiophenol, and N-acetoacetylthiophenol;

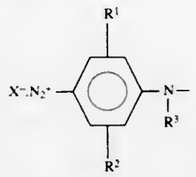
Q_1 is a monovalent group derived from the following compounds reacting with one molecule of epichlorohydrin; compounds selected from the group consisting of secondary amines of 2 to 30 carbon atoms having the same or two different alkyls, aralkyls, or aryls, N-methyltaurine, N-methylanthranilic acid, and N-ethylsulfanilic acid; alkyl alcohols having 1 to 20 carbon atoms, aralkyl alcohols having 7 to 30 carbon atoms, phenol and alkyl phenols, p-hydroxybenzoic acid, salicylic acid, and hydroxybenzenesulfonic acid; alkyl or aralkyl mercaptans having 1 to 30 carbon atoms, thiophenol and alkyl thiophenol; 2-mercaptoethanesulfonic acid, mercaptoacetic acid, mercaptopropionic acid, mercaptosuccinic acid, and mercaptobenzoic acid; alkylcyanoacetate, dialkyl esters of alkylmalonic acid, acetoacetylarylamide, hydrogen halides, phosphonic acid, phosphinic acid, and thiosulfate;

Q_2^1 to Q_2^l and Q_s are divalent groups derived from the following compounds reacting with two molecules of epichlorohydrin: Compounds selected from the group consisting of primary alkylamines having 1 to 12 carbon atoms, aralkylamines having 7 to 20 carbon atoms, dihalogenoanitines, trihalogenoanilines, trialkylanilines, ethanolamines, glycine, β-alanine, 6-aminohexanoic acid, p-aminobenzoic acid, anthranilic acid, sulfanilic acid, taurine, ethyleneurea, hydantoin, alkylene glycols, aralkylene glycols, 4,4'-dihydroxydiphenylmethane, bis(4-hydroxyphenyl)acetic acid, 2,2-bis(4-hydroxyphenyl)propionic acid, bisphenol A, tetrabromobisphenol A, 4,4'-dihydroxydiphenyl ether, 4,4'-dihydroxydiphenyl sulfone, catechol, resorcinol, hydroquinone, dihydroxynaphthalenes; dimercaptoalkanes having 2 to 12 carbon atoms, dimercaptoaralkanes having 8 to 20 carbon atoms, dimercapto ethers having 7 to 20 carbon atoms, dimercaptobenzene; dialkyl malonates, N,N'-diacetoacetylalkylenediamines, N,N'-diacetoacetylarylenediamines, N,N'-diacetoacetylaralkylenediamines, N-alkylaminophenols, hydroxythiophenol, N-alkylaminothiophenols, and N-acetoacetylthiophenol;

R^1 and R^2 are each selected from the group consisting of hydrogen, alkyl having 1to 8 carbon atoms and alkoxy having 1 to 8 carbon atoms;

R^3 is selected from the group consisting of alkyl or substituted alkyl having 1 to 8 carbon atoms, aralkyl or substituted aralkyl having 7 to 14 carbon atoms, and Q_1—CH_2—CHG^2—CH_2—;

R^4 is selected from the group consisting of Q_1 and G^2, or is the following group:



wherein X^-, R^1, R^2, and R^3 denote the same groups as above;

(b) an oleophilic resinous binder which comprises a high molecular weight organic compound containing at least one of an aliphatic or aromatic hydroxyl group, carboxyl group, sulfo group, carbamoxy group or a sulfonamide group; and

(c) at least one additive selected from the group consisting of dyes, surface active agents, plasticizers, oleophilic compounds, and stabilizers;

said composition being coated on a base material selected from the group consisting of an aluminum plate, a sheet of paper, a plastic film, a glass plate, and a screen mesh comprising a synthetic resin or stainless steel.

5,589,316

DYES AND DYE-DONOR ELEMENTS FOR THERMAL DYE TRANSFER RECORDING

Luc Vanmaele, Lochristi, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

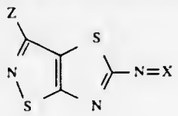
Filed Sep. 11, 1995, Ser. No. 526,848

Claims priority, application European Pat. Off., Sep. 13, 1994, 94202634

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 430—200 **12 Claims**

1. Dye-donor element for use according to thermal dye sublimation transfer, said dye-donor element comprising a support having thereon a dye layer comprising a polymeric binder and a dye corresponding to the following general formula (I):

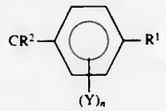


(I)

wherein:

Z represents hydrogen or a substituent,

X represents N-R or



R represents NR^3R^4;

R^1 represents NR^3R^4 OR^{12} or SR^{12};

R^2 represents hydrogen cyano COR^{13}, CO^2R^{13}, $CONR^{14}R^{15}$, SO_2R^{16};

R^3 and R^4 each independently represent hydrogen, an alkyl group, an alkynyl group, an aryl group, an alkenyl group, a heterocyclic group or R^3 and R^4 together with the atoms to which they are attached represent the atoms necessary to complete a ring or R^3 and/or R^4 and one of the Y-substituents together with the atoms to which they are attached represent the necessary atoms to form a 5- or 6- membered, fused-on heterocyclic ring;

Y represents a substituent:

n represents 0, 1, 2, 3 or 4, the substituents being the same or different when n is greater than 1 or two or more Y substituents can form an annelated ring system:

R^{12}, R^{13}, R^{14} and R^{15} each independently represent hydrogen, in alkyl group, an alkenyl group, an alkynyl group, an aryl group, a heterocyclic ring or R^{14} and R^{15} together with the atoms to which they are attached represent the necessary atoms to form a 5- or 6-membered ring or R^{13} or R^{14} or R^{15} or R^{14} and R^{15} together with one of the Y-substituents and the atoms to which they are attached represent the necessary atoms to form a 5- or 6-membered fused-on heterocyclic ring;

R^{16} represents hydroxy, an alkoxy group, an aryloxy group, $NR^{17}R^{18}$, an aryl group or an alkyl group, an alkenyl group, an alkynyl group, or R^{16} together with one of the Y-substituents and the atoms to which they are attached represent the necessary atoms to form a 5- or 6-membered fused-on heterocyclic ring:

R^{17} and R^{18} each independently represent hydrogen, an alkyl group, an alkenyl group, an alkynyl group, an aryl group, a heterocyclic ring or R^{17} and R^{18} together with the atoms to which they are attached represent the necessary atoms to form a 5- or 6-membered ring.

5,589,317

THERMAL TRANSFER IMAGING PROCESS

Geert Defieuw, Kessel-Lo; Wilhelmus Janssens, Aarschot; Herman Uytterhoeven, Bonheiden; Bart Horsten, Rumst; Jean-Marie Dewanckele, Drongen, and Jan Van den Bogaert, Schilde, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 8, 1995, Ser. No. 400,337

Claims priority, application European Pat. Off., Mar. 10, 1994, 94200612

Int. Cl.[6] G03C *8/40;8/44*

U.S. Cl. 430—203 **9 Claims**

1. A thermal imaging process comprising in order, the steps of:

a) bringing a donor layer of a donor element into face to face relationship with a receiving layer of a receiving element to obtain an assemblage,

b) image-wise heating the assemblage by means of a thermal head, thereby causing image-wise transfer of an amount of a thermotransferable reducing agent to said receiving element in accordance with the amount of heat supplied by said thermal head,

c) separately said donor element from said receiving element, and

d) overall heating said receiving element, wherein

(i) said donor element comprises said donor layer on a support, wherein said donor layer comprises both a binder and a thermotransferable reducing agent which is capable of reducing a silver source to metallic silver upon heating, and

(ii) said receiving element comprises said receiving layer on a support, said receiving layer comprising a silver source which is capable of being reduced by means of a heat in the presence of a reducing agent.

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5,589,318

HIGH CONTRAST PHOTOGRAPHIC SILVER HALIDE MATERIAL

Allison Hazel C. Dale, Mill End; Roger H. Piggin, Abbots Langley; Richard A. Hallett, East Finchley, and Paul R. McIntyre, South Oxhey, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 400,155, Mar. 7, 1995, abandoned.
This application Jan. 4, 1996, Ser. No. 583,198
Claims priority, application United Kingdom, Apr. 16, 1994, 9407599; Dec. 21, 1994, 9425802
Int. Cl.[6] G03C *1/035;1/08*
U.S. Cl. 430—264 **10 Claims**

1. A high contrast photographic material comprising a support bearing a silver halide emulsion layer; said photographic material containing, in said emulsion layer or an adjacent hydrophilic colloid layer, a hydrazide nucleating agent and said photographic material being characterised in that said emulsion layer comprises silver halide grains which are spectrally sensitised with a non-desorbing sensitising dye and silver halide grains which are not spectrally sensitised; both said spectrally sensitised silver halide grains and said non-spectrally-sensitised silver halide grains contributing, as a consequence of the presence of said hydrazide nucleating agent in said photographic material, to the visible silver image that is produced by imagewise exposure and development of said photographic material.

5,589,319

PHOTOSENSITIVE POLYIMIDE RESIN COMPOSITION

Kouichi Katou; Eiji Watanabe, both of Kanagawa, and Kouichi Kunimune, Chiba, all of Japan, assignors to Chisso Corporation, Osaka, Japan

PCT No. PCT/JP93/00853, § 371 Date Feb. 17, 1994, § 102(e) Date Feb. 17, 1994, PCT Pub. No. WO94/00800, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 24, 1993, Ser. No. 196,125
Claims priority, application Japan, Jun. 25, 1992, 4-190155
Int. Cl.[6] G03C *1/73*
U.S. Cl. 430—288.1 **16 Claims**

1. A photosensitive resin composition which comprises (1) 100 parts by weight of a fluorine-containing polyimide, (2) 10–100 parts by weight of an isocyanurate having a (meth)acrylic group, (3) 10–100 parts by weight of a polyalkylene glycol di(meth)acrylate, and (4) 0.5–20 parts by weight of a photopolymerization initiator as essential components.

5,589,320

POLYMERIC FLUORESCENT SUBSTANCE AND ORGANIC ELECTROLUMINESCENCE DEVICES USING THE SAME

Toshihiro Ohnishi; Takanobu Noguchi, and Shuji Doi, all of Tsukuba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 14, 1994, Ser. No. 274,798
Claims priority, application Japan, Jul. 21, 1993, 5-180247; Sep. 24, 1993, 5-237851
Int. Cl.[6] G03C *5/00*
U.S. Cl. 430—321 **7 Claims**

1. An organic electroluminescence device at least having a light emitting layer between two electrodes consisting of an anode and a cathode forming a counterpart thereto at least one of which electrodes is transparent or semi-transparent, wherein said light emitting layer comprises

a polymeric fluorescent substance which is soluble in organic solvents, has a number-average molecular weight of 10^3 to 10^7 and contains, as main constituents, three different repeating units A, B and C selected from the repeating units presented by the following formula (1), wherein the ratios of the respective repeating units in the polymeric substance are such that when the repeating unit constituting the polymer having the longest optical absorption edge wavelength is expressed by A, the repeating unit constituting the polymer having the next longest absorption edge wavelength is expressed by B and the repeating unit constituting the polymer having the shortest optical absorption edge wavelength is expressed by C, A is contained in an amount of 2–60 mol %, B in an amount of 5 . 60 mol % and C in an amount of 20–50 mol % based on the total number of the three different repeating units:

$$—Ar—CH=CH— \quad (1)$$

wherein Ar is an arylene group having 6 to 20 carbon atoms, a heterocyclic compound group having 4 to 20 carbon atoms or a divalent group represented by the following formula (2) and at least one of the repeating units At B and C has at least one substituent group selected from an alkyl group, an alkoxy group and an alkythio group having 2 to 22 carbon atoms, an aryl group and an aryloxy group having 6 to 60 carbon atoms and a heterocyclic compound group having 4 to 60 carbon atoms:

$$—Ar_1—X_1—R—X_2—Ar_2— \quad (2)$$

wherein Ar_1 and Ar_2 are respectively an arylene group having 6 to 20 carbon atoms or a heterocyclic compound group having 4 to 20 carbon atoms and optionally containing at least one substituent of at least one species of a group selected from an alkyl group, an alkoxy group and an alkylthio group having 2 to 22 carbon atoms, an aryl group and an aryloxy group having 6 to 60 carbon atoms and a heterocyclic compound group having 4 to 60 carbon atoms; R is a hydrocarbon or a heterocyclic compound group having 1 to 22 carbon atoms;

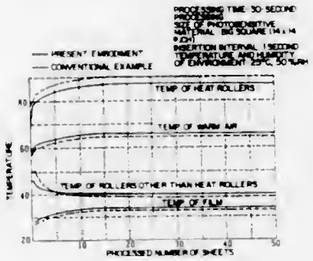
and X_1 and X_2 represent independently —O—, —S—, —COO— or —OCO—.

5,589,321

METHOD OF AND APPARATUS FOR CONTROLLING DRYING OF PHOTOGRAPHIC MATERIAL

Shinichi Matsuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 19, 1994, Ser. No. 277,168
Claims priority, application Japan, Jul. 20, 1993, 5-179373
Int. Cl.[6] G03C *1/725;1/73;5/18;5/26*
U.S. Cl. 430—432 **6 Claims**



1. A method of controlling drying of a photographic material wherein after a photosensitive material is processed by processing solutions, heating the resulting photographic material by a contact-heating device, and blowing warm air onto said photographic material, further comprising the step of:

controlling the temperatures of said contact-heating device and the warm air so that relative contributions of drying of said photographic material by said contact-heating device and the warm air are always constant.

5,589,322

PROCESS FOR MAKING A DIRECT DISPERSION OF A PHOTOGRAPHICALLY USEFUL MATERIAL

Lloyd A. Lobo, Webster, and Aileen M. Svereika, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1995, Ser. No. 570,995
Int. Cl.[6] G03C *7/388;1/025;1/38;1/005*
U.S. Cl. 430—449 **16 Claims**

1. A process for making a direct dispersion of a photographically useful material comprising: subjecting a mixture of an aqueous gelatin solution, a liquid organic phase comprising a photographically useful material, and an ionic polymer to conditions of high shear or turbulence to form a fine dispersion of the organic phase having an average particle size of less than 0.5 micron dispersed in the aqueous solution; wherein the ratio of the organic phase viscosity to the aqueous gelatin solution viscosity in the absence of the ionic polymer, measured at the temperature of the dispersion forming step, is greater than a value of 2.0, and the ionic polymer is a water soluble or dispersible substantially non-surface active polyelectrolyte which has a molecular weight of at least 10,000 selected from:

i) synthetic polymers derived from at least 5 mole % of monomers which contain $—OSO_3M$, $—SO_3M$, —COOM, or $—OPO(OM)_2$ substituent groups where M represents a hydrogen atom or a cationic counterion, and

ii) polysaccharide materials bearing at least one suDstituent group as described in i) per saccharide unit.

5,589,323

CHEMICALLY STABLE ASCORBATE-BASED PHOTOGRAPHIC DEVELOPER AND IMAGING PROCESS

John L. Adkins, Smyrna, Ga., and Dinesh P. Patel, Edison, N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Filed Jan. 23, 1996, Ser. No. 589,918
Int. Cl.[6] G03C *5/29*
U.S. Cl. 430—492 **12 Claims**

1. A process for forming a high contrast photographic image comprising the steps of:

a) imagewise exposing a silver halide photographic element containing a hydrazine compound which functions as a nucleating agent, wherein said element is free of incorporated amine boosters; and

b) developing said exposed element with a chemically stable aqueous alkaline developing solution that is free of dihydroxybenzene developing agents and has a pH between 9.5 and 11, said developing solution comprising:

i. an ascorbic acid developing agent;

ii. an auxiliary developing agent; and

iii. a combination of an alkali metal carbonate and an alkali metal borate comprising between 0.125 and 0.5 molar concentration of said carbonate and between 0.04 and 0.35 molar concentration of said borate.

5,589,324

ANTISTATIC LAYER FOR PHOTOGRAPHIC ELEMENTS COMPRISING POLYMERIZED POLYFUNCTIONAL AZIRIDINE MONOMERS

Allan J. Wexler, Vestal, N.Y., assignor to International Paper Company, Purchase, N.Y.

Filed Jul. 13, 1993, Ser. No. 91,335
Int. Cl.[6] G03C *1/89*
U.S. Cl. 430—529 **28 Claims**

1. A photographic element comprising a support having at least one surface, at least one photosensitive layer on the support, and a permanent antistatic layer coated on at least one surface of the support,

wherein the antistatic layer comprises a distinct layer, said antistatic layer comprising a polymer polymerized on said support from monomers, in the presence of a water-soluble, electrically conductive polyelectrolyte, wherein the monomers comprise polyfunctional aziridines,

wherein said polymer entraps the polyelectrolyte,

wherein said polyelectrolyte contains ionizable functional groups selected from the group consisting of salts of sulfonic acid and salts of hydrogen sulfate, and

wherein the weight ratio of the monomers to the polyelectrolyte is greater than 0.3 but less than or equal to 1.0.

5,589,325

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Koichi Kuno, and Shuzo Suga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 331,193, Oct. 28, 1994, abandoned.
This application Jan. 22, 1996, Ser. No. 589,210
Claims priority, application Japan, Nov. 1, 1993, 5-293825
Int. Cl.[6] G03C *1/12*
U.S. Cl. 430—576 **3 Claims**

1. A silver halide photographic material comprising a support having provided thereon at least one light-sensitive silver halide emulsion layer, wherein the emulsion is spectrally sensitized with at least one compound selected from the compounds represented by the following formulae (1) and (2) and contains a compound represented by the following formula (5):

$$[DYE]_n(G)_n \quad (1)$$

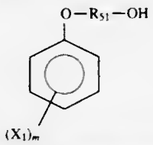
$$[DYE]_n(G^-)_n \quad (2)$$

wherein DYE represents a methine dye; G and G^- each represents a substituent of the methine dye, wherein G and G^- are represented by the following formula (3) and (4) respectively; and n is an integer of from 1 to 3:

$$—T^1—G^1NHG^2 \quad (3)$$

$$—T^1—G^1N^{\ominus}G^2 \quad (4)$$

wherein T^1 represents a divalent linking group; G^1 represents a carbonyl group, a sulfinyl group or a sulfonyl group; G^2 represents $—CO—T^2$, $—SO—T^2$, $—SO_2—T^2$ or a cyano group; and T^2 represents a monovalent group:



(5)

wherein R_{52} represents an unsubstituted an alkylene group having from 1 to 6 carbon atoms; X_1 represents a halogen atom, a nitro group, an akyl group, a substituted or unsubstituted amino group, $—CO—R_{52}$ or $—SO_3M$, in which R_{52} represents a hydrogen atom, —OM, an alkyl group, an alkoyl group or a substituted or unsubstituted amino group; M represents a hydrogen atom, an alkali metal atom or an atomic group which is a monovalent cation; and m represents 0 or an integer of from 1 to 5;

wherein the compound represented by formula (5) is added in an amount of 0.05 mol or more per mol of the silver halide.

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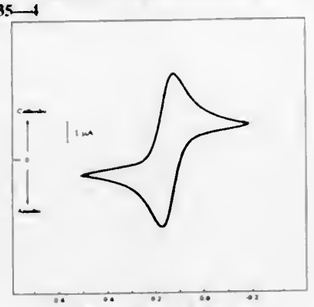
5,589,326

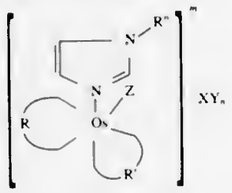
OSMIUM-CONTAINING REDOX MEDIATOR

Zhi D. Deng; Gerald F. Sigler, both of Carmel; Nigel A. Surridge, Indianapolis; Christopher D. Wilsey, Carmel; Robert J. McEnroe, Noblesville; Walter W. Jernigan, and Rebecca W. Muddiman, both of Indianapolis, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Dec. 30, 1993, Ser. No. 180,492
Int. Cl.[6] C12Q *1/00;1/37;1/26*
U.S. Cl. 435—4 **11 Claims**



1. A compound having the formula:



wherein

R and R' are the same or different and are 2,2'-bipyridyl, 4,4'-disubstituted-2,2'-bipyridyl, 5,5'-disubstituted-2,2'-bipyridyl, 1,10-phenanthrolinyl, 4,7-disubstituted-1,10-phenanthrolinyl, or 5,6-disubstituted-1,10-phenanthrolinyl, wherein the disubstitution is a methyl, ethyl, or phenyl group,

R and R' are coordinated to Os at their nitrogen atoms,

R" is hydrogen, methyl or ethyl,

Z is chloro or bromo,

m is +1 or +2,

X is an anion and is chloride, bromide, iodide, fluoride, tetrafluoroborate, perchlorate, nitrate, sulfate, carbonate, or sulfite,

Y is an anion and is chloride, bromide, iodide, fluoride, tetrafluoroborate, perchlorate or nitrate, and

n is 1 or zero,

but when X is sulfate, carbonate, or sulfite, n is zero,

and when m is 1, n is zero and X is not sulfate, carbonate or sulfite,

wherein the aqueous solubility of the compound is greater than about 1 millimolar.

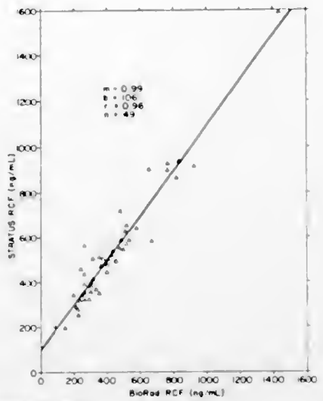
5,589,327

METHOD AND COMPOSITION FOR THE DETERMINATION OF RED BLOOD CELL FLOATE

Kathy Hilyard, Pembroke, Fla.; James Monticello, New City, N.Y., and James Rugg, North Miami, Fla., assignors to Dade International Inc., Deerfield, Ill.

Filed Jul. 18, 1994, Ser. No. 276,293
Int. Cl.[6] C12Q *1/00;* **G01N** *33/53;33/48*
U.S. Cl. 435—4 **22 Claims**

1. A composition useful for the determination of folate from a hemolysate of red blood cells in a non-radiolabeled assay comprising:



a) a detergent; and

b) a buffer;

wherein the composition solubilizes membranes of red blood cells in the hemolysate and allows for the determination of folate in said non-radiolabeled assay.

5,589,328

CHEMILUMINESCENCE ASSAYS BASED ON INDOXYL SUBSTRATES, THIOINDOXYL SUBSTRATES AND OTHER SUBSTRATES

Vijay K. Mahant, 5669 Amaya Dr., #367, La Mesa, Calif. 91942

Continuation-in-part of Ser. No. 286,697, Aug. 4, 1994, abandoned. This application Mar. 15, 1995, Ser. No. 404,545
Int. Cl.[6] C12Q *1/00;1/34;1/44*
U.S. Cl. 435—4 **20 Claims**

1. A method for determining enzyme activity in a sample comprising:

combining the sample with a substrate selected from indoxyl ester, thioindoxyl ester and benzofuran ester to produce a hydrolysis product upstream of H_2O_2 production;

reacting the hydrolysis product upstream of H_2O_2 production with a chemiluminescence generating reagent to produce chemiluminescence;

measuring the chemiluminescence produced; and

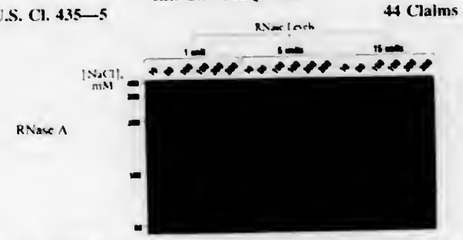
correlating the chemiluminescence measured with the enzyme activity in the sample.

5,589,329

METHODS AND COMPOSITIONS FOR DETECTING BASE PAIR MISMATCHES

Matthew Winkler, Austin, and Marianna M. Goldrick, Pflugerville, both of Tex., assignors to Ambion, Inc., Austin, Tex.

Filed Nov. 15, 1993, Ser. No. 155,937
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—5 **44 Claims**



1. A method for detecting a base pair mismatch between a nucleic acid sample and a single stranded RNA probe, comprising the steps of:

(a) separately contacting a single stranded RNA probe with a control nucleic acid sample and a test nucleic acid sample, thereby forming a control duplex, which is free from mismatches, and a test duplex;

(b) treating said control duplex and said test duplex with a composition comprising an RNase enzyme at a final concentration of between about 0.1 ng/ml and about 4000 ng/ml in a final salt concentration of between about 3 mM and about 90 mM; and

(c) detecting a difference in the products of said RNase treated duplexes;

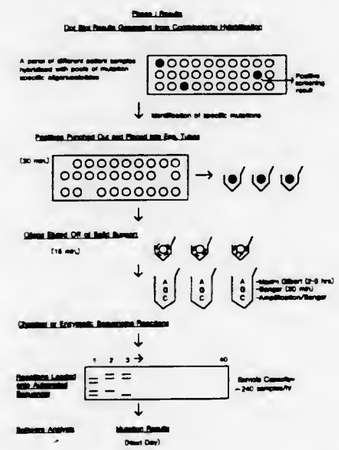
wherein said difference indicates a base pair mismatch.

5,589,330

HIGH-THROUGHPUT SCREENING METHOD FOR SEQUENCE OR GENETIC ALTERATIONS IN NUCLEIC ACIDS USING ELUTION AND SEQUENCING OF COMPLEMENTARY OLIGONUCLEOTIDES

Anthony P. Shuber, Millford, Mass., assignor to Genzyme Corporation, Cambridge, Mass.

Filed Jul. 28, 1994, Ser. No. 281,940
Int. Cl.[6] C12Q *1/68;1/70;* **C12P** *19/34*
U.S. Cl. 435—5 **18 Claims**



1. A method for high-throughput screening of mammalian genomic DNA samples to identify one or more genetic alterations in one or more target DNA sequences present in said samples, comprising the steps of:

(i) immobilizing a plurality of said mammalian genomic DNA samples on a solid-phase support;

(ii) simultaneously hybridizing said immobilized DNA samples with a multiplicity of synthetic oligonucleotides of equivalent length, each of said oligonucleotides comprising a variant sequence of one of said target DNA sequences;

(iii) removing oligonucleotides that do not hybridize to said immobilized DNA samples;

(iv) individually eluting from each of said immobilized DNA samples oligonucleotides that hybridize to said samples; and

(v) determining the sequence of said individually eluted oligonucleotides;

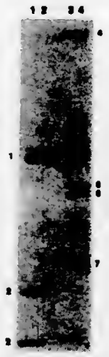
wherein the sequence identifies said one or more genetic alterations.

5,589,331

METHOD FOR DETECTING ABNORMAL SEROTONERGIC FUNCTION

David A. Nielsen, Kensington; David Goldman, Potomac; Markku Linnoila, Bethesda, all of Md., and Matti Virkkunen, Helsinki, Finland, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 873,913, Apr. 24, 1992, abandoned. This application Sep. 22, 1993, Ser. No. 125,628
Int. Cl.[6] C12Q *1/68;* **C07H** *21/04;* **C12P** *19/34*
U.S. Cl. 435—6 **13 Claims**



1. A method of detecting abnormal serotonergic function in an impulsive human subject, the method comprising:

providing a nucleic acid sample from the human subject;

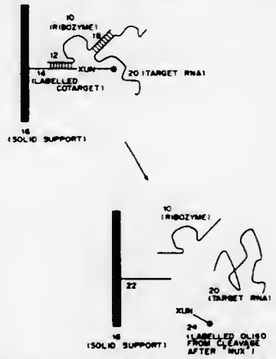
detecting the presence or absence of an L allele of the gene encoding tryptophan hydroxylase in the sample, wherein detecting the presence of the L allele detects abnormal serotonergic function in the impulsive human subject.

5,589,332

RIBOZYME AMPLIFIED DIAGNOSTICS

Andy Shih; Jeffrey M. Bockman, and Shajl T. George, all of New York, N.Y., assignors to Innovir Laboratories, Inc., New York, N.Y.

Continuation of Ser. No. 985,308, Dec. 4, 1992, abandoned. This application May 9, 1994, Ser. No. 240,081
Int. Cl.[6] C12Q *1/68;* **C07H** *21/02;21/04*
U.S. Cl. 435—6 **25 Claims**



1. A method for detecting a target nucleic acid molecule in a solution, comprising:

providing in the solution under conditions wherein two complementary nucleotide molecules will hybridize, a ribozyme molecule, a labelled co-target nucleic acid molecule and the target nucleic acid molecule, wherein the co-target and the target

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molecules have different sequences and wherein the ribozyme molecule comprises two regions complementary to portions of the co-target and target nucleic acid molecules, wherein the first portion is present on the labelled co-target nucleic acid molecule which contains a cleavage site for the ribozyme and the second portion is present on the target nucleic acid molecule, wherein the complementary regions include at least the minimum number of complementary nucleotides to obtain hybridization between the ribozyme molecule and the co-target and target nucleic acid molecules,

allowing the ribozyme molecule to react with the labelled co-target nucleic acid molecule and the target nucleic acid molecule, and

detecting the presence of free label when the target nucleic acid molecule is present in solution as compared with when the target nucleic acid molecule is not present in solution.

5,589,333

IN SITU POLYMERASE CHAIN REACTION

Omar Bagasra, Laurel Springs, N.J., and Roger J. Pomerantz, Chalfont, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 829,912, Feb. 3, 1992, abandoned. This application Apr. 11, 1994, Ser. No. 225,491

Int. Cl.[6] C12Q *1/68;1/70;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **11 Claims**

1. A method for identifying cells containing at least one copy of a selected nucleic acid sequence comprising of the steps of:

(a) heat fixing cells to a solid support at about 105° C. to produce heat fixed immobilized cells;

(b) contacting said heat fixed immobilized cells with paraformaldehyde to produce paraformaldehyde treated, heat fixed immobilized cells;

(c) contacting said paraformaldehyde treated, heat fixed immobilized cells containing selected nucleic acid sequence or nucleic acid sequences with oligonucleotide primers fully complementary to regions of selected nucleic acid sequence or sequences to form a nucleic acid hybrid and generating an extension product by the polymerase chain reaction in said cell;

(d) separating into single stranded nucleic acid molecules, the extension product generated in step (c) to provide single-stranded nucleic acid molecules of the selected nucleic acid sequence or sequences in said cells;

(e) repeating steps (c) and (d) to amplify said selected nucleic acid sequence or sequences;

(f) hybridizing a labelled nucleic acid probe to said amplified selected nucleic acid sequence or sequences provided in step (e) in said cells to produce labelled cells; and

(g) observing labelled cells produced in step (f), wherein labelled cells indicates cells containing at least one copy of a selected nucleic acid sequence.

5,589,334

ISOLATED NUCLEIC ACID MOLECULE WHICH CODES FOR A TUMOR REJECTION ANTIGEN PRECURSOR WHICH IS PROCESSED TO AN ANTIGEN PRESENTED BY HLA-B44, AND USES THEREOF

Pierre Coulie, and Thierry Boon-Falleur, both of Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Filed Jun. 3, 1994, Ser. No. 253,503

Int. Cl.[6] C12Q *1/68;* **C07H** *21/04;21/02;* **A61K** *39/00*

U.S. Cl. 435—6 **14 Claims**

1. Isolated nucleic acid molecule which codes for a tumor rejection antigen, consisting of the nucleotide sequence of SEQ ID NO: 1.

5,589,335

HYBRIDIZATION PROMOTION REAGENTS

Kevin R. Kearney, Worcester, Mass.; Mark L. Collins, Walnut Creek, Calif.; John K. Eldredge, Brewster, Mass., and David V. Morrissey, Middletown, Conn., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 93,406, Jul. 19, 1993, abandoned, which is a continuation of Ser. No. 821,334, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 333,656, Apr. 5, 1989, abandoned. This application Aug. 11, 1994, Ser. No. 290,001

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **12 Claims**

1. A reagent for performing rRNA hybridization reactions comprising a soluble salt of guanidine in a concentration of 0.7–1.7M, a soluble salt of thiocyanate in concentration of 0.7–2.4M, a soluble salt of tetramethylammonium in a concentration of 1.2–2.2M, and a soluble salt of trifluoroacetate in a concentration of 0.8–2.0M; said reagent capable of reducing ribonuclease activity, promoting the speed of hybridization processes, providing superstoichiometric labeling and equalizing the relative strength of GC and AT base pairs.

5,589,336

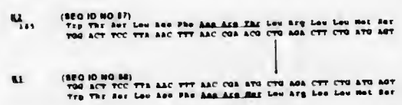
DIAGNOSTIC METHOD AND KIT FOR DETERMINING KELL BLOOD GROUP GENOTYPE

Soohee Lee, Cliffside Park, N.J., and Colvin Redman, Long Island, N.Y., assignors to New York Blood Center, New York, N.Y.

Filed Nov. 10, 1994, Ser. No. 337,268

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **57 Claims**



1. A diagnostic method for the differential determination of K1 and/or K2 genotype in a patient, comprising:

amplifying a DNA sample obtained from a patient using a primer which amplifies only K1 DNA and/or K2 DNA, including the locus which determines K1/K2 polymorphism, to identify the presence of amplified DNA corresponding to K1 DNA and/or K2 DNA.

5,589,337

METHODS AND DIAGNOSTIC KITS FOR DETERMINING TOXICITY UTILIZING BACTERIAL STRESS PROMOTERS FUSED TO REPORTER GENES

Spencer B. Farr, Longmont, Colo., assignor to The President and Fellows of Harvard College, Cambridge, Mass.

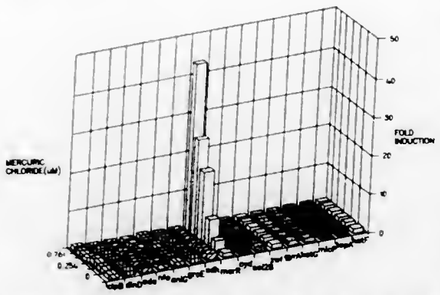
PCT No. PCT/US93/06537, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/01584, PCT Pub. Date Jan. 20, 1994

Continuation-in-part of Ser. No. 910,793, Jul. 6, 1992, abandoned. This PCT application Jul. 6, 1993, Ser. No. 367,122

Int. Cl.[6] C12Q *1/68;1/02;* **C12N** *15/63*

U.S. Cl. 435—6 **23 Claims**

1. A diagnostic kit for determining the toxicity of a compound or identifying an antitoxin to a toxic compound, said kit comprising:



a plurality of bacterial hosts, each of said hosts harboring a promoter which responds to stress, said promoter being operatively linked to a gene heterologous to said promoter and encoding an assayable product, wherein said plurality of hosts, in toto, comprise at least one promoter which responds to each of: redox stress, DNA stress, protein stress, energy stress and pH stress.

5,589,338

NUCLEIC ACIDS ENCODING A MUTANT FORM OF HUMAN SERUM ALBUMIN INVOLVED IN FAMILIAL DYSALBUMINEMIC HYPERTHYROXINEMIA

Nadhipuram V. Bhagavan; Charles E. Petersen, and Morton Mandel, all of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Division of Ser. No. 215,135, Mar. 21, 1994. This application Jan. 30, 1995, Ser. No. 380,366

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **7 Claims**

1. An isolated DNA molecule that comprises a nucleotide sequence that encodes modified HSA wherein said modification is the substitution for arginine at position 218 of said HSA, of an amino acid of lower basicity, or encodes a fragment of said modified HSA which contains said modification and which exhibits thyroxin-binding activity at least 10% of that of the corresponding full-length modified HSA.

5,589,339

SUBTRACTION HYBRIDIZATION

Ian N. Hampson; Lynne Pope, both of Heywood, and John Butler, Stockport, all of United Kingdom, assignors to Amersham International PLC, Bucks, United Kingdom

Continuation of Ser. No. 43,744, Apr. 7, 1993. This application Jun. 6, 1995, Ser. No. 467,716

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **17 Claims**

1. In a subtraction hybridization process wherein single stranded cDNA derived from transcript RNA of a target cell source is reacted under hybridizing conditions with excess single stranded hybridization driver nucleic acid derived from transcript RNA of a reference source so as to cause substantially all said cDNA having a nucleotide sequence complementary to RNA that is common to both said sources to become bound in duplex molecules whereby the only single stranded cDNA then remaining is that having a sequence complementary to transcript RNA that is specific to the target cell source, that is, unique cDNA derived solely from said target cell source, the improvement which comprises the step of treating the reaction mixture with an aziridinylbenzoquinone interstrand cross-linking agent effective selectively to chemically cross-link the nucleotide strands in the duplex molecules, thereby increasing the stability of these molecules, without affecting the remaining unsubtracted single stranded cDNA; and subsequently subjecting the unsubtracted single stranded unique cDNA to random primed labelling in the presence of the chemically cross-linked duplex molecules, using a DNA polymerase lacking exonuclease activity and inactive with respect to said duplex molecules, thereby synthesizing labeled DNA strands complementary to said single stranded unique cDNA, and recovering the labeled product in a form usable as a hybridization probe for detecting a nucleotide sequence of that gene or genes of the target cell source responsible for producing said transcript RNA specific to the target cell source.

5,589,340

PROCESS AND PRIMERS FOR IDENTIFYING NUCLEIC ACIDS ENCODING A-LINEAGE CONOTOXIN PEPTIDES

Baldomero M. Olivera; Lourdes J. Cruz; David R. Hillyard; J. Michael McIntosh, all of Salt Lake City, Utah, and Ameurfino D. Santos, Quezon City, Philippines, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 137,800, Oct. 19, 1993, Pat. No. 5,514,774, which is a continuation-in-part of Ser. No. 84,848, Jun. 29, 1993, Pat. No. 5,432,155. This application Jun. 7, 1995, Ser. No. 477,383

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **3 Claims**

1. A process for identifying nucleic acids encoding A-lineage conotoxin peptides which comprises obtaining a sample containing Conus nucleic acid; subjecting said nucleic acid to amplification using the primers 5'-TCTGCGAATGGGCATGCGGATGATGTT-3' (SEQ ID NO:52) and 5'-TGCTCCAACGTCGTGGTTCAGAGGGTC-3') (SEQ ID NO:53) to form amplification products; and identifying said amplification products.

5,589,341

ORIGIN OF REPLICATION COMPLEX GENES AND METHODS OF USING THE SAME

Bruce W. Stillman; Stephen P. Bell; Ryuji Kobayashi, all of Cold Spring Harbor, N.Y.; Jasper Rine, Moraga, Calif.; Margit Foss, Durham, N.C.; Francis J. McNally, Davis, Calif.; Patricia Laurenson, San Francisco, Calif.; Ira Herskowitz, Berkeley, Calif.; Joachim Li, San Francisco, Calif.; Kimberly Gavin, and Masumi Hidaka, both of Cold Spring Harbor, N.Y., assignors to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., and The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 168,479, Dec. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,105

Int. Cl.[6] C12Q *1/68;* **C12N** *15/00;1/15;* **C07K** *14/39*

U.S. Cl. 435—6 **21 Claims**

1. A method of identifying lead compounds for a pharmacological agent useful in the diagnosis or treatment of disease associated with cell growth, said method comprising the steps of:

forming a mixture comprising;

a recombinant origin or replication (ORC) protein expressed from an isolated nucleic acid encoding said ORC protein, said ORC protein selected from the group consisting of ORC1, ORC2, ORC3, ORC4, ORC5 and ORC6,

a natural intracellular ORC protein binding target, wherein said binding target is capable of specifically binding said ORC protein, and

a candidate pharmacological agent;

incubating said mixture under conditions whereby, but for the presence of said candidate pharmacological agent, said ORC protein selectively binds said binding target;

detecting the presence or absence of specific binding of said ORC protein to said binding target,

wherein the absence of said selective binding indicates that said candidate pharmacological agent is a lead compound that disrupts the cellular function of said ORC protein and thereby inhibits cell growth.

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5,589,342

KIT FOR SEPARATING DOUBLE-STRANDED NUCLEIC ACID FROM A SINGLE-STRANDED/DOUBLE-STRANDED MIXTURE OF NUCLEIC ACIDS

Jon R. Geiger, West Hartford, and Samuel I. Trotz, Orange, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 944,919, Dec. 22, 1986, Pat. No. 5,034,314. This application Nov. 19, 1990, Ser. No. 615,095
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—6 **2 Claims**

1. A kit for effecting separation of labelled probe nucleic acid molecules from hybridized probe/target nucleic acid molecules consisting essentially of:

(a) a sample of labelled probe nucleic acid molecules and

(b) a membrane filter having a pore size within a range such that unhybridized labelled probe nucleic acid molecules pass through said membrane filter whereas labelled probe nucleic acid molecules hybridized with complementary target nucleic acid molecules are retained on said membrane filter, said pore size provided a molecular weight cutoff of between 200,000 and about 300,000 Daltons, wherein said labelled probe nucleic acid molecules have an enzyme label, either covalently attached to the probe or indirectly attached to the probe by means of a biotin-avidin-biotin linkage, and wherein said kit additionally contains an enzyme substrate to assist in identification of hybridized probe/target nucleic acid molecules.

5,589,343

ANTIBODIES WHICH BIND TO MOLECULES CONTAINING AT LEAST ONE PEPTIDE SEQUENCE CARRYING ONE OR SEVERAL EPITOPES CHARACTERISTIC OF A LIVER STAGE ANTIGEN PRODUCED BY *P. FALCIPARUM* IN HEPATOCYTES

Claudine Marchand, Paris; Pierre Druilhe, Saint Mande; Odile Puijalon-Mercereau, Issy Les Moulineaux, and Gordon Langsley, Paris, all of France, assignors to Institut Pasteur, France

Division of Ser. No. 275,139, Oct. 6, 1988. This application Jun. 5, 1995, Ser. No. 463,512
Claims priority, application France, Feb. 9, 1987, 87 01543
Int. Cl.[6] C01N *33/569;* **C07K** *16/20*
U.S. Cl. 435—7.22 **19 Claims**

1. An isolated or antibody which specifically, binds to a *P. falciparum* polypeptide, antigen comprising an amino acid sequence selected from the group consisting of:

Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg

Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu

Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala

Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys

Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu

Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys

Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu

Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln

Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu

Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln

Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln

Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser

Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp

Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu

Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu

Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln

Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Glu-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Leu

Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg

Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu

Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala

Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys

Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu

Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys

Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu

Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln

Gln-Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly

Gln-Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln

Ser-Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln

Asp-Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser

Leu-Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp

Glu-Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu

Gln-Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu

Glu-Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln

Arg-Leu-Ala-Lys-Glu-Lys-Leu-Gln-Gly-Gln-Gln-Ser-Asp-Leu-Glu-Gln-Leu

wherein said polypeptide induces antibodies that react with the schizont stage of *Plasmodium falciparum*, and wherein said polypeptide does not react with antibodies to the blood or sporozoite stages of *Plasmodium falciparum*.

5,589,344

TEST KIT AND METHOD FOR COMPETITIVE SPECIFIC BINDING ASSAY

Paul B. Contestable, and Brian A. Snyder, both of Rochester, N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Filed Jun. 15, 1994, Ser. No. 259,942
Int. Cl.[6] G01N *33/53;33/543*
U.S. Cl. 435—7.9 **14 Claims**

1. A specific binding method for the detection of a target specific binding ligand comprising the steps of:

A) bringing together, in any order:

1) a fluid sample suspected of containing a target specific binding ligand,

2) an immobilized first receptor for said target specific binding ligand, and

3) a water-soluble conjugate of said target specific binding ligand and a reporter enzyme,

to form a mixture containing a water-insoluble complex between said first receptor and said conjugate,

B) separating said water-insoluble complex of said first receptor from any uncomplexed water soluble conjugate,

C) bringing together a sample of said uncomplexed water-soluble conjugate, and an immobilized second receptor, wherein said second receptor is specific for said reporter enzyme, and further wherein said second receptor inhibits the activity of said reporter enzyme by less than 20%,

to form a water-insoluble reaction product of said immobilized second receptor and any uncomplexed water-soluble conjugate,

D) separating said water insoluble reaction product formed in step C) from any unreacted water-soluble conjugate, and

E) detecting any signal generated from said separated water-insoluble reaction product as a determination of said target specific binding ligand in said fluid sample.

5,589,345

CULTURES OF PERMANENT LINES OF HUMAN PROMYELOCYTIC CELLS AND THEIR USES FOR THE SCREENING OF MOLECULES UTILIZABLE IN PARTICULAR IN THE TREATMENT OF LEUKEMIAS

Michel Lanotte, and Roland Berger, both of Paris, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

PCT No. PCT/FR92/00173, § 371 Date Dec. 17, 1993, § 102(e) Date Dec. 17, 1993, PCT Pub. No. WO92/14815, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 25, 1992, Ser. No. 108,587
Claims priority, application France, Feb. 25, 1991, 91 02229
Int. Cl.[6] G01N *33/574;* **C12N** *5/08*
U.S. Cl. 435—7.23 **4 Claims**

4. A kit for a method for in vitro screening of acute human promyelocytic leukemia utilizing an NB4 cell line as a positive control, wherein the cell line NB4 was deposited with the Collection Nationale de Culture de Micro-organismes de l'INSTITUT PASTEUR (CNCM) on Feb. 25, 1991 under accession number I-1045, and with the Deutsche Sammlung von Mikro-organismen und Zellkulturen GmbH (DSM) on Feb. 14, 1992 under accession number DSM.ACC.2030, said kit comprising:

(a) an NB4 cell line; and

(b) a reagent suitable for detection of cellular differentiation.

5,589,346

METHOD OF MONITORING MARKERS OF BONE METABOLISM

Paul G. Kanan, Laguna Niguel, Calif.; Richard H. Smith, Ann Arbor, Mich., and Ellen Rudnick, Deerfield, Ill., assignors to BioQuant, Inc., Irvine, Calif.

Filed Jun. 21, 1994, Ser. No. 263,137
Int. Cl.[6] G01N *33/543*
U.S. Cl. 435—7.92 **8 Claims**

1. A method of monitoring bone metabolism comprising continuously collecting a sweat sample from a subject and assaying the sweat sample to determine the concentration of pyridinoline in the sample.

5,589,347

MULTILAYER ANALYSIS ELEMENTS FOR THE DETERMINATION OF TOTAL CHOLESTEROL

Fuminori Arai, and Takeshi Igarashi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 128,758, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 600,289, Oct. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 133,980, Dec. 17, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 461,766
Claims priority, application Japan, Dec. 18, 1986, 61-302325
Int. Cl.[6] C12Q *1/60;1/44;* **C12N** *11/00;* **G01N** *33/92*
U.S. Cl. 435—11 **26 Claims**

1. A multilayer analysis element for determination of total cholesterol comprising a light-transmissive water-impermeable support, at least one hydrophilic polymer layer provided on said support and a spreading layer provided on said hydrophilic polymer layer(s), and containing in one or more of said layers:

(a) at least one enzyme having cholesterol esterase activity,

(b) cholesterol oxidase,

(c) peroxidase,

(d) a colorimetric reagent composition, which in the presence of hydrogen peroxide and said peroxidase, produces a color change;

(e) at least one bile acid compound selected from the group consisting of bile acids, bile acid derivatives and salts of said acids and derivatives, and

(f) an alkyl phenoxy polyethoxy ethanol containing a polyoxyethylene chain composed of 30 to 60 oxyethylene units, wherein the alkyl group in said alkyl phenoxy polyethoxy ethanol is a linear or branched alkyl group having 7 to 10 carbon atoms.

5,589,348

IN SITU NICOTINAMIDE COENZYME GENERATING SYSTEM FOR ENZYME BASED CLINICAL CHEMISTRY ASSAYS

Richard A. Kaufman, Belleville; John M. Konopka, Westfield; Henry J. Rosenfeld, Florham Park, and Janine E. Sabo, Lodi, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 67,415, May 25, 1993, abandoned, which is a continuation of Ser. No. 930,494, Aug. 14, 1992, abandoned, which is a continuation of Ser. No. 800,654, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 447,337, Dec. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 399,052, Aug. 28, 1989, abandoned. This application Mar. 22, 1994, Ser. No. 216,231
Int. Cl.[6] C12Q *1/32;* **C12P** *17/02*
U.S. Cl. 435—26 **27 Claims**

1. In an enzymatic method for determining the concentration of an analyte in a body fluid sample by measuring the change in absorbance of a reaction mixture containing said sample, the change in absorbance due to oxidation of a reduced nicotinamide coenzyme in the reaction mixture, comparing the change in absorbance with the analyte to the change in absorbance with standards

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which calibrate for reaction conditions and calculating the concentration of said analyte, the improvement comprising generating a reduced nicotinamide coenzeyme in situ by mixing the body fluid sample, an oxidized nicotinamide coenzyme, a substrate is a molar mount equal to or less than the molar amount of the oxidized nicotinamide coenzyme added, and an enzyme specific for said substrate, such that the reduced nicotinamide coenzyme is generated in situ from the oxidized coenzyme by reaction of said substrate with the substrate specific enzyme, the substrate specific enzyme being present in an amount such that the in situ generation of the reduced nicotinamide coenzyme occurs at a rate equal to or greater than reoxidation of the reduced coenzyme by an analyte specific enzyme.

5,589,349

METHOD FOR ENZYMATIC ANALYSIS AND REAGANT THEREFOR

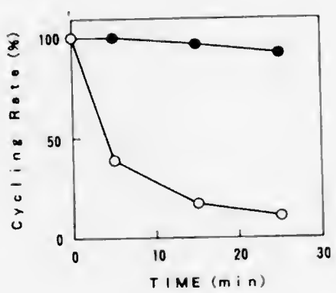
Akihiro Shinzaki; Miwa Watanabe, and Tadao Suzuki, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Continuation of Ser. No. 32,263, Mar. 17, 1993, abandoned. This application Nov. 3, 1994, Ser. No. 335,975

Claims priority, application Japan, Mar. 17, 1992, 4-060743; Nov. 9, 1992, 4-298924

Int. Cl.[6] C12Q *1/32;1/00;* **G01N** *33/53;33/48*

U.S. Cl. 435—26 **4 Claims**



1. A method of enzymatic analysis of a sample containing NAD or NADH, which comprises conducting enzymatic cycling of NAD-NADH interconversions in the presence of a dehydrogenase, a substrate for the dehydrogenase, a tetrazolium dye and a diaphorase, and detecting an amount of the NAD or NADH with a color-development signal of formazan which is produced by reduction of the tetrazolium dye by the action of the diaphorase and NADH-NAD conversions, wherein the dehydrogenase is alcohol dehydrogenase derived from microorganisms belonging to *Zymomonas*.

5,589,350

TESTING DEVICE FOR LIQUID AND LIQUID SUSPENDED SAMPLES

Barry Bochner, Alameda, Calif., assignor to Biolog, Inc., Hayward, Calif.

Continuation of Ser. No. 462,443, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 972,625, Nov. 6, 1992, abandoned. This application Jan. 11, 1996, Ser. No. 584,989

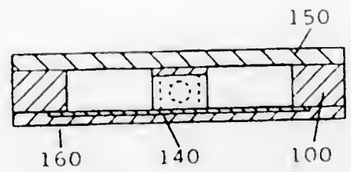
Int. Cl.[6] C12Q *1/02;* **C12M** *1/18*

U.S. Cl. 435—29 **8 Claims**

1. A method for testing samples comprising:

(a) providing a sample in liquid form;

(b) providing a sample delivering means;



(c) providing a device comprising: i) a housing, ii) a testing region comprising a plurality of test wells contained within said housing, iii) a liquid receiving means at an external surface of said housing, iv) a liquid flow-directing means providing liquid communication between said test wells of said testing region and said liquid receiving means, and v) a single gas-venting, liquid barrier having an inner and outer surface wherein said inner surface is in fluidic communication with said test wells of said testing region;

(d) delivering, internal to said housing, said sample via said sample delivering means to said testing region, such that said liquid enters said device at said liquid receiving means under positive pressure and the air in said device is vented through said gas-venting liquid barrier, wherein said positive pressure is greater than 1 pound per square inch; and

(e) attaching a non-venting material to said outer surface of said gas-venting barrier, such that said device is sealed.

5,589,351

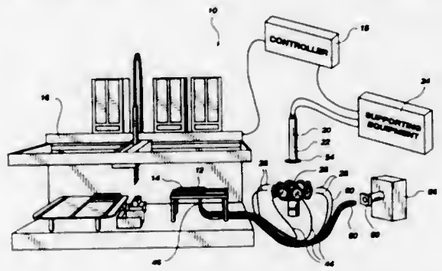
FLUORESCENCE DETECTION APPARATUS

Alec T. Harootunian, Salt Lake City, Utah, assignor to NPS Pharmaceuticals, Inc., Salt Lake City, Utah

Filed Dec. 6, 1994, Ser. No. 350,232

Int. Cl.[6] C12Q *1/02*

U.S. Cl. 435—29 **21 Claims**



1. An apparatus for detecting light transmitted from a composition disposed in one of a plurality of sample wells, said apparatus comprising:

a single light detector;

a reflector comprising means for selectively receiving light from any one of a plurality of detection emitters positioned about said reflector and of reflecting light toward said light detector; and

a plurality of detection carriers, each of said detection carriers comprising means for carrying light from one of the wells to one of said detection emitters.

5,589,352

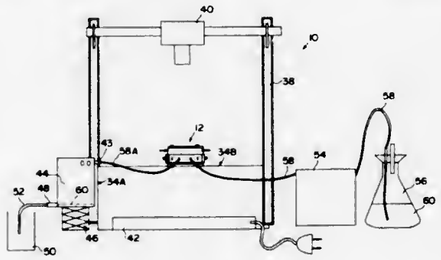
DIFFUSION GRADIENT CHAMBER SYSTEM

John A. Breznak; David Emerson, both of East Lansing, and John K. Koh, Ann Arbor, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, and Koh Development, Inc., Ann Arbor, both of Mich.

Continuation of Ser. No. 117,222, Sep. 3, 1993. This application Jun. 6, 1995, Ser. No. 466,758

Int. Cl.[6] C12Q *1/02;1/04;* **C12M** *3/00;1/00*

U.S. Cl. 435—34 **34 Claims**



1. An apparatus which functions for recording observations of microorganisms in an environment by providing a diffusion gradient in the environment which comprises:

(a) a chamber having a space which supports a semi-solid nutrient medium for microorganism growth, wherein the chamber has spaced apart transparent walls and sidewalls defining a space between the walls;

(b) at least two reservoirs mounted on the chamber for a liquid transport medium to be provided in the chamber each reservoir with an opening into the space in the chamber through an opening into the chamber, wherein the reservoirs are removably mounted on the chamber;

(c) a diffusion membrane mounted between the opening in the reservoir and the opening in the chamber at a height so that the membrane is covered by the semi-solid nutrient medium wherein the diffusion membrane allows a molecule in the transport medium through the opening in the reservoirs, the diffusion membrane and the opening in the chamber into the semi-solid nutrient medium to establish the diffusion gradient of the molecule in the chamber for the microorganism wherein one of the reservoirs can serve as a sink to receive the molecule moving from the semi-solid nutrient medium out of the diffusion gradient;

(d) an inlet into and an outlet from each of the reservoirs for flow of the liquid transport medium;

(e) a supply means for supplying the liquid transport medium to the inlet to each of the reservoirs;

(f) an effluent means for receiving the transport medium from the outlet of each of the reservoirs without destroying the diffusion gradient of the molecule in the semi-solid nutrient medium;

(g) enclosed housing means defining an enclosure and supporting the chamber on an outside portion of the housing means and including a light source inside the housing means for illuminating the chamber through the transparent walls; and

(h) recorder means for providing a picture of an activity of the microorganisms over a time span on the nutrient medium as an analyte in the liquid transport medium is fed into the nutrient medium in the space in the chamber through the membrane from each of the reservoirs.

5,589,353

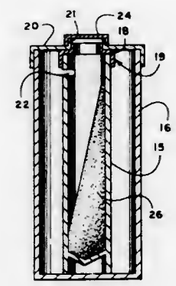
METHOD AND APPARATUS FOR THE SELECTIVE DETERMINATION OF FERMENTATIVE CULTURED ACTIVITIES

D. Roy Cullimore, 3303 Grant Road, Regina, Saskatchewan, Canada, and George W. Alford, 1954 Old Daytona Rd., Daytona Beach, Fla. 32014

Filed May 25, 1995, Ser. No. 450,420

Int. Cl.[6] C12Q *1/04;* **C12M** *3/00*

U.S. Cl. 435—34 **12 Claims**



8. A method for testing a sample for the presence of a targeted microorganism, said method comprising the steps of placing said sample into a culture chamber, placing a test chamber within said culture chamber, said test chamber having a culture medium therein, and having a window in the wall thereof, capping said test chamber and said culture chamber, and inverting said test chamber and culture chamber so that at least some of said sample will pass through said window and into said test chamber, and manipulating said test chamber and culture chamber so that said sample flows onto said culture medium.

5,589,354

HALOGENATION OF CEPHALEXIN WITH HALOPEROXIDASE FROM *RATHAYIBACTER BIOPURESIS*

Bing L. Wong, Durham, N.H.; Yong-Qiang Shen, Revere, Mass., and Yung-Pin Chen, Columbia, S.C., assignors to Biopure Corporation, Cambridge, Mass.

Filed Dec. 20, 1994, Ser. No. 360,149

Int. Cl.[6] C12P *35/00;* **C12N** *9/02;1/20*

U.S. Cl. 435—47 **4 Claims**

1. A method for producing a halogenated cephalexin comprising incubating cephalexin in an aqueous environment with hydrogen peroxide and a protein extract from *Rathayibacter biopuresis* having cephalexin haloperoxidase activity under conditions such that said halogenated cephalexin is produced and recovered.

5,589,355

PROCESS FOR PRODUCING RIBOFLAVIN

Satoshi Koizumi; Yoshiyuki Yonetani, and Sadao Teshiba, all of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Continuation of Ser. No. 161,394, Dec. 6, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 465,795

Claims priority, application Japan, Dec. 7, 1992, 4-326578

Int. Cl.[6] C12P *25/00;* **C12N** *1/21;15/52;15/63*

U.S. Cl. 435—66 **6 Claims**

1. An isolated DNA fragment which comprises a DNA having the nucleotide sequence set forth in SEQ ID NO:2.

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5,589,356

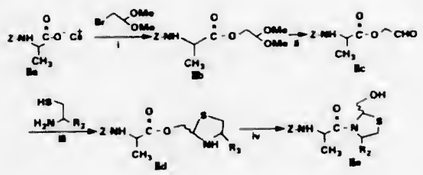
LITIGATION OF SIDECHAIN UNPROTECTED PEPTIDES VIA A MASKED GLYCOALDEHYDE ESTER AND O,N-ACYL REARRANGEMENT

James P. Tam, Nashville, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Filed Jun. 21, 1993, Ser. No. 81,412

Int. Cl.[6] C12P *21/06;* **C07K** *1/00;1/107*

U.S. Cl. 435—68.1 **12 Claims**



Scheme II.
I. DMF, 60-70°C, 24 h; II. 30% TFA in CH_2Cl_2 (2-5% H_2O); III. H_2O/CH_3CN, pH2-5; IV. pH6-8.

1. A method of chemically ligating a C-terminal carboxylic group or a first peptide and an N-terminal amino group of a second peptide, said method comprising:

a) introducing a masked aldehyde ester which is a glycolaldehyde ester into said carboxylic group of said first peptide;

b) converting said masked aldehyde ester to its corresponding free aldehyde ester on said carboxylic group of said first peptide;

c) reacting said free aldehyde ester with the N-terminal amino group of said second peptide whose amino terminal residue moiety is β-functionalized with —SH, —OH, —CO—NH_2, indole or imidazole to form a ring structure with said aldehyde on said first peptide and the N-terminal amino acid of said second peptide; and

d) intramolecular-acyl rearranging said carboxylic group and said amino group such that said carboxylic group and said amino group form an amide bond.

5,589,357

MILK PROTEIN PARTIAL HYDROLYSATE AND PROCESS FOR PREPARATION THEREOF

Sarah B. Martinez; H. Lee Leary, Jr., and Debra J. Nichols, all of Evansville, Ind., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Division of Ser. No. 85,213, Jun. 30, 1993. This application Nov. 21, 1994, Ser. No. 342,977

Int. Cl.[6] C12P *21/06*

U.S. Cl. 435—68.1 **6 Claims**

1. A process for preparing a partial hydrolysate of a protein mixture comprising whey protein and casein, said process comprising:

(a) performing a pretreatment step comprising heating the protein mixture at about 75° C. to about 85° C. for about 10 minutes to about 30 minutes;

(b) contacting the protein mixture resulting from step (a) with an enzyme mixture comprising at least 1800 USP Trypsin Units/mg and at least 350 USP Chymotrypsin Units/mg in an aqueous suspension wherein the ratio in USP units of Trypsin to Chymotrypsin is about 1.3 to about 18, at a temperature of about 30° C. to about 50° C., a pH of about 6.5 to about 8.0, for about 2 to about 6 hours, and;

(c) inactivating the enzyme mixture.

5,589,358

ILEAL BILE ACID TRANSPORTER COMPOSITIONS AND METHODS

Paul A. Dawson, 2111 Carriage Way, Chapel Hill, N.C. 27514

Filed Dec. 29, 1993, Ser. No. 176,126

Int. Cl.[6] C12N *15/12*

U.S. Cl. 435—69.1 **22 Claims**

1. An isolated DNA segment wherein said segment encodes a mammalian ileal/renal bile acid cotransporter having an amino acid sequence in accordance with seq id no:2 or seq id no:4.

5,589,359

CHIMERIC PROTEINS

Michael A. Innis, Moraga, and Abla A. Creasey, Piedmont, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Aug. 5, 1994, Ser. No. 286,521

Int. Cl.[6] C12N *15/15;15/63;* **A61K** *38/00;* **C07K** *14/81;14/745;* **C12P** *21/02;* **A61K** *38/57;38/36*

U.S. Cl. 435—69.2 **38 Claims**

1. A chimeric protein comprising:

(a) a Kunitz-type domain 1 of Tissue Factor Pathway Inhibitor (TFPI)-2, and

(b) a Kunitz-type domain 2 of Tissue-Factor Pathway Inhibitor (TFPI); or

(c) a Kunitz-type domain 1 of TFPI, and

(d) a Kunitz-type domain 2 of TFPI-2.

5,589,360

POLYPEPTIDE, DNA FRAGMENT ENCODING THE SAME, DRUG COMPOSITION CONTAINING THE SAME AND PROCESS FOR PRODUCING THE SAME

Hideaki Morishita; Toshinori Kanamori, and Masahiro Nobubara, all of Tokyo, Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 972,387, Nov. 5, 1992, Pat. No. 5,451,659. This application Apr. 28, 1995, Ser. No. 431,412

Claims priority, application Japan, Nov. 8, 1991, 3-293472; May 12, 1992, 4-119289

Int. Cl.[6] C12P *21/06;* **C12N** *1/20;* **C07H** *19/00;21/00*

U.S. Cl. 435—69.1 **13 Claims**

```
S 3 3
 5'  AGCTTAAAAA AGGGTATAAA ATAAAATGAA  AC
        ATTTTT TCCCATATTT TATTTTTACTT  TGTTTCATGA   5'
                                                S 3 4

S 3 5
 5'  AAAGTACTAT TGCACTGGCA CTCTTACCGT TACTGTTT
            TA ACGTGACCGT GAGAATGGCA ATGACAAA TGGGGA   5'
                                                S 1 8

S 1 9
 5'  ACCCCTGTGA CAAAAGCCGA CTCCCTAGGT CG
            CACT GTTTTCGGCT GAGGGATCCA GC   5'
                                        S 2 0
```

1. An isolated DNA molecule which comprises a nucleotide sequence encoding a polypeptide consisting of a polypeptide having an amino acid sequence as recited in SEQ. I.D. NO. 67, wherein the amino acid sequence as recited in SEQ. I.D. NO. 67 is substituted by at least one substitution selected from the substitutions (i) to (iii);

(i) substitution of Arg at residue 7, counting from the amino-terminus by an amino acid selected from the group consisting of Ala, Asp, Asn, Gln, Leu, Glu and Ser,

(ii) substitution of Gln at residue 15, counting from the amino-terminus by an amino acid selected from the group consisting of Arg and Lys, and

(iii) substitution of Tyr at residue 42, counting from the amino-terminus by an amino acid selected from the group consisting of Asp, and Glu;

wherein said polypeptide optionally has an amino-terminal peptide having an amino acid sequence selected from the group consisting of;

Asp-Asp-Ala-Ala-, Thr-Val-Ala-Ala-, Val-Ala-Ala-, Ala-Ala-, and Ala-; and

wherein said polypeptide optionally has a carboxy-terminal peptide having an amino acid sequence selected from the group consisting of;

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-Leu-Leu-Arg-Phe-Ser-Asn,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-Leu-Leu-Arg-Phe-Ser-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-Leu-Leu-Arg-Phe-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-Leu-Leu-Arg-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-Leu-Leu-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-Glu-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-Glu-,

Gly-Val-Pro-Gly-Asp-Gly-Asp-,

Gly-Val-Pro-Gly-Asp-Gly-, Gly-Val-Pro-Gly-Asp-,

Gly-Val-Pro-Gly-, Gly-Val-Pro-, Gly-Val-, and Gly-.

5,589,361

HUMAN TISSUE-TYPE PLASMINOGEN ACTIVATOR VARIANT

Adair J. Hotchkiss, Half Moon Bay; John V. O'Connor, San Carlos, and Michael W. Spellman, San Bruno, all of Calif., assignors to Genentech, Inc., San Bruno, Calif.

Continuation of Ser. No. 118,098, Nov. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 21,893, Mar. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 841,075, Mar. 18, 1986, abandoned. This application Sep. 10, 1990, Ser. No. 581,189

Int. Cl.[6] A61K *38/49;* **C12N** *15/58*

U.S. Cl. 435—69.1 **2 Claims**

1. A method for producing a human tissue-type plasminogen activator comprising transforming with DNA encoding said plasminogen activator variant mammalian host cell lacking N-acetylglucosamine aminotransferase, culturing the transformed cell, and recovering said variant from a culture of the cells.

5,589,362

TETRACYCLINE REGULATED TRANSCRIPTIONAL MODULATORS WITH ALTERED DNA BINDING SPECIFICITIES

Hermann Bujard, Heidelberg; Manfred Gossen, El Cerrito; Wolfgang Hillen, Erlangen; Vera Helbl, Fuerth, and Dirk Schnappinger, Bad Driburg, all of Germany, assignors to BASF Aktiengesellschaft, and Knoll Aktiengesellschaft, both of Ludwigshafen, Germany

Continuation-in-part of Ser. No. 383,754, Feb. 3, 1995, and a continuation-in-part of Ser. No. 275,876, Jul. 15, 1994, and a continuation-in-part of Ser. No. 260,452, Jun. 14, 1994, and a continuation-in-part of Ser. No. 76,726, Jun. 14, 1993, Pat. No. 5,464,758, said Ser. No. 275,876is a continuation-in-part of Ser. No. 270,637, Jul. 1, 1994, abandoned, said Ser. No. 260,452is a continuation-in-part of Ser. No. 76,327, Jun. 14, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 485,971

Int. Cl.[6] C12P *21/00;* **C12N** *15/31;* **C07H** *21/04*

U.S. Cl. 435—69.1 **20 Claims**

1. An isolated nucleic acid molecule encoding a fusion protein which regulates transcription, the fusion protein comprising a Tet repressor having at least one amino acid mutation that confers on the fusion protein an ability to bind a class B tet operator sequence having a nucleotide substitution at position +4 or +6, operatively linked to a polypeptide which regulates transcription in eukaryotic cells.

5,589,363

DNA ENCODING TISSUE FACTOR MUTANTS USEFUL FOR THE TREATMENT OF MYOCARDIAL INFARCTION AND COAGULOPATHIC DISORDERS

Soumitra Roy, San Francisco, and Gordon A. Vehar, San Carlos, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 714,819, Jun. 13, 1991. Pat. No. 5,346,991. This applicatioo May 20, 1994, Ser. No. 246,978

Int. Cl.[6] C07K *14/745;* **C12N** *1/13;15/12;15/63*

U.S. Cl. 435—69.6 **16 Claims**

1. An isolated substantially purified nucleic acid molecule encoding a tissue factor protein mutant molecule wherein either or both of the positively charged amino acid residues 165 and 166 are substituted with an α-amino acid other than one bearing a substantially positively charged sidechain at physiological pH.

5,589,364

RECOMBINANT PRODUCTION OF BIOLOGICALLY ACTIVE PEPTIDES AND PROTEINS

Jon I. Williams, Robbinsville, N.J.; James C. Pierce, Wilmington, Del.; G. Mark Anderson, Norristown, and Prasad Kari, Lansdale, both of Pa., assignors to Magainin Pharmaceuticals Inc., Plymouth Meeting, Pa.

Filed Jul. 29, 1994, Ser. No. 282,030

Int. Cl.[6] C12P *21/00*

U.S. Cl. 435—69.7 **39 Claims**

1. A method for recombinantly producing an antimicrobial amphiphilic, ion channel-forming peptide, comprising:

a. providing a protease-deficient microbial host transformed with an expression vector having DNA that encodes the peptide as a fusion protein under the control of a regulatory sequence operable in the microbial host; and

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b. expressing the peptide as a fusion protein in the transformed microbial host, wherein the peptide is expressed in soluble form.

5,589,365

PROCESS FOR PRODUCING GLYCOSYLATED INDOLOPYRROLOCARBAZOLE DERIVATIVES BY CULTURING CERTAIN MICROORGANISMS

Katsuhisa Kojiri; Hisao Kondo; Hiroharu Arakawa; Mitsuru Ohkubo, and Hiroyuki Suda, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 68,097, May 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 981,070, Nov. 24, 1992. This application Jan. 31, 1995, Ser. No. 381,286

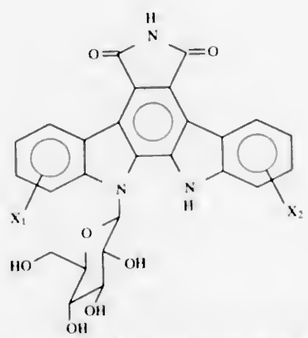
Claims priority, application Japan, Nov. 29, 1991, 3-341916; Jan. 9, 1992, 4-257306; Feb. 18, 1992, 4-69269; Dec. 14, 1992, 4-353623; Feb. 18, 1993, 5-053035

Int. Cl.[6] C12P *19/28*

U.S. Cl. 435—85 **7 Claims**

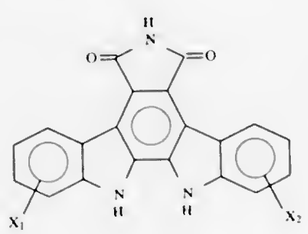
1. A process for preparation of a compound of the formula (VII)

(VII)



wherein X^1 and X^2 are each a hydroxyl group, which comprises culturing a microorganism selected from the group consisting of Microtetraspora sp. A34549, *Saccharothrix aerocolonigenes* ATCC 39243, and a mutant thereof, all of which have ability to glycosylate a compound represented by the formula

(VIII)



wherein X^1 and X^2 have the same meanings as defined above, in a nutrient medium containing the compound of formula (VIII), and recovering the compound represented by formula (VII) from the culture medium.

5,589,366

PROCESS FOR PRODUCING ANTIPARASITIC MACROLIDE ANTIBIOTICS

Mark A. Haxell, Broadstairs; David A. Perry, Sandwich, both of England; Hiroshi Maeda, Chita-Gun, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 378,997, Jan. 27, 1995, Pat. No. 5,492,928, which is a continuation of Ser. No. 703,578, May 20, 1991, abandoned, which is a continuation of Ser. No. 314,734, Feb. 23, 1989, abandoned. This application Nov. 9, 1995, Ser. No. 556,245

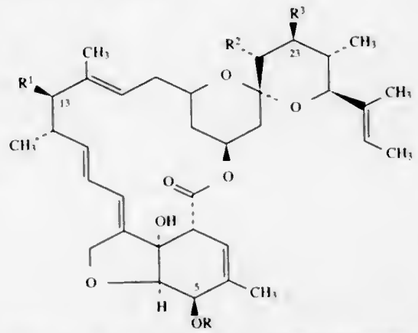
Claims priority, application United Kingdom, Feb. 25, 1988, 8804440

Int. Cl.[6] C07D *493/22*

U.S. Cl. 435—119 **6 Claims**

1. A process for producing compounds N787-182-1 to N787-182-12 of the formula (I)

(I)



wherein, for the respective compound specified, the substituents R, R^1, R^2 and R^3 are as follows:

COMPOUND	R	R^1	R^2	R^3
N787-182-1	CH_3	OH	OH	H
N787-182-2	H	OH	OH	$OCOCH(CH_3)_2$
N787-182-3	CH_3	OH	OH	$OCOCH(CH_3)_2$
N787-182-4	H	$OCOCH(CH_3)_2$	OH	H
N787-182-5	CH_3	$OCOCH(CH_3)_2$	OH	H
N787-182-6	H	$OCOCH(CH_3)_2$	OH	$OCOCH(CH_3)_2$
N787-182-7	CH_3	$OCOCH(CH_3)_2$	OH	$OCOCH(CH_3)_2$
N787-182-8	H	H	OH	$OCOCH(CH_3)_2$
N787-182-9	H	$OCOCH(CH_3)_2$	H	H
N787-182-10	CH_3	$OCOCH(CH_3)_2$	OH	$OCOCH(CH_3)_2$
N787-182-11	CH_3	H	OH	$OCOCH(CH_3)_2$
N787-182-12	CH_3	$OCOCH(CH_3)_2$	H	H

which comprises cultivating a microorganism having the identifying characteristics of Streptomyces sp ATCC 53718, or a mutant, genetically transformed or recombinant form thereof having the ability to produce one or more of the N787-182 compounds, in submerged aqueous or solid agar culture media containing an assimilable source of carbon, nitrogen and inorganic salts, under submerged aerobic fermentation conditions until a recoverable amount of said N787-182 compounds are obtained; and recovering said compounds.

5,589,367

RECOMBINANT PLANT VIRAL NUCLEIC ACIDS

Jon Donson, Davis, Calif.; William O. Dawson, Winter Haven, Fla.; George L. Granthan, Riverside, Calif.; Thomas H. Turpen, Vacaville, Calif.; Ann M. Turpen, Vacaville, Calif.; Stephen J. Garger, Vacaville, Calif., and Laurence K. Grill, Vacaville, Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.

Continuation of Ser. No. 923,692, Jul. 31, 1992, Pat. No. 5,316,931, which is a continuation-in-part of Ser. No. 600,244, Oct. 22, 1990, abandoned, Ser. No. 641,617, Jan. 16, 1991, abandoned, Ser. No. 737,899, Jul. 26, 1991, abandoned, and Ser. No. 739,143, Aug. 1, 1991, abandoned, said Ser. No. 600,244is a continuation of Ser. No. 310,881, Feb. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 160,766, Feb. 26, 1988, abandoned, and Ser. No. 160,771, Feb. 26, 1988, abandoned, said Ser. No. 641,617is a continuation of Ser. No. 347,637, May 5, 1989, abandoned, said Ser. No. 737,899is a continuation of Ser. No. 363,138, Jun. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 219,279, Jul. 15, 1988, abandoned. This application Jan. 19, 1994, Ser. No. 184,237

Int. Cl.[6] C12N *15/83;15/33;15/68*

U.S. Cl. 435—172.3 **9 Claims**

1. A recombinant plant viral nucleic acid comprising a native plant viral subgenomic promoter, at least one non-native plant viral subgenomic promoter and a plant viral coat protein coding sequence, wherein said native plant viral subgenomic promoter initiates transcription of the plant viral coat protein sequence and said non-native plant viral subgenomic promoter initiates transcription of an operably joined nucleic acid sequence in a host plant and wherein said non-native plant viral subgenomic promoter is incapable of recombination with any other subgenomic promoter of said recombinant plant viral nucleic acid and said recombinant plant viral nucleic acid is expressed systemically in a host plant.

5,589,368

METHOD FOR MAMMALIAN CELL TRANSFECTION

David H. Spear, Playa del Rey, and Peter A. Edwards, Los Angeles, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 899,745, Jun. 17, 1992, Pat. No. 5,330,904. This application Apr. 25, 1994, Ser. No. 232,717

Int. Cl.[6] C12N *15/00;1/00;1/13;* **C12Q** *1/68*

U.S. Cl. 435—172.3 **23 Claims**

12. A process for high-efficiency transfection of a mammalian cell culture comprising:

incubating a cell culture in the presence of a transfection medium comprising a serum and a calcium phosphate-DNA precipitate to produce a transfected cell culture, wherein the serum of the transfection medium is of a different type from the serum used to grow the cell culture.

5,589,369

CELLS HOMOZYGOUS FOR DISRUPTED TARGET LOCI

Jonathan G. Seidman, Milton, Mass., and Aya Jakobovits, Menlo Park, Calif., assignors to Cell Genesys Inc., Foster City, Calif., and The President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 833,992, Feb. 11, 1992, abandoned. This application May 31, 1994, Ser. No. 252,048

Int. Cl.[6] C12N *15/00;5/00*

U.S. Cl. 435—172.3 **11 Claims**

1. A method for making diploid mammalian cells homozygous for disrupted target loci, said method comprising:

a. introducing into diploid mammalian cells a construct, said construct comprising a selectable marker gene flanked by regions of sequence homology to said loci, wherein said marker gene is a non-amplifiable gene which confers on said cells a preferential ability to grow in a selective medium;

b. growing the cells obtained in step (a) in said selective medium at a first level of selective agent and analyzing viable cells to provide a population of cells which have undergone homologous recombination at one or both of the target loci;

c. subjecting the population of cells obtained in step (b) to a level of selective agent greater that said first level, whereby cells which have undergone homologous recombination at both loci are selected; and

d. isolating said cells obtained in step (c).

5,589,370

PROCESS FOR ENCAPSULATING SENSITIVE MATERIALS

Florencio Ratuiste, Union; Robert Ahart, Wayne, both of N.J.; David J. Lang, Ossining, N.Y., and Liang S. Tsaur, Norwood, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Aug. 1, 1995, Ser. No. 509,931

Int. Cl.[6] C12N *9/96;* **C11D** *17/08*

U.S. Cl. 264—4.3 **7 Claims**

1. An improved curing or hardening process for the continuous production of capsules containing an active material which active material is subject to loss of activity upon release in a cleaning product wherein said process comprises:

(a) mixing

(1) said active material subject to loss of activity; and

(2) a solution of a cross-linking polymer selected from the group consisting of

(a) nonionic water soluble polymers

(b) polysaccharides selected from the group consisting of carrageenan, guar gum, pectin, xanthan gum, partially hydrogenated cellulose acetate, hydroxy alkyl cellulose, alkyl cellulose and mixtures thereof:

(c) proteins: and

(d) mixtures thereof

into an atomizing device in which the components are atomized into droplets;

(b) spraying the droplets from said atomizing device onto a film of hardening liquid over a distance of at least 30 centimeters, wherein said liquid is cascading continuously down the wall of a closed vessel containing both said atomizing device and a source of hardening liquid;

(c) collecting hardened capsules formed when the droplets and hardening liquid are contacted and filtering the capsules from the hardening liquid; and

(d) recirculating the recovered hardening liquid to the top of said closed vessel where it cascades and contacts the droplets to form additional capsules.

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5,589,371

HUMAN MANGANESE SUPEROXIDE DISMUTASE (HMN-SOD)

Konrad Heckl, Heidelberg, Germany; Walter Spevak, Stockerau, Austria; Elinborg Ostermann, Wien, Austria; Andreas Zöphel, Neulengbach, Austria; Edeltraud Krystek, Wien, Austria; Ingrid Maurer-Fogy, Wien, Austria; Maria J. Wiche-Castanon, Wien, Austria; Christian Stratowa, Wien, Austria, and Rudolf Hauptmann, Ebreichsdorf, Austria, assignors to Boehringer Ingelheim International GmbH, Germany

Continuation of Ser. No. 945,240, Sep. 15, 1992, Pat. No. 5,436,162, which is a continuation of Ser. No. 167,261, Mar. 11, 1988, Pat. No. 5,240,847. This application Mar. 30, 1995, Ser. No. 413,367

Claims priority, application Germany, May 26, 1900, 37 17 695.1; Mar. 14, 1987, 37 08 306.6; Jul. 10, 1987, 37 22 884.6; Dec. 24, 1987, 37 44 038.1

Int. Cl.[6] C12N *9/02*

U.S. Cl. 435—189 **2 Claims**

1. A method for the preparation of tetrameric human manganese superoxide dismutase (hMn-SOD)consisting of 198 amino acids, comprising

(a) obtaining a yeast host transformed with a yeast expression vector comprising a cloned gene encoding hMn-SOD consisting of 198 amino acids;

(b) cultivating said yeast host under conditions which result in the expression of tetrameric hMn-SOD: and

(c) isolating said tetrameric hMn-SOD.

5,589,372

SQUALENE SYNTHETASE

Gordon W. Robinson, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 911,835, Jul. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 588,235, Sep. 26, 1990, abandoned. This application Dec. 8, 1994, Ser. No. 351,981

Int. Cl.[6] C12N *1/21;5/10;15/54;15/63*

U.S. Cl. 435—193 **20 Claims**

1. An isolated nucleic acid molecule comprising a sequence coding for the amino acid sequence of FIGS. 2, 8, or 9 (SEQ ID NOS. 2, 4, or 6).

5,589,373

THERMOSTABLE ALKALINE METALLOPROTEASE PRODUCED BY A HYPHOMONAS AND PREPARATION THEREOF

Ronald M. Weiner, Adelphi; Juan Shi, College Park, both of Md., and Vernon E. Coyne, Lakeside, South Africa, assignors to University of Maryland at College Park, College Park, Md.

Continuation of Ser. No. 104,847, Aug. 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,808

Int. Cl.[6] C12N *9/52;15/57;15/70;1/22*

U.S. Cl. 435—220 **28 Claims**

1. A native purified thermostable alkaline metalloprotease of *Hyphomoms jannaschiana* having the following properties:

a) an optimal activity at a pH of approximately 9.5 at a reaction temperature of about 60° to 65° C.;

b) lack of inhibition by 60 mM phenylmethyl sulfonamide fluoride (PMSF); and

c) a molecular weight of approximately 80,000 daltons.

5,589,374

DIABETOGENE RAD: A TYPE II DIABETES SPECIFIC GENE

C. Ronald Kahn, West Newton, and Christine Reynet, Boston, both of Mass., assignors to Joslin Diabetes Center, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 901,710, Jun. 19, 1992, abandoned. This application Jun. 11, 1993, Ser. No. 76,089

Int. Cl.[6] C12N *15/55;15/63;9/16*

U.S. Cl. 435—240.1 **8 Claims**

2. A vector comprising a DNA sequence encoding human rad.

5,589,375

PTP 1D: A NOVEL PROTEIN TYROSINE PHOSPHATASE

Axel Ullrich, Martinsried bei Muchen, and Wolfgang Vogel, Germering, both of Germany, assignors to Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E. V., Gottingen, Germany

Continuation-in-part of Ser. No. 956,315, Oct. 6, 1992, abandoned. This application Feb. 16, 1993, Ser. No. 18,129

Int. Cl.[6] C12N *5/06;* **C07H** *21/04*

U.S. Cl. 435—240.2 **10 Claims**

1. An isolated and purified nucleic acid molecule substantially free of nucleotide sequences with which the molecule is natively associated comprising a nucleotide sequence that (a) encodes the protein tyrosine phosphatase 1D amino acid sequence (SEQ ID No:5); or (b) which hydbridizes to the complement of the nucleotide sequence of (a).

5,589,376

MAMMALIAN NEURAL CREST STEM CELLS

David J. Anderson, Altadena, and Derek L. Stemple, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 920,617, Jul. 27, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 290,228

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.2 **10 Claims**

1. An isolated population of mammalian neural crest stem cells, wherein said cells are capable of self-renewal in a feeder cell-independent culture medium and capable of differentiation to peripheral nervous system neuronal or glial cells, wherein said neural crest stem cells express low-affinity nerve growth factor receptor (LNGFR) and nestin, but do not express glial fibrillary acidic protein (GFAP), wherein at least one of said isolated population is capable of differentiation to a peripheral nervous system neuronal cell that does not express LNGFR or nestin but does express neurofilament-160, and wherein at least one cell of said isolated population is capable of differentiation to a peripheral nervous system glial cell that expresses LNGFR, nestin and GFAP.

5,589,377

RECOMBINANT ADENO-ASSOCIATED VIRUS VECTORS

Jane S. Lebkowski, Portola Valley; Maureen A. McNally, and Thomas B. Okarma, both of Palo Alto, all of Calif., assignors to Rhône-Poulenc Rorer Pharmaceuticals, Inc., Collegeville, Pa.

Continuation of Ser. No. 236,642, May 2, 1994, abandoned, which is a division of Ser. No. 993,776, Dec. 21, 1992, Pat. No. 5,354,678, which is a continuation-in-part of Ser. No. 605,775, Oct. 30, 1990, Pat. No. 5,173,414. This application Jun. 6, 1995, Ser. No. 490,095

Int. Cl.[6] C12N *5/10;7/01;15/86*

U.S. Cl. 435—240.2 **8 Claims**

1. A rep/cap vector, wherein said vector is a recombinant adenovirus or herpes virus which comprises adeno-associated virus rep and cap genes, and said adenovirus or herpes virus retains helper functions sufficient to permit adeno-associated virus replication.

5,589,378

Patent Not Issued For This Number

5,589,379

GEMINIVIRUS-BASED GENE EXPRESSION SYSTEM

Jean C. Kridl; George Bruening, both of Davis, and Vic C. Knauf, Winters, all of Calif., assignors to Calgene, Inc., Davis, Calif.

Continuation of Ser. No. 42,103, Apr. 2, 1993, abandoned, which is a continuation of Ser. No. 24,164, Feb. 26, 1993. This application May 23, 1994, Ser. No. 248,859

The portion of the term of this patent subsequent to Feb. 26, 2013, has been disclaimed.

Int. Cl.[6] C12N *5/04;15/34;15/82;15/83;15/84*

U.S. Cl. 435—240.4 **18 Claims**

1. A geminivirus transfer vector comprising a plant geminivirus genome wherein the coding sequence for the coat protein gene in said genome is deleted and replaced with a first multiple cloning site and wherein the transcriptional initiation region of the geminivirus transacting factor gene in said genome is replaced with a DNA sequence comprising a transcriptional initiation region of a gene which is expressed other than constitutively in one or more plant cells.

8. A plant cell comprising a geminivirus transfer vector of claim 1.

5,589,380

ISOLATED DNA MOLECULE ENCODING SHET1 OF *SHIGELLA FLEXNERI* 2A AND MUTANT *SHIGELLA FLEXNERI* 2A

Alessio Fasano, Ellicott City; Myron M. Levine, Columbia; James P. Nataro, Catonsville, and Fernando Noriega, Columbia, all of Md., assignors to University of Maryland at Baltimore, Baltimore, Md.

Continuation-in-part of Ser. No. 160,317, Dec. 2, 1993, Pat. No. 5,468,639, which is a continuation-in-part of Ser. No. 894,774, Jun. 5, 1992, abandoned. This application Nov. 30, 1994, Ser. No. 351,147

Int. Cl.[6] C12N *1/20;* **C12P** *21/04;* **C07K** *1/00;* **C07H** *19/00*

U.S. Cl. 435—252.3 **8 Claims**

1. An isolated DNA molecule encoding ShET1 which consists of the amino acid sequence encoded by the DNA of SEQ ID NO:15.

5,589,381

***BACILLUS LICHENIFORMIS* PRODUCING ANTIFUNGAL AGENTS AND USES THEREOF FOR CONTROL OF PHYTOPATHOGENIC FUNGI**

Carlos A. Neyra, Kendall Park, and Lakshmi Sadasivan, Piscataway, both of N.J., assignors to Rutgers, The State University of New Jersey, Piscataway, N.J.

Filed Jun. 30, 1994, Ser. No. 268,922

Int. Cl.[6] C12N *1/20;* **A01N** *63/00*

U.S. Cl. 435—252.5 **12 Claims**

1. A method for biologically controlling a plant disease caused by a plant-colonizing fungus, which comprises inoculating a plant requiring disease control with an effective amount of a microbial inoculant comprising a microorganism having all of the identifying characteristics of *Bacillus licheniformis* strain PR1-36a, said inoculation resulting in the control of said plant disease.

5,589,382

***BACILLUS THURINGIENSIS* GENES ENCODING NEMATODE-ACTIVE TOXINS**

Jewel Payne, Davis; Kenneth E. Narva, and Jenny Fu, both of San Diego, all of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 310,197, Sep. 21, 1994, and Ser. No. 357,698, Dec. 16, 1994, which is a division of Ser. No. 176,403, Dec. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 999,053, Dec. 31, 1992, abandoned, said Ser. No. 310,197is a division of Ser. No. 92,155, Jul. 15, 1993, Pat. No. 5,350,577, which is a division of Ser. No. 918,345, Jul. 21, 1992, Pat. No. 5,270,448, which is a division of Ser. No. 558,738, Jul. 27, 1990, Pat. No. 5,151,363. This application Jun. 7, 1995, Ser. No. 485,568

Int. Cl.[6] C12N *1/20;* **A01N** *63/00*

U.S. Cl. 435—252.5 **8 Claims**

1. A polynucleotide sequence from a *Bacillus thuringiensis* isolate selected from the group consisting of PS80JJ1, PS158D5, PS167P, PS169E, PS177F1, PS177G, PS204G4, and PS204G6, which encodes a toxin active against nematodes.

5,589,383

PROTEASE DELETION

Alan Sloma, Watertown; Gerald A. Rufo, Jr., Burlington; Cathy F. Rudolph, Stoughton; Barbara J. Sullivan, Burlington, and Janice Pero, Lexington, all of Mass., assignors to Omnigene, Inc., Cambridge, Mass.

Division of Ser. No. 579,401, Sep. 7, 1990, which is a continuation-in-part of Ser. No. 396,521, Aug. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 347,428, May 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 273,423, Nov. 18, 1988, abandoned. This application Aug. 12, 1994, Ser. No. 285,477

Int. Cl.[6] C12N *1/21;9/54;15/57;15/75*

U.S. Cl. 435—252.31 **3 Claims**

1. An isolated and purified DNA molecule encoding a Bacillus residual protease 1 (bpr).

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5,589,384

FUSION PROTEINS

Martin J. Lipscombe, Cambridge; Ian G. Charles, and Neil F. Fairweather, both of Beckenham, all of United Kingdom, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 896,003, Jun. 11, 1992, abandoned. This application May 2, 1994, Ser. No. 237,716

Claims priority, application United Kingdom, Jun. 11, 1991, 9112553.4

Int. Cl.[6] **C12N** *15/61;1/00;1/21;15/63;* **C07K** *14/28;14/24*

U.S. Cl. 435—252.33 **25 Claims**

1. A fusion protein comprising the following elements linked in an N-terminal to C-terminal direction:

(A) sufficient of the B subunit of cholera toxin or heat-labile enterotoxin of *Escherichia coli* such that the fusion protein forms a pentamer complex and binds to GM_1-ganglioside;

(B) a hinge of from two to eight directly linked glycineproline repeats; and

(C) a predetermined antigen or epitope of a human or animal pathogen, which antigen or epitope effects an immune response.

5,589,385

CLONING OF THE BIOSYNTHETIC PATHWAY FOR CHLORTETRACYCLINE AND TETRACYCLINE FORMATION AND COSMIDS USEFUL THEREIN

Michael J. Ryan, West Milford; Jason A. Lotvin, Union, both of N.J.; Nancy Strathy, Monsey, N.Y., and Susan E. Fantini, Ridgewood, N.J., assignors to American Cyanamid Company, Wayne, N.J.

Continuation-in-part of Ser. No. 821,109, Jan. 15, 1992, abandoned, and Ser. No. 821,419, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 558,039, Jul. 26, 1990, abandoned, said Ser. No. 821,109is a continuation of Ser. No. 558,040, Jul. 26, 1990, abandoned. This application Sep. 22, 1993, Ser. No. 125,468

Int. Cl.[6] **C12N** *1/21;15/52;15/76*

U.S. Cl. 435—258.35 **13 Claims**

1. A purified and isolated nucleic acid molecule encoding the proteins of the biosynthetic pathway for tetracycline, chlortetracycline, 6-demethylchlortetracycline, demethyltetracycline, 7-chloro-5a, 11a-dehydrotetracycline or 2-decarboxamido-2-acetyltetracycline, wherein said nucleic acid molecule is isolated from an antibiotic-producing wild-type or mutant Streptomyces.

5,589,386

HYDROLYSIS OF CHOLINESTERASE INHIBITORS USING PARATHION HYDROLASE

Cuneyt M. Serdar, 1844 Rivendell Cir., Newbury Park, Calif. 91320

Continuation-in-part of Ser. No. 237,255, Aug. 26, 1988. This application Feb. 17, 1989, Ser. No. 312,503

Int. Cl.[6] **C12S** *13/00;* **C12N** *15/00;1/20;1/14*

U.S. Cl. 435—262.5 **4 Claims**

1. A method for the hydrolysis of a cholinesterase inhibitor comprising an organophosphate, said method comprising treating the cholinesterase inhibitor with a purified and isolated biologically active substance selected from the group consisting of mature parathion hydrolase and a methionine (−1) analog thereof, said parathion hydrolase having enhanced specific activity as a result of having been produced in a microorganism cultivated in a culture medium comprising greater than 0.15 mM but not more than 3.0 mM of a metal selected from the group consisting of cobalt, zinc and a mixture of cobalt and zinc.

5,589,387

METHOD FOR PREVENTING THE ACCUMULATION OF INORGANIC DEPOSITS ON CONTACT LENSES

Daniel P. Cafaro, Santa Ana, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 132,606, Oct. 6, 1993, Pat. No. 5,447,650. This application Jun. 6, 1995, Ser. No. 470,910

Int. Cl.[6] **C11D** *3/06;7/16*

U.S. Cl. 435—264 **15 Claims**

1. A method for preventing the accumulation of inorganic deposits on a contact lens comprising the step of treating the lens with a solution comprising

(A) hydrogen peroxide and

(B) a composition comprising

(i) at least one sequestering agent selected from the group consisting of sodium botogluconate and sodium gluconate and

(ii) a neutralizing system capable of reducing the hydrogen peroxide in an exothermic reaction producing heat at a temperature of at least 30° C. without external application of heat, thereby activating said sequestering agent wherein the lens is treated with the solution for a period of time sufficient to prevent the accumulation of inorganic deposits thereon.

5,589,388

HOT-COMPOSTING APPARATUS

Esko Hanhikoski, Leipurintie 9, FIN-00620 Helsinki, Finland

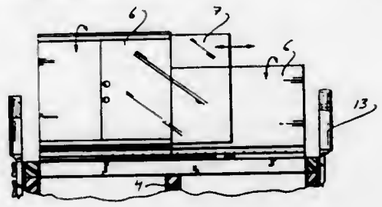
PCT No. PCT/FI93/00028, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/15033, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 29, 1993, Ser. No. 256,919

Claims priority, application Finland, Jan. 30, 1992, U920086

Int. Cl.[6] **C05F** *9/02*

U.S. Cl. 435—290.3 **9 Claims**



1. A hot-composting apparatus for household use comprising a drum having a geometric longitudinal axis, said drum comprising:

heat insulated casing wall having a polygonal form;

heat insulated gable walls, wherein the heat insulated casing walls and the heat insulated gable walls are constructed and arranged to provide an internal composting space, and the heat insulated gable walls are constructed and arranged to provide support for rotation about the geometric longitudinal axis of the drum;

an intermediate wall unit positioned in the composting space and which has a form corresponding substantially to the polygonal form of the drum, and which divides the drum into departments in a plane which is substantially perpendicular in relation to the geometric longitudinal axis of the drum, wherein the intermediate wall unit comprises at least one movable intermediate wall element which can be shifted in a direction along the geometric longitudinal axis of the drum to a location between the gable walls, and which is perforated to provide air defiles for conveying air from one composting department into another;

means for opening and closing the drum comprising a two part cover, which cover substantially forms one section of the casing wall;

shiftable plate elements provided under one part of the two part cover;

wherein the casing wall and the gable walls are substantially air-tight and heat insulated so that inner and outer surface layers are air-tight and a layer therebetween is heat insulated;

at least one gable wall includes an openable and closable air defile for conveying air in a sufficient amount to maintain microbe actions in the internal composting space; and

widths of parts of the cover in the direction of the geometric longitudinal axis of the drum are selected such that adjacent edges of the parts of the cover meet the intermediate wall unit when the intermediate wall unit is positioned in the middle of the drum.

5,589,389

APPARATUS FOR CAUSING MEDICINAL PRODUCTS TO PENETRATE INTO RED BLOOD CELLS

Etienne Pages; Claude Ropars, both of Saint-Avertin, and Christophe Bailleul, Montfermeil, all of France, assignors to Fondation Nationale de Transfusion Sanguine, Paris Cedex, France

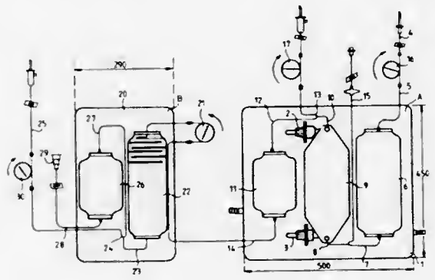
PCT No. PCT/FR92/00623, § 371 Date Jan. 3, 1994, § 102(e) Date Jan. 3, 1994, PCT Pub. No. WO93/00940, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 2, 1992, Ser. No. 170,352

Claims priority, application France, Jul. 3, 1991, 91 08302

Int. Cl.[6] **C12M** *1/12;3/06*

U.S. Cl. 435—306.1 **20 Claims**



1. An apparatus for introducing at least one biologically active substance into erythrocytes, comprising:

a settling bowl for removing plasma, leucocytes, platelets of blood, and adjusting hematocrit and controlling osmolarity of blood, and for obtaining erythrocytes suspended in a solution of a product to be internalized;

a lysis unit for cooling the erythrocyte suspension obtained from the settling bowl and introducing the active substance into the cooled erythrocyte suspension, the lysis unit having cooling means for maintaining the erythrocyte suspension at a temperature less than 10° C., a dialysis cartridge for receiving the cooled erythrocyte suspension and a first collection pouch for receiving the erythrocyte suspension processed by the dialysis cartridge, and means for introducing the active substance into the first pouch along with the processed erythrocyte suspension; and

a resealing unit for heating the erythrocyte suspension treated with the active substance from the first pouch and introducing a resealing product into the heated and treated erythrocyte suspension, the resealing unit having heating means for maintaining the temperature of the treated erythrocyte suspension greater than 20° C., a second collection pouch for receiving and holding the heated and treated erythrocyte suspension, and means for introducing the resealing product into the second pouch along with the heated and treated erythrocyte suspension.

5,589,390

VERMIN EXTERMINATING ELEMENT AND VERMIN EXTERMINATING METHOD

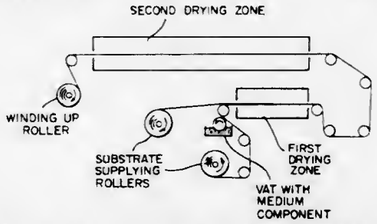
Toshio Higuchi; Yasuhiro Fukushima; Kenji Furumori; Kazuhiro Yamamoto, and Minoru Ouchi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 124,435, Sep. 22, 1993, abandoned, which is a continuation of Ser. No. 7,015, Jan. 21, 1993, abandoned, which is a continuation of Ser. No. 700,151, Jul. 11, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,840

Claims priority, application Japan, Sep. 11, 1989, 1-234969; Mar. 23, 1990, 2-74598

Int. Cl.[6] **C12N** *1/00;* **C12M** *1/00*

U.S. Cl. 435—307.1 **19 Claims**



19. A method for exterminating vermin which comprises applying a vermin exterminating element to a stem or branch of a tree from which vermin are to be exterminated, wherein said vermin exterminating element comprises a culture carrier which comprises nonwoven cloth or woven cloth impregnated with medium components for cultivating a microorganism, wherein a culture solution of a vermin infectious microorganism is impregnated together with the medium components, wherein said vermin exterminating element is dried after cultivating said vermin infectious microorganism, and said nonwoven or woven cloth has a thickness of 1.8 mm or more and has a base weight of at least 100 g/m^2.

5,589,391

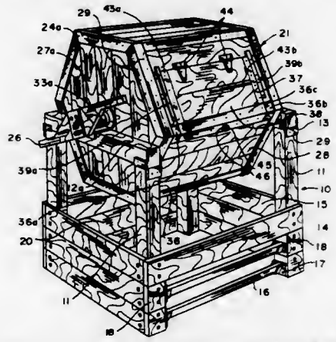
ROTATABLE COMPOSTING DEVICE

Thomas M. Fink, 6 Bassett Pl., Fairfield, Ohio 45014

Filed Dec. 21, 1993, Ser. No. 170,787

Int. Cl.[6] **C12M** *1/10*

U.S. Cl. 435—290.3 **17 Claims**



1. A composting device comprising, a support base unit, a hollow enclosed tumbler drum of polygonal shaped cross-section having sidewalls and endwalls, said drum comprising a unitary rigid polygonal shaped end frame surrounding each endwall and directly secured thereto, a plurality of discrete boards extending between and secured to the end frames to form the sidewalls of the drum, an angle corner covering and reinforcing member secured to said boards along the exterior of each corner of said polygonal shaped drum, a door in said drum for loading material into said

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drum, said drum being mounted on said base unit for rotation about a horizontal central longitudinal axis through the endwalls of the drum, wherein the support base unit is rectangular in plan and comprises upright corner leg members and wherein the leg members at opposite ends of the base unit are connected at their upper ends by a cross-member which supports a respective end of said drum, said sidewalls being constructed such that cracks are formed between each adjacent board whereby air may enter the drum.

5,589,392

NUCLEIC ACID CONSTRUCT ENCODING A NUCLEAR TRANSPORT PEPTIDE OPERATIVELY LINKED TO AN INDUCIBLE PROMOTER

Jay M. Short, Encinitas, Calif., assignor to Stratagene, La Jolla, Calif.

Continuation of Ser. No. 640,983, Jan. 14, 1991, abandoned. This application Nov. 29, 1993, Ser. No. 158,718

Int. Cl.[6] C12N *15/09;15/63;* **C07H** *21/02;21/04*

U.S. Cl. 435—320.1 **2 Claims**

1. A nucleic acid construct comprising a DNA sequence encoding a nuclear transport signal peptide operatively linked to a DNA sequence encoding an inducible repressor, where the nuclear transport signal peptide is from an SV40 large T antigen and the inducible repressor is a lac inducible repressor protein, and wherein said DNA sequences are operatively linked to a promoter.

5,589,393

METHOD FOR PREPARING A GLYCATED HEMOGLOBIN SOLUTION

Michael D. Fiechtner, Highland Park; John M. Ramp, Gurnee, both of Ill.; Barbara J. England, Milwaukee, Wis., and Mary J. Annino, Arlington Heights, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 717,558, Jun. 19, 1991, abandoned. This application Apr. 24, 1995, Ser. No. 427,508

Int. Cl.[6] G01N *33/96*

U.S. Cl. 436—15 **8 Claims**

1. A method for preparing a stable glycated hemoglobin solution useful as a calibrator or control in an assay for glycated hemoglobin comprising:

a. washing erythrocytes;
b. releasing hemoglobin from the erythrocytes into a solution;
c. removing lipids from the hemoglobin solution;
d. oxidizing the hemoglobin to met-hemoglobin;
e. converting the met-hemoglobin to azido-met-hemoglobin or cyano-met-hemoglobin; and
f. adding glucose to the azido-met-hemoglobin or cyano-methemoglobin to form glycated azido-met-hemoglobin or glycated cyano-met-hemoglobin.

5,589,394

CELL SUSPENSION PREPARATION APPARATUS AND METHOD

Young R. Kim, Sunnyvale; Kenneth E. Iles, Los Altos, and Roderick W. Larue, Sebastopol, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

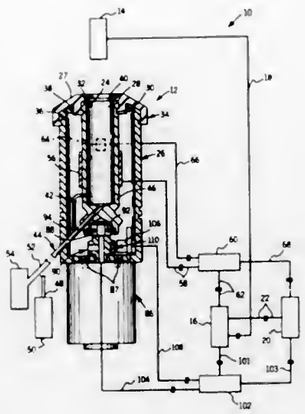
Continuation-in-part of Ser. No. 283,379, Aug. 1, 1994, abandoned. This application Dec. 15, 1994, Ser. No. 356,412

Int. Cl.[6] H01N *35/10*

U.S. Cl. 436—63 **24 Claims**

1. A method for preparing a solution made from a first predetermined volume of a first fluid and a second predetermined volume of a second fluid, the method comprising the steps of:

(a) operating a heater attached to a first housing and movable with the first housing for receiving the first fluid and the second fluid to apply thermal energy to the first housing, the first housing being operatively connected with and disposed substantially within a second housing;



(b) introducing the second predetermined volume of the second fluid to the first housing;

(c) vibrating the first housing with a prime mover to move the second predetermined volume of the second fluid in the first housing for a first predetermined time period while second housing remains substantially stationary with respect to the prime mover;

(d) introducing the first predetermined volume of the first fluid to the first housing;

(e) vibrating the first housing with the prime mover to move the first predetermined volume of first fluid and the second predetermined volume of second fluid in the first housing for a second predetermined time period to make the solution while the second housing remains substantially stationary with respect to the prime mover; and

(f) removing the solution made from the first predetermined volume of first fluid and the second predetermined volume of second fluid from the first housing.

5,589,395

METHOD FOR STABILIZING ANNEXINS

Jürgen Römisch; Bernhard Auerbach, and Hermann Pelzer, all of Marburg, Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 629,718, Dec. 18, 1990, abandoned. This application Apr. 15, 1993, Ser. No. 46,908

Claims priority, application Germany, Dec. 20, 1989, 39 42 081.7

Int. Cl.[6] G01N *33/92;11/00*

U.S. Cl. 436—71 **7 Claims**

1. A method for stabilizing annexins in a biological fluid sample comprising the steps of:

(a) obtaining the biological fluid sample; and

(b) bringing said sample into contact with an agent containing an anticoagulant, a chelate-forming agent and at least one aggregation inhibiting substance, said aggregation inhibiting substance selected from the group consisting of chloroquine, hydroxychloroquine, quinacrine, camoquine, dibucaine, lidocaine, procaine, tetracaine, chlorpromazine, trifluoparazine, reserpine, acetylsalicyclic acid, indomethacin, poquazone, prenylamine lactate, perhexiline maleate, nifedipine, verapamil and pentoxifylline.

5,589,396

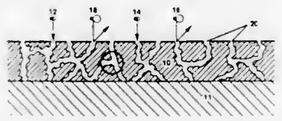
COATINGS WITH CONTROLLED POROSITY AND CHEMICAL PROPERTIES

Gregory C. Frye, Bernalillo County; C. Jeffrey Brinker, Albuquerque; Daniel H. Doughty, Albuquerque; Thomas Bein, Albuquerque, and Karin Moller, Albuquerque, all of N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Continuation of Ser. No. 686,548, Apr. 18, 1991, Pat. No. 5,224,972, which is a continuation-in-part of Ser. No. 580,373, Sep. 11, 1990, Pat. No. 5,151,110. This application Feb. 1, 1993, Ser. No. 11,518

Int. Cl.[6] B01D *53/04*

U.S. Cl. 436—73 **23 Claims**



1. A coating for providing both size selectivity and chemical selectivity among different chemical species, the chemical species comprising analyte species of larger size and analyte species of smaller size, the analyte species of smaller size comprising analyte species having either a predetermined chemical reactivity or a predetermined chemical non-reactivity, said coating comprising:

one or more layers comprising size selectivity means followed by chemical selectivity means wherein said chemical selectivity of the analyte species occurs only after said size selectivity of the analyte species;

wherein the layer which comprises said size selectivity means comprises pores having a predetermined uniform pore size, said predetermined uniform pore size sufficient to prevent the analyte species of larger size than said pores from entering said pores and said predetermined uniform pore size sufficient to allow the analyte species of smaller size than said pores to enter said pores;

wherein the layer which comprises said chemical selectivity means comprises chemical reaction sites for chemically sorbing the analyte species of smaller size with the predetermined chemical reactivity entering said pores and not chemically sorbing the other analyte species of smaller size with the predetermined chemical non-reactivity entering said pores;

wherein said coating provides selectivity of the analyte species of smaller size having the predetermined chemical reactivity from the analyte species of larger size and from the analyte species of smaller size having the predetermined chemical non-reactivity; and

wherein said coating comprises a sol-gel coating comprising said predetermined uniform pore size.

5,589,397

METHOD FOR MONITORING THE PERFORMANCE OF AN AMINO ACID SEQUENCER

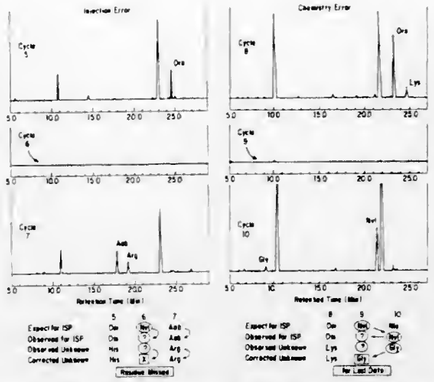
David C. Parmelee, Rockville, Md., and Salvatore Sechi, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 920,130, Jul. 24, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,212

Int. Cl.[6] G01N *33/48*

U.S. Cl. 436—89 **11 Claims**

1. A method for monitoring the performance of an amino acid sequencer during the sequencing of an unknown peptide or protein that is capable of distinguishing between a missed injection



sequencer error and an error caused by faulty delivery of chemicals during the sequencer reactions, comprising the steps of:

(1) simultaneously sequencing an internal standard comprising a peptide consisting essentially of unnatural amino acid residues and having an amino acid sequence containing at least two different unnatural amino acid residues, wherein the retention time for each unnatural amino acid residue following derivatization in an amino acid sequencer is distinct from the corresponding retention times for natural amino acid residues, and the unknown peptide or protein in the amino acid sequencer to produce a chromatogram, wherein the retention times corresponding to the unnatural amino acid residues of the internal standard are resolved from the retention times corresponding to natural amino acids; and

(2) comparing the retention times corresponding to the residues of the internal standard with predetermined information relating to the internal standard to monitor the performance of the amino acid sequencer.

5,589,398

USE OF TEST STRIPS TO DETERMINE THE UV INTENSITY OR TO PRE-DETERMINE THE DURATION OF STAY IN THE SUN WITHOUT SUNBURN

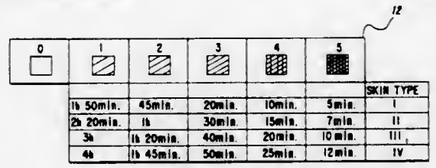
Manfred Krause, Viernheim; Norbert Kaufmann, Ruppertsberg, and Mathias Neumann, Weinheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Nov. 15, 1994, Ser. No. 340,394

Claims priority, application Germany, Nov. 15, 1993, 43 38 811.6

Int. Cl.[6] G01N *31/22;21/17*

U.S. Cl. 436—164 **7 Claims**



1. A method for predetermining the length of exposure to sunlight without sunburn for a person, comprising the following steps:

exposing to sunlight, a test strip comprising a matrix attached to a flat foil strip, wherein said matrix contains 18-molybdodiphosphoric acid, and

comparing any color changes in said photoactive chromogenic substance with a chart which correlates color changes in said photoactive chromogenic substance with the maximum duration of exposure to ultraviolet radiation possible without sunburn to the person.

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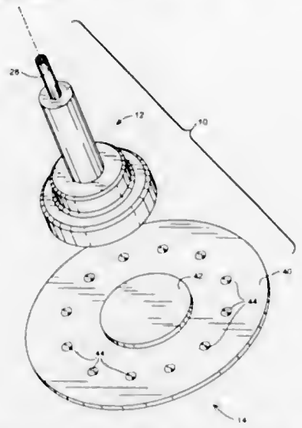
5,589,399

SYSTEM AND METHOD FOR PLASMA SEPARATION AND MEASUREMENT

Michael P. Allen, Los Altos; Robert F. Zuk, Burlingame, and Lawrence M. Ensler, Los Altos, all of Calif., assignors to First Medical, Inc., Mountain View, Calif.

Filed Oct. 21, 1994, Ser. No. 326,974
Int. Cl.[6] G01N *21/01*
U.S. Cl. 436—169 **19 Claims**



1. A system for transferring measured amounts of plasma from unmeasured blood samples to a test substrate, said system comprising:

an applicator having a blood-receiving reservoir with a predetermined plasma capacity and a single plasma transfer port having a cross-sectional area and shape in fluid communication with the reservoir and including a filter member extending across the plasma transfer port, wherein the filter member permits the passage of plasma and plasma macromolecules but inhibits the passage of blood cells;

a plasma-receiving test substrate having a surface; and

at least one reaction zone on the substrate surface; and

a single absorptive element on the substrate surface having a contact surface with a shape and area substantially identical to those of the port so that the contact surface is configured to engage the plasma transfer port and a plasma capacity which is less than the plasma capacity of the reservoir, wherein plasma transferred from the reservoir will saturate the absorptive element to provide a measured amount of plasma on the substrate; and wherein the at least one reaction zone is spaced from said single absorptive element.

5,589,400

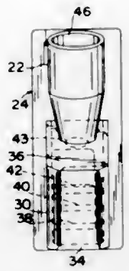
METHOD OF DISTRIBUTING MATERIAL ONTO A MICROSCOPE SLIDE OF A LARGE CYTOLOGY SAMPLE CHAMBER

William J. Hayes, Edgeworth, Pa., assignor to Shandon, Inc., Pittsburg, Pa.

Division of Ser. No. 355,630, Dec. 14, 1994, Pat. No. 5,470,758. This application Aug. 18, 1995, Ser. No. 516,916
Int. Cl.[6] G01N *9/30*
U.S. Cl. 436—177 **8 Claims**

1. A method of distributing biological material suspended in a liquid sample onto a microscope slide during centrifugation of said sample comprising the steps of:

(a) directing said liquid sample into a centrifuge sample chamber fastened to a microscope slide wherehy said sample advances downwardly along a tortuous path of vertically spaced surfaces in said chamber prior to centrifugation, each of said vertically spaced surfaces being in communication



with a discharge opening from said chamber to one surface of said microscope slide;

(b) directing said sample into said chamber until at least a portion of said biological material is deposited on portions of at least one of said vertically spaced surfaces; followed by

(c) centrifuging said sample chamber whereby said biological material on each of said surfaces passes through said discharge opening onto said one surface of said slide.

5,589,401

LIGHT SCATTER-BASED IMMUNOASSAY WITHOUT PARTICLE SELF AGGREGATION

W. Peter Hansen, 20 E. 35th St., Apt. 7G, New York, N.Y. 10016, and Michael Cennerazzo, 9 Oak St., Weehauken, N.J. 07087

Continuation of Ser. No. 994,903, Dec. 22, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 286,778
Int. Cl.[6] G01N *33/538;33/544;33/553*
U.S. Cl. 436—525 **36 Claims**

1. A particle light scatter-based immunoassay for measuring an analyte in a fluid sample, comprising the steps of:

a) combining with said fluid sample a reagent set including first binding molecule-coated monodisperse microspheres and second binding molecule-coated colloidal metal particles smaller than said microspheres or an immunocomplex comprising said monodisperse microspheres and said colloidal metal particles, to form a mixture and allow a reaction to occur, wherein at least one of said first and second binding molecules binds said analyte, said reaction being formation or decomplexation of said immunocomplex, so that the reacted mixture includes said microspheres in uncomplexed form, in said immunocomplex or both, the degree of binding of said microspheres in said reacted mixture with said colloidal metal particles being dependent upon presence or amount of said analyte in said fluid sample;

b) measuring light scattered by said microspheres in said reacted mixture by means of an optical flow particle analyzer to thereby provide light scatter signals for said microspheres;

c) determining a dimension of a statistical distribution of said light scatter signals from said microspheres in said reacted mixture, such that the dimension of said statistical distribution varies with the degree of binding of said microspheres with said colloidal metal particles in said reacted mixture; and

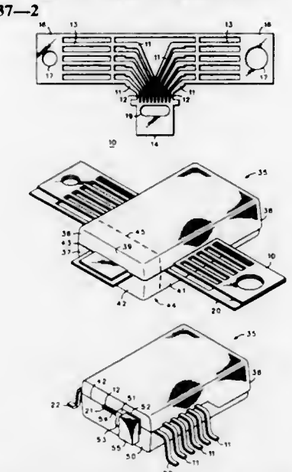
d) correlating said dimension of said statistical distribution of said light scatter signals for said microspheres in said reacted mixture with the amount of said analyte in said fluid sample.

5,589,402

PROCESS FOR MANUFACTURING A PACKAGE FOR MATING WITH A BARE SEMICONDUCTOR DIE

Kenneth C. Ramsey, Gilbert; William J. Miller, Mesa, and William M. Strom, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 155,880, Nov. 23, 1993, abandoned. This application Oct. 30, 1995, Ser. No. 550,416
Int. Cl.[6] H01L *21/56;21/60;21/70*
U.S. Cl. 437—2 **20 Claims**



1. A method of manufacturing a package for mating with a bare semiconductor die, comprising the steps of:

providing a leadframe having at least one lead wherein the at least one lead has a plurality of ends;

encapsulating a portion of the leadframe to form the package, wherein at least two ends of the at least one lead exit the package; and

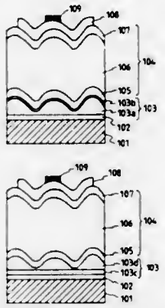
mating the bare semiconductor die externally to the package.

5,589,403

METHOD FOR PRODUCING PHOTOVOLTAIC DEVICE

Noboru Toyama, and Katsumi Nakagawa, both of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 341,948, Nov. 16, 1994, Pat. No. 5,500,055, which is a continuation of Ser. No. 13,109, Feb. 3, 1993, abandoned. This application Mar. 18, 1996, Ser. No. 573,996
Claims priority, application Japan, Feb. 5, 1992, 4-20052
Int. Cl.[6] H01K *31/18*
U.S. Cl. 437—2 **5 Claims**



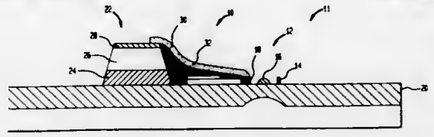
1. A method for producing a photovoltaic device provided with a metal layer with a smooth surface, a transparent layer composed of a plurality of layers on said metal layer, and a photovoltaic layer on said transparent layer, which comprises otilizing the difference in forming temperatures of said plural layers of said transparent layer and forming an irregular surface structure in a first said layer in contact with the smooth surface of said metal layer, and satisfying a relation T1>Tn between the forming temperature of T1 of said first layer the forming temperature Tn of the second to the nth layers, wherein said layer forming temperatures are numbered as the first layer forming temperature T1, the second layer forming temperature T2 . . . Tn from the metal layer side.

5,589,404

MONOLITHICALLY INTEGRATED VLSI OPTOELECTRONIC CIRCUITS AND A METHOD OF FABRICATING THE SAME

John E. Cunningham, Lincroft; Keith W. Goossen, Aberdeen; William Y. Jan, Scotch Plains; Rajiv N. Pathak, Matawan, and James A. Walker, Howell, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 1, 1994, Ser. No. 284,026
Int. Cl.[6] H01L *31/18*
U.S. Cl. 437—5 **15 Claims**



1. A process for fabricating a smart pixel array on a compound semiconductor surface having a preexisting VLSI electronic circuit on the surface, comprising the steps of:

thermally activating the compound semiconductor surface while directing an atomic gas plasma at the compound semiconductor surface for removing substantially all surface contaminants from the compound semiconductor surface to form a substantially impurity free compound semiconductor surface; and

growing a plurality of optical devices on said compound semiconductor surface at a temperature below 500° C.

5,589,405

METHOD FOR FABRICATING VDMOS TRANSISTOR WITH IMPROVED BREAKDOWN CHARACTERISTICS

Claudio Contiero, Buccinasco; Paola Galbiati, Monza, and Lucia Zullino, Milan, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Division of Ser. No. 19,124, Feb. 17, 1993, Pat. No. 5,430,316. This application Apr. 21, 1995, Ser. No. 403,629
Claims priority, application Italy, Feb. 18, 1992, MI92A0344
Int. Cl.[6] H01L *49/00*
U.S. Cl. 437—6 **21 Claims**

1. A method for fabricating vertical-current-flow field-effect transistors, comprising the steps of:

(a.) providing a substrate which includes at least one substantially monolithic volume of semiconductor material having a first conductivity type in proximity to a first surface thereof, and having a buried layer of a high concentration of said first conductivity type therebelow;

(b.) implanting said first surface with dopants having a second conductivity type, to form body regions in locations;

(c.) forming thick insulator regions to cover substantially all of said surface except for active area locations;

(d.) implanting said first surface with dopants of said first conductivity type, to form source regions within said body regions;

(e.) forming insulated gate regions on said first surface which are each capacitively coupled to at least some portion of said body region at said first surface;

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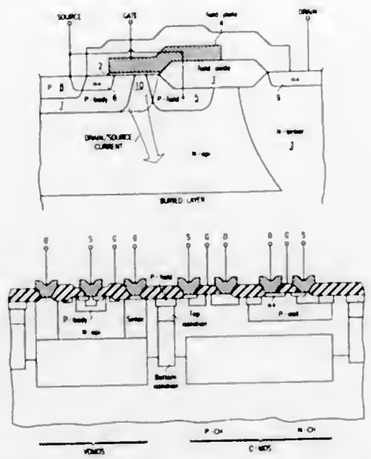


(f.) forming ohmic contacts to said source regions; and

(g.) forming ohmic contacts to said buried layer;

wherein ones of said source, gate, and body regions are formed to define at least one matrix comprising a plurality of cells, each cell comprising at least a portion of one of said source regions and a portion of one of said body regions, said matrix being laterally surrounded by a portion of said thick insulator region which is underlain by a field-isolation diffusion which is electrically connected to said body region of at least some ones of said cells of said matrix, and which is overlain by a field plate which is electrically connected to said gate region.

5,589,406

METHOD OF MAKING TFT DISPLAY

Naoki Kato, and Masaya Kunigita, both of Yokohama, Japan, assignors to AG Technology Co., Ltd., Yokohama, Japan

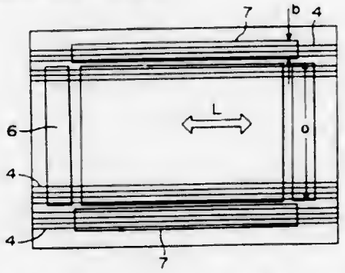
Filed Jul. 29, 1994, Ser. No. 282,433

Claims priority, application Japan, Jul. 30, 1993, 5-208393

Int. Cl.[6] H01L *21/84*

U.S. Cl. 437—21 **11 Claims**

1. A method which comprises:



forming an amorphous semiconductor layer on a substrate;

irradiating beam spots on the amorphous semiconductor layer;

scanning linearly the beam spots at scanning speed ≧ 10 m/s;

beam-annealing for polycrystallization the amorphous semiconductor layer to form a polycrystalline semiconductor layer;

forming stripes in the polycrystalline semiconductor layer;

forming semiconductor islands in the stripes; and

forming polycrystalline semiconductor channels for a pixel-drive-TFT, a row-drive-TFT and a column-drive-TFT in the semiconductor islands.

5,589,407

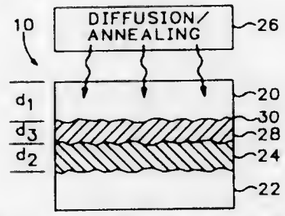
METHOD OF TREATING SILICON TO OBTAIN THIN, BURIED INSULATING LAYER

Narayanan Meyyappan, Camas, and Tatsuo Nakato, Vancouver, both of Wash., assignors to Implanted Material Technology, Inc.

Filed Sep. 6, 1995, Ser. No. 524,039

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—26 **21 Claims**



1. A method of forming a buried insulating film in a silicon substrate comprising the following steps:

(a) providing an ion source of a species A;

(b) forming a ion beam from the ion source;

(c) implanting ions into the substrate using the ion beam of step (b) to a depth, d_1;

(d) annealing the dosed substrate in an atmosphere having an amount of a second species, B, therein;

(e) diffusing species B into the substrate during annealing to the depth of (c);

(f) reacting species B with the substrate and implanted species A, thereby forming a buried layer of insulating material within the substrate.

5,589,408

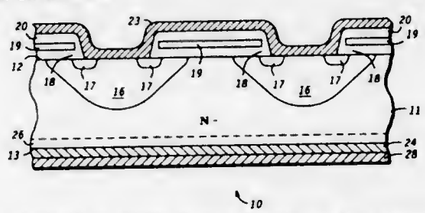
METHOD OF FORMING AN ALLOYED DRAIN FIELD EFFECT TRANSISTOR AND DEVICE FORMED

Francine Y. Robb; Stephen P. Robb, both of Tempe, and Paul J. Groenig, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1995, Ser. No. 498,158

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—29 **15 Claims**



1. A method of forming an alloyed drain field effect transistor, comprising the steps of:

providing a semiconductor substrate, the semiconductor substrate having a first major surface, a second major surface, and being of N-type conductivity and a first concentration;

forming at least one region of a P-type conductivity, the at least one region of the P-type conductivity extending into the semiconductor substrate;

forming at least one N-type conductivity region in the at least one region of the P-type conductivity, the at least one N-type conductivity region extending into the at least one region of the P-type conductivity;

forming a first layer of dielectric material overlying the first major surface;

patterning the first layer of dielectric material to expose portions of the at least one N-type conductivity region and the at least one region of P-type conductivity;

forming an electrically conductive material overlying the first major surface, wherein the electrically conductive material is patterned and electrically coupled to the exposed portions of the at least one region of the P-type conductivity and the at least one N-type conductivity region; and

forming a P-type region by alloying an metal-semiconductor contact with said semiconductor substrate, wherein the alloyed metal-semiconductor contact is comprised of a metal that dopes the semiconductor substrate to form a P-type region.

5,589,409

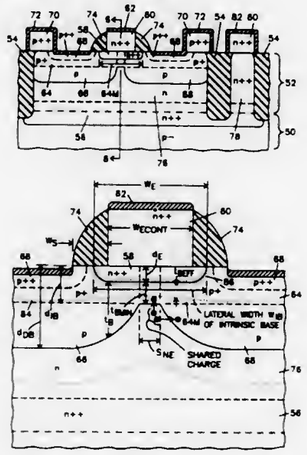
FABRICATION OF BIPOLAR TRANSISTORS WITH IMPROVED OUTPUT CURRENT-VOLTAGE CHARACTERISTICS

Constantin Bulucea, Milpitas, and Michael J. Grubisich, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 300,498, Sep. 2, 1994. This application Feb. 24, 1995, Ser. No. 393,647

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—31 **12 Claims**



1. A method of fabricating a bipolar transistor from a semiconductor body having a surface-adjoining major region of a first conductivity type, the major region having an upper surface, the method comprising the following steps:

(1) introducing primary dopant of a second conductivity type opposite to the first conductivity type into the major region through the major region's upper surface to define a first base layer of the second conductivity type;

(2) introducing dopant of the first conductivity type into the major region through a segment of the major region's upper surface to define an emitter of the first conductivity type such that the emitter overlies a main intrinsic base portion of the first base layer; and

(3) introducing further dopant of the second conductivity type into the major region through two laterally separated segments of the major region's upper surface, part of the further dopant being driven sideways and downward to form two encroaching base portions of the second conductivity type such that the encroaching base portions are continuous with the main intrinsic base portion, have a lighter doping than the main intrinsic base portion, extend deeper into the semiconductor body than the main intrinsic base portion, extend respectively below two corresponding parts of the main intrinsic base portion, extend laterally outward beyond the emitter, and are spaced laterally apart from each other below the main intrinsic base portion by a minimum spacing S_{NE} which is less than three times the minimum distance t_{BMIN} by which the main intrinsic base portion vertically separates the emitter and a main collector region of the first conductivity type underlying the main intrinsic base portion.

5,589,410

AN INTEGRATED SEMICONDUCTOR DEVICE HAVING A BURIED SEMICONDUCTOR LAYER AND FABRICATION METHOD THEREOF

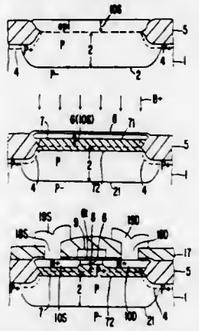
Noriaki Sato, and Fumitake Mieno, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 699, Jan. 5, 1993, Pat. No. 5,362,981. This application Jul. 22, 1994, Ser. No. 279,205

Claims priority, application Japan, Jan. 7, 1992, 4-000548

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—40 **5 Claims**



1. A method for production of an integrated semiconductor device comprising the steps of:

(a) forming a surface portion of a first conductivity type in a semiconductor substrate, wherein the surface portion borders a surface of the semiconductor substrate;

(b) forming an insulating layer on the semiconductor substrate, with a window exposing the surface portion;

(c) forming a semiconductor layer of the first conductivity type selectively on the surface portion within the window;

(d) forming an insulating gate film on a surface of the semiconductor layer within the window of the insulating layer;

(e) subsequently to said step (d), forming a buried semiconductor layer of the first conductivity type with an upper surface and a lower surface, wherein the upper surface is in the semiconductor layer;

(f) forming an insulated gate electrode on the insulating gate film across the window; and

(g) forming a first region of the first conductivity type and a pair of second regions of a second conductivity type opposite to the first conductivity type bordering the surface of the semiconductor layer, wherein the first region of the first conductivity type is between the pair of second regions of the second conductivity type.

5,589,411

PROCESS FOR FABRICATING A HIGH-VOLTAGE MOSFET

Sheng-Hsing Yang, Hsinchu, and Shing-Ren Sheu, Taoyuan, both of Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Jul. 28, 1995, Ser. No. 508,515

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—41 **7 Claims**

1. A process for fabricating a high-voltage MOSFET device on a semiconductor substrate doped with impurities of a first conductivity type as the drain region for said MOSFET device, said process comprising:

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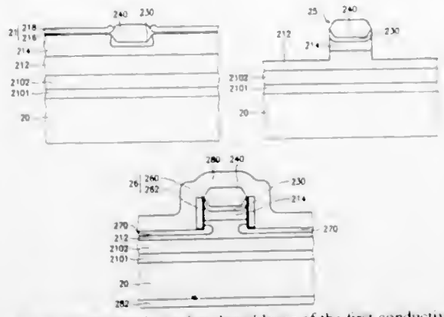


subsequently forming a first doped layer of the first conductivity type on said substrate, a second doped layer of the first conductivity type on said first doped layer, a third doped layer of the first conductivity type on said second doped layer and a shielding layer on said third doped layer, wherein said second doped layer has an impurity concentration smaller than the impurity concentration of said first doped layer and a thickness larger than the thickness of said first doped layer, and larger impurity concentration than the third doped layer and a smaller thickness than said third doped layer, and wherein said impurity concentration of said first doped layer is smaller than the impurity concentration of said substrate;

forming an opening in said shielding layer;

forming the source region of said MOSFET device in said third doped layer in the area exposed by said opening;

performing a thermal oxidation process for forming a field oxide layer over said source region;

etching said third doped layer by using said field oxide layer as a first mask thereby exposing said second doped layer to form a source protruding body;

forming an insulating layer around the sidewalls of said source protruding body; and

utilizing said field oxide layer and said insulating layer as a second mask for implanting impurities of a second conductivity type into said second doped layer, thereby forming the gate region for said MOSFET device.

5,589,412

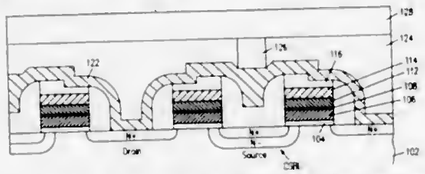
METHOD OF MAKING INCREASED-DENSITY FLASH EPROM THAT UTILIZES A SERIES OF PLANARIZED, SELF-ALIGNED, INTERMEDIATE STRIPS OF CONDUCTIVE MATERIAL TO CONTACT THE DRAIN REGIONS

Ali Iranmanesh, Sunnyvale; John M. Pierce, Palo Alto, and Albert M. Bergemont, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 269,892, Jul. 1, 1994, abandoned, which is a division of Ser. No. 207,858, Mar. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 168,756, Dec. 16, 1993, Pat. No. 5,416,349. This application Jun. 1, 1995, Ser. No. 456,548

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **8 Claims**



1. A method of fabricating a high-density flash electrically programmable read-only-memory (EEPROM) array, the method comprising the steps of:

providing a semiconductor substrate of P-type conductivity;

forming a plurality of spaced-apart field oxide regions on the semiconductor substrate;

forming a plurality of first implanted channel regions in the semiconductor substrate so that a pair of first implanted channel regions are formed between each pair of horizontally-adjacent field oxide regions, and so that each first implanted channel region adjoins both of the adjacent field oxide regions, each implanted channel region having a first side and a second side;

forming a layer of first gate dielectric material on the semiconductor substrate;

forming a layer of first conductive material over the layer of first gate dielectric material;

forming a layer of intermediate dielectric material over the layer of first conductive material;

etching the layer of intermediate dielectric material and the layer of first conductive material to define a plurality of strips of dielectric/conductive material,

forming a layer of second conductive material over the strips of dielectric/conductive material, the field oxide regions, and the semiconductor substrate;

forming a layer of third conductive material over the layer of second conductive material;

forming a layer of first insulation material over the layer of third conductive material;

etching the layer of first insulation material, the layer of third conductive material, and the layer of second conductive material to form a plurality of word lines;

etching the layer of intermediate dielectric material and the layer of first conductive material to form a plurality of floating gate memory cells;

forming a plurality of N+ buried drain regions in the semiconductor substrate so that each drain region adjoins the first side of each pair of implanted channel regions;

forming a plurality of common source bit lines in the semiconductor substrate so that the second side of each implanted channel region formed in one row of implanted channel regions and the second side of each implanted channel region formed in an adjacent row of implanted channel regions are adjoined by one common source bit line;

forming a plurality of strips of second insulation material so that each strip of second insulation material is formed over one common source bit line;

forming a plurality of strips of spacer material so that each strip of spacer material covers a portion of each drain region and each horizontally-adjacent field oxide region in each row of drain regions, and adjoins one word line, the underlying stacked gate structures, and the overlying layer of first insulation material;

forming a plurality of planar, intermediate interconnect strips over the strips of second insulation material, the strips of spacer material, the layers of first insulation, and the drain regions so that each planar, intermediate interconnect strip interconnects each drain region in one column of drain regions, each planar, intermediate interconnect strip having a substantially flat top surface;

forming a layer of third insulation material having a plurality of metal bit line openings formed therethrough over the strips of second insulation material, the strips of spacer material, the layers of first insulation material, the semiconductor substrate, and the plurality of planar, intermediate interconnect strips so that each planar, intermediate interconnect strip is periodically exposed by a metal bit line opening; and

forming a plurality of metal bit lines over the layer of third insulation material and the exposed portion of each planar, intermediate interconnect strip so that each metal bit line interconnects the exposed portions of one intermediate interconnect strip.

5,589,413

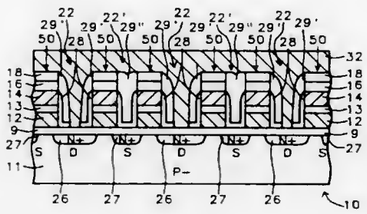
METHOD OF MANUFACTURING SELF-ALIGNED BIT-LINE DURING EPROM FABRICATION

Hung-Cheng Sung, Paoshan Hsin-Chu, Taiwan, and Ling Chen, Sunnyvale, Calif., assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Nov. 27, 1995, Ser. No. 562,868

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **20 Claims**



1. A method for manufacturing EPROM integrated circuit memory devices which comprises the steps of:

providing a semiconductor substrate having devices therein to which electrical connections are to be made,

forming a tunnel oxide layer on said substrate,

forming a blanket, doped, polysilicon layer over said tunnel oxide layer on said substrate,

forming an interelectrode dielectric layer over said blanket, doped, polysilicon layer,

forming a blanket polycide layer over said interelectrode dielectric layer,

forming a silicon dioxide dielectric layer over said blanket polycide layer,

forming a silicon nitride (Si_3N_4) layer over said silicon dioxide layer,

forming a source/drain mask over said silicon nitride layer with source/drain trench openings therein said source trench openings being substantially more narrow than said drain trench openings,

etching to form EPROM gate electrode stacks with trench spaces between said stacks in an array of said stacks, said stacks being formed by said silicon nitride (Si_3N_4) layer, said silicon dioxide dielectric layer, said polycide layer, said interelectrode dielectric layer, and said polysilicon layer down to said tunnel oxide layer,

said EPROM gate stacks having sidewalls with said trench spaces therebetween, said trench spaces between said sidewalls including source trench spaces over said source regions and drain trench spaces over said drain regions, said source trench spaces being substantially more narrow than said drain trench spaces,

ion implanting of source/drain dopant ions between said stacks forming alternating source regions and drain regions below said spaces between said sidewalls,

forming spacer dielectric structures adjacent to said sidewalls over said drain regions leaving narrow drain spaces therebetween and spacer dielectric plugs completely filling said spaces over said source regions,

forming a blanket dielectric layer over said stacks, said spaces and said sidewalls,

etching bit-line conductor openings across said device and drain trench openings through said blanket dielectric layer down to said drain regions,

forming a bit-line conductive metal blanket layer over said device extending down into contact with said drain regions through said drain trench openings,

etching back said conductive metal blanket layer leaving conductor lines in contact with said drain regions,

whereby said EPROM memory devices include a self-aligned bit-line structure formed simultaneously with electrical contacts to the drain electrodes.

5,589,414

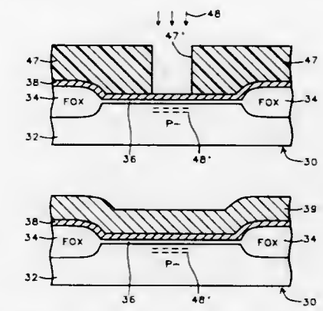
METHOD OF MAKING MASK ROM WITH TWO LAYER GATE ELECTRODE

Yeh-Jye Wann, Taipei, and Hsien-Tsong Liu, Keelung, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Jun. 23, 1995, Ser. No. 494,585

Int. Cl.[6] H01L *21/8246*

U.S. Cl. 437—44 **21 Claims**



1. A process of manufacture of a semiconductor device adapted for inclusion in a semiconductor memory system, formed on a semiconductor substrate covered with a gate oxide layer between field oxide regions, comprising:

forming a blanket lower lamina for a gate electrode on the surface of said gate oxide layer and said field oxide regions,

forming a mask contacting said lower lamina with a mask code opening therethrough over a location for the gate electrode,

forming a doped code implant region in said substrate by ion implanting code implant dopant through said Mask code opening into said code implant region,

removing said mask,

forming a blanket upper lamina of said gate electrode on the surface of said lower lamina,

forming a gate mask over said upper lamina and said lower lamina, said gate mask patterned to protect the gate location and leaving the remainder of said upper and lower lamina as exposed surfaces,

etching away all exposed surfaces of said upper and lower lamina unprotected by said gate mask leaving a laminated gate electrode formed by the remainder of said upper lamina and said lower lamina,

forming lightly doped regions in said substrate between said field oxide regions and said gate by ion implanting dopant through portions of said gate oxide layer unprotected by said gate electrode,

forming dielectric spacers adjacent to said gate electrode, and

forming heavily doped source and drain regions in said substrate between said field oxide regions and said spacers adjacent to said gate electrode by ion implanting dopant through portions of said gate oxide layer unprotected by said spacers and said gate electrode.

5,589,415

METHOD FOR FORMING A SEMICONDUCTOR STRUCTURE WITH SELF-ALIGNED CONTACTS

Richard A. Blanchard, Los Altos, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 7, 1995, Ser. No. 472,336

Int. Cl.[6] H01L *21/70*

U.S. Cl. 437—57 **16 Claims**

1. An integrated circuit fabrication method, comprising the steps of:

(a.) forming a first patterned thin-film polycrystalline semiconductor layer to provide insulated gates over first and second crystalline semiconductor regions, said second crystalline

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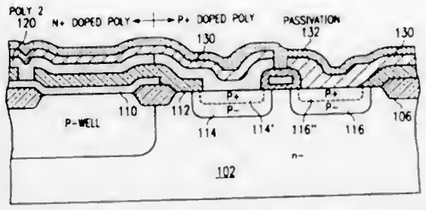


semiconductor region having a first conductivity type and said first crystalline semiconductor region having a second conductivity type;

(b.) forming an interlevel dielectric over said first patterned thin film polycrystalline semiconductor layer;

(c.) depositing a second polycrystalline semiconductor layer which at least partly overlies said interlevel dielectric, and patterning said second polycrystalline semiconductor layer to expose first portions, but not second portions, of said first and second crystalline semiconductor regions;

(d.) doping a first portion of said second polycrystalline semiconductor layer with first-conductivity-type dopants, and simultaneously doping any exposed portions of said first crystalline semiconductor regions;

(e.) doping a second portion of said second polycrystalline semiconductor layer with second-conductivity-type dopants, and simultaneously doping said first portions of said second crystalline semiconductor regions; and

(f.) cladding said second polycrystalline semiconductor layer with a cladding layer of metallic conductivity which shunts at least some of the lateral junctions between said first and second portions of said second polycrystalline layer;

whereby said steps c), d), and e) create an asymmetrical source/drain structure.

5,589,416

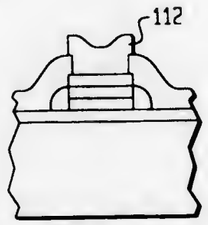
PROCESS FOR FORMING INTEGRATED CAPACITORS

Sailesh Chittipeddi, Austin, Tex., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 6, 1995, Ser. No. 568,040

Int. Cl.[6] H01L *21/70*

U.S. Cl. 437—60 **5 Claims**



1. Process for the manufacture of an integrated circuit including a capacitor, the capacitor comprising a first plate, a capacitor dielectric, and a second plate, the process comprising the steps of:

a. growing a field oxide layer on a silicon substrate,

b. depositing a layer of polysilicon on the field oxide,

c. depositing a capacitor dielectric layer comprising silicon dioxide on the polysilicon layer,

d. lithographically forming a pattern in the capacitor dielectric layer to form an oxide hardmask, said pattern defining a mask for the first plate of said capacitor, and said mask also serving as the capacitor dielectric,

e. removing the unmasked portions of the polysilicon layer using the oxide hardmask as an etch mask, thereby exposing portions of the field oxide,

f. forming a blanket insulating layer over the oxide hardmask and the exposed portions of the field oxide,

g. anisotropically etching said blanket insulating layer to form sidewall spacers on the vertical edges of the etched polysilicon and hardmask of the capacitor,

h. depositing a blanket layer of titanium-nitride,

i. masking the titanium layer with a mask corresponding essentially to the mask used to form the hardmask,

j. patterning the titanium nitride layer to form the second plate of the capacitor,

k. depositing an insulating layer over the patterned titanium nitride layer,

l. opening a contact window to said second plate of the capacitor,

m. depositing a metal layer over the contact window, and

n. etching said metal layer to form a contact to said second capacitor plate.

5,589,417

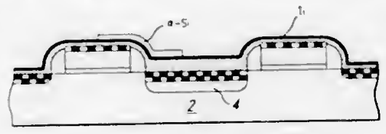
TISI$_2$/TIN CLAD INTERCONNECT TECHNOLOGY

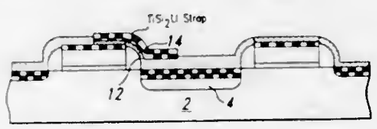
Shin-Puu Jeng, Plano, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Division of Ser. No. 369,562, Jan. 6, 1995, which is a continuation of Ser. No. 186,828, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 3,209, Jan. 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 481,665

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—190 **8 Claims**





1. A process for forming a local interconnect comprising:

depositing a refractory metal layer over a substrate which includes silicon;

annealing the structure thus formed by the foregoing process step in a first ambient gas so as to form a first barrier metal material adjacent a first silicide region;

depositing a refractory metal on said first barrier metal material;

depositing silicon on said refractory metal deposited on said first barrier metal material;

annealing the structure thus formed by the foregoing process steps in a second ambient gas so as to form a second barrier metal material adjacent a conductive region; and

substantially etching away exposed regions of said first and said second barrier metal materials.

5,589,418

METHOD OF FORMING A POLYSILICON BURIED CONTACT

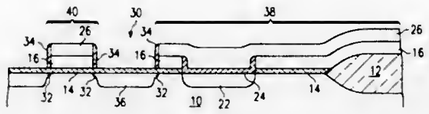
Alexander Kalnitsky, San Francisco, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 102,529, Aug. 4, 1993, Pat. No. 5,410,174. This application Nov. 21, 1994, Ser. No. 342,863

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—193 **18 Claims**

1. A method of forming a buried contact of an integrated circuit comprising the steps of:



forming a field oxide region over a portion of a substrate leaving an exposed active region;

forming an oxide layer over the active region;

forming a first silicon layer over the oxide layer and the field oxide region;

forming and patterning a first photoresist layer over the first silicon layer;

etching the first silicon layer to form an opening therethrough exposing a portion of the oxide layer;

etching the oxide layer through the opening exposing a portion of the substrate;

forming a conductive etch stop layer over the exposed portion of the substrate and the first photoresist layer;

removing the first photoresist layer and the etch stop layer disposed over the first photoresist layer;

forming a second silicon layer over the first silicon layer and the remaining etch stop layer;

forming and patterning a second photoresist layer over the second silicon layer; and,

etching the first and second silicon layers to form a conductive structure contacting the exposed portion of the substrate through the etch stop layer.

5,589,419

PROCESS FOR FABRICATING SEMICONDUCTOR DEVICE HAVING A MULTILEVEL INTERCONNECTION

Akihiko Ochiai, Kanagawa, Japan, assignor to Sony Corporation, Japan

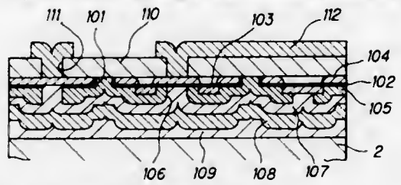
Filed Jul. 21, 1995, Ser. No. 505,786

Claims priority, application Japan, Jul. 26, 1994, 6-194873

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—795 **6 Claims**

1. A process for fabricating a semiconductor device having a



multilevel interconnection, comprising:

forming a trench on the surface of a first substrate to provide an element isolating region;

forming a first insulating film on the surface of the trench and the first substrate;

forming a first interconnection layer on the surface of the first insulating film;

forming a second insulating film on the surface of the first substrate in such a manner that the first interconnection layer is covered and the trench is filled;

forming a second interconnection layer on the second insulating film;

forming sequentially in this order, a third insulating film and an adhesion layer on the surface of said second insulating film covering the second interconnection layer;

bonding a second substrate on the surface of the adhesion layer;

planarizing the back of the first substrate by removing the first substrate from the back side thereof and the bottom of the trench; and

forming a fourth insulating film on the back of the first substrate, and forming a third interconnection layer on the fourth insulating film.

5,589,420

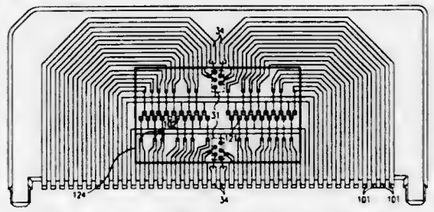
METHOD FOR A HYBRID LEADFRAME-OVER-CHIP SEMICONDUCTOR PACKAGE

Ernest J. Russell, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 304,988, Sep. 13, 1994. This application Jun. 7, 1995, Ser. No. 475,446

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—220 **4 Claims**



1. A method for electrically coupling bonding pads of a semiconductor component to a leadframe with a conducting wire, wherein said leadframe is positioned in a leadframe-over-chip with respect to said semiconductor component, wherein said bonding pads form at least one row in a center portion of said semiconductor component generally parallel to an edge of said semiconductor component, said method comprising the steps of:

locating a bonding finger of a leadframe conducting lead in an off-chip position;

bonding a first end of said conducting wire to said off-chip bonding finger; and

bonding a second end of said conducting wire to a selected semiconductor component bonding pad.

5,589,421

METHOD OF MANUFACTURING ANNEALED FILMS

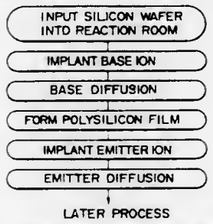
Naoto Miyashita, Yokohama; Koichi Takahashi, Kawasaki; Mitsutoshi Koyama, Tokyo; Shinji Nunotani, Yokohama; Satoshi Yanagiya, Kawasaki, and Yoshiro Baba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 98,245, Jul. 29, 1993, abandoned, which is a continuation of Ser. No. 732,762, Jul. 19, 1991, abandoned. This application Sep. 1, 1994, Ser. No. 300,067

Claims priority, application Japan, Jul. 20, 1990, 2-192100; Mar. 19, 1991, 3-080688

Int. Cl.[6] H01L *21/302;21/463*

U.S. Cl. 437—225 **6 Claims**



1. A method of manufacturing thermally annealed films, comprising the steps of:

decreasing internal temperature of a furnace to 150° C. or less;

inserting a semiconductor wafer into the furnace;

increasing the internal temperature of the furnace to a first temperature;

reducing internal pressure of the furnace to a first pressure;

decreasing the internal temperature for a second time to a second temperature necessary for forming a reaction film, the second temperature being higher than the first temperature;

increasing the internal pressure of the furnace to a second pressure;

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forming the reaction film after the internal temperature of the furnace is decreased to the second temperature and the internal pressure of the furnace is increased to the second pressure; then decreasing the internal temperature of the furnace for a third time to 150° C. at a rate of 10° C. or more/min.; and removing the semiconductor wafer from furnace after the internal temperature of the furnace is decreased to 150° C.

5,589,422

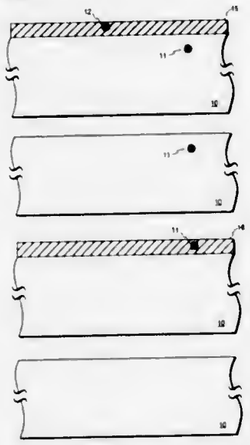
CONTROLLED, GAS PHASE PROCESS FOR REMOVAL OF TRACE METAL CONTAMINATION AND FOR REMOVAL OF A SEMICONDUCTOR LAYER

Suresh A. Bhat, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 15, 1993, Ser. No. 5,475

Int. Cl.[6] H01L *21/311;21/316*

U.S. Cl. 437—228 **29 Claims**



1. A process for treating a semiconductor layer to remove contaminants and impurities therein, comprising the steps of:

a) oxidizing at least a portion of said semiconductor layer in a gaseous first ambient comprising ozone, said first ambient being oxidizing, to form an oxidized layer, wherein a portion of said semiconductor layer is consumed; and

b) etching at least a portion of said oxidized layer in a second ambient, said second ambient being gaseous, to expose a surface;

wherein said semiconductor layer is maintained in an absence of UV radiation and at a temperature within a range of approximately room temperature to 300° C. during and between steps a and b.

5,589,423

PROCESS FOR FABRICATING A NON-SILICIDED REGION IN AN INTEGRATED CIRCUIT

Ted R. White; Ting-Chen Hsu; Bradley M. Somero; Mark A. Chonko, and Jung-Hui Lin, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 317,045

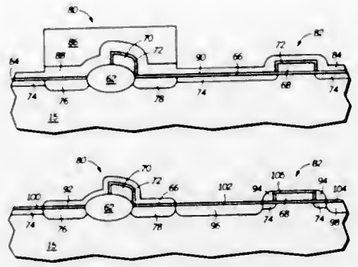
Int. Cl.[6] H01L *21/70;27/00;21/465;21/306*

U.S. Cl. 437—228 **16 Claims**

1. A process for fabricating a non-silicided region in an integrated circuit comprising the steps of:

providing a substrate having a silicide blocking layer overlying a dielectric layer;

forming a carbonaceous mask on a first portion of the silicide blocking layer and leaving a second portion exposed;



partially etching the second portion of the silicide blocking layer using the carbonaceous mask as an etching mask;

removing the carbonaceous mask;

etching away the second portion of the silicide blocking layer, after removing the carbonaceous mask, to expose a portion of the dielectric layer;

etching away the portion of the dielectric layer; and

forming a silicide layer in the portion of the substrate, after etching away the portion of the dielectric layer.

5,589,424

PHOTODEFINABLE DIELECTRIC LAYERS COMPRISING POLY(AROMATIC DIACETYLENES)

Elizabeth W. Kwock, Califon, and Timothy M. Miller, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 173,284, Dec. 22, 1993. This application Oct. 17, 1995, Ser. No. 543,900

Int. Cl.[6] H01L *21/312*

U.S. Cl. 437—229 **3 Claims**

1. In the method of making a multichip module comprising the steps of providing a substrate, applying conductors and resistors to a surface of the substrate, applying a layer of photodefinable dielectric material to said surface, exposing selected portions of said layer to light and developing the exposed layer to define a pattern of dielectric, the improvement wherein:

said photodefinable dielectric material comprises a copolymer of diethynyldiphenyl ether and an aromatic diacetylene.

5,589,425

PROCESS OF SELECTIVE AREA CHEMICAL VAPOR DEPOSITION OF METAL FILMS

Masataka Hoshino, and Nobuhiro Misawa, both of Kawasaki, Japan, assignors to Fijitsu Limited, Kanagawa, Japan

Filed Nov. 29, 1994, Ser. No. 350,036

Claims priority, application Japan, Feb. 9, 1994, 6-035159

Int. Cl.[6] C23C *16/00*

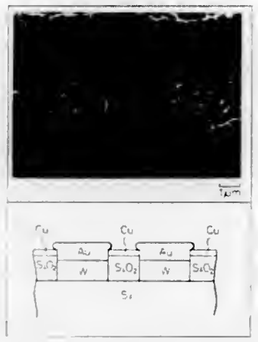
U.S. Cl. 427—250 **5 Claims**

1. A process of growing a film of a noble metal on a substrate in a selective area thereof by chemical vapor deposition, said process comprising the steps of:

preparing a source material having a molecule comprising a noble metal and a hexafluoroacetylacetonate radical ($C_5HF_6O_2$);

providing a substrate having a selective area made of a first substance which is unreactive with said radical and an other area made of copper which is reactive with said radical; and

supplying said source material onto said substrate held at a film growing temperature to induce a reaction on said substrate, such that, in said selective area, said molecule of source material is bonded to said first substance and decomposed to precipitate said noble metal on said first substance while, in said other area, said radical of said molecule is combined with



said copper to cover said other area of said substrate with a coating which is unreactive with said molecule of said source material.

5,589,426

MONOLITHIC REFRACTORIES

Itsutoshi Iwasaki; Tatsuo Yamasaki, and Hideaki Sawada, all of Fukuoka-ken, Japan, assignors to Taikorozai Co., Ltd., Fukuoka-ken, Japan

Filed Jul. 9, 1993, Ser. No. 89,677

Claims priority, application Japan, Jul. 14, 1992, 4-209743

Int. Cl.[6] C04B *35/66*

U.S. Cl. 501—32 **1 Claim**

1. Monolithic refractories comprising 100% by weight of refractory aggregate powders, and in addition thereto, based on the weight of said powders, 0.05 to 5% by weight of a binder selected from the group consisting of phosphate glass mainly composed of P_2O_5-Al_2O_3-Na_2O-K_2O, and hydroxycarboxylates and combinations of the phosphate glass and hydroxycarboxylates, and 0.01 to 1% by weight of a thickener, characterized in that said monolithic refractories have been kneaded with water or other kneading liquid,

wherein the thickener is a cellulose compound or a copolymer of maleic anhydride and isobutylene, wherein hydroxycarboxylates are glycolate, tartrate, lactate and citrate, the metal of which is lithium, sodium, potassium or aluminum.

5,589,427

SUBSTANTIALLY SPHERICAL PARTICLES OF LITHIUM SILICATES WITH IMPROVED MECHANICAL PROPERTIES AND IMPAIRED SURFACE QUALITY

Mario Dalle Donne, Stutensee; Guster Schumacher, Karlsruhe; Volkmar Geiler, Mainz; Marc Clement, Mainz, and Burkhart Speit, Mainz, all of Germany, assignors to Schott Glaswerke, Mainz, Germany

PCT No. PCT/EP93/00671, § 371 Date Dec. 29, 1994, § 102(e) Date Dec. 29, 1994, PCT Pub. No. WO93/19474, PCT Pub. Date Sep. 30, 1993

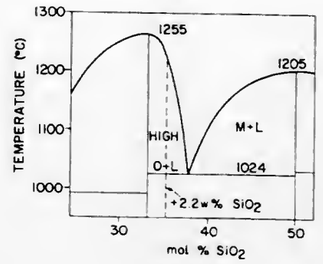
PCT Filed Mar. 19, 1993, Ser. No. 307,693

Claims priority, application Germany, Mar. 24, 1992, 42 09 420.8

Int. Cl.[6] C04B *35/16*

U.S. Cl. 501—33 **14 Claims**

1. A composition comprising particles of lithium orthosilicate, wherein said particles further contain tellurium, a tellurium compound, or combinations thereof.



5,589,428

SILICON CARBIDE WITH CONTROLLED POROSITY

Ramesh Divakar, and Sai-Kwing Lau, both of East Amherst, N.Y., assignors to The Carborundum Company, Worcester, Mass.

Continuation of Ser. No. 295,956, Aug. 25, 1994, abandoned, which is a division of Ser. No. 65,037, May 25, 1993, Pat. No. 5,395,807, which is a continuation-in-part of Ser. No. 23,769, Feb. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 910,042, Jul. 8, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 464,919

Int. Cl.[6] C04B *35/569;35/576*

U.S. Cl. 501—88 **20 Claims**

1. A silicon carbide sintered body comprising controlled porosity in the range of about 2 to about 12 volume percent, said pores being distributed uniformly throughout the body, substantially independent, closed, essentially spherical in shape, and having a nominal diameter between about 50 microns and about 500 microns.

5,589,429

ALUMINUM NITRIDE SINTERED BODY AND PROCESS FOR PRODUCING THE SAME

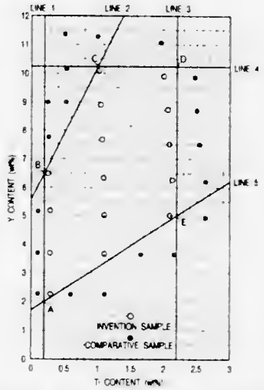
Kenzo Kawaguchi; Tetsuya Takemura; Hideki Matsubara; Sinya Takagi, and Atsushi Kanda, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Dec. 27, 1994, Ser. No. 364,497

Claims priority, application Japan, Dec. 27, 1993, 5-352132

Int. Cl.[6] C04B *35/58*

U.S. Cl. 501—96 **7 Claims**



1. An aluminum nitride sintered body comprising aluminum nitride as a main component, a titanium compound, and an yttrium compound, wherein when the content of titanium and the content of yttrium both in terms of percentage by weight based on said

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aluminum nitride sintered body are plotted on an x-y coordinate system, with the titanium content as the x axis and the yttrium content as the y axis, the titanium content and the yttrium content each is within a region surrounded by the lines connecting points A and B, B and C, C and D, D and E, and E and A, inclusive of the lines, said points A, B, C, D and E being:

A (0.2, 2.0)
B (0.2, 6.5)
C (1.0, 10.25)
D (2.2, 10.25)
E (2.2, 5.0).

5,589,430

DENSELY SINTERED, TABULAR CERAMIC PARTS OF ALUMINUM OXIDE HAVING IMPROVED THERMAL SHOCK RESISTANCE

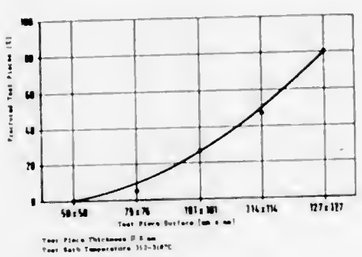
Wolfgang Krahn; Johannes Ernst, both of Marktredwitz, and Claudia Drabent, Fuchsmühl, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 188,678, Jan. 31, 1994, Pat. No. 5,518,974. This application Dec. 29, 1995, Ser. No. 580,859

Claims priority, application Germany, Feb. 2, 1993, 43 02 795.4

Int. Cl.[6] C04B *35/44*

U.S. Cl. 501—120 **13 Claims**



1. A densely sintered ceramic part, comprising aluminum oxide and magnesium as $MgAl_2O_4$, which is added in the form of non-agglomerated MgO having an average particle size d_{50} of at most 0.8 μm, wherein said part has improved shock thermal resistance and a fine porosity of at most 10% by volume, and wherein said part does not contain any inclusions having a diameter of ≧70 μm within the ceramic microstructure and wherein said ceramic part is not cracked or fractured on immersion in a molten bath having a temperature of at least 350° C.

5,589,431

DOUBLE METAL CYANIDE COMPLEX CATALYSTS

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 156,534, Nov. 23, 1993, Pat. No. 5,470,813. This application Jun. 7, 1995, Ser. No. 476,479

Int. Cl.[6] B01J *27/26*

U.S. Cl. 502—175 **9 Claims**

1. A method of preparing an epoxide polymer, said method comprising polymerizing an epoxide in the presence of a catalyst which comprises at least about 70 wt. % of a substantially amorphous double metal cyanide complex.

5,589,432

EXHAUST GAS CLEANER AND METHOD FOR CLEANING SAME

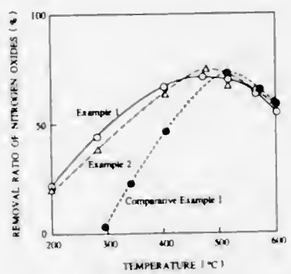
Kiyohide Yoshida; Gyo Muramatsu; Akira Abe, and Naoko Irite, all of Kumagaya, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Division of Ser. No. 171,679, Dec. 22, 1993, abandoned. This application May 4, 1995, Ser. No. 434,915

Claims priority, application Japan, Dec. 28, 1992, 4-360377; Feb. 15, 1993, 5-48613; May 10, 1993, 5-132581; May 12, 1993, 5-133954; May 26, 1993, 5-146917; Jul. 20, 1993, 5-200391

Int. Cl.[6] B01J *23/72;8/02;* **C01B** *21/00*

U.S. Cl. 502—325 **12 Claims**



1. An exhaust gas cleaner having an inlet side and an outlet side for removing nitrogen oxides from an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which consists essentially of a first catalyst on the inlet side of said exhaust gas cleaner and a second catalyst on the outlet side of said exhaust gas cleaner, said first catalyst consisting essentially of 0.2–15 weight % of silver or silver oxide supported on a porous inorganic oxide, and said second catalyst consisting essentially of 0.2–15 weight % of silver or silver oxide and up to 2 weight % of copper or copper oxide supported on a porous inorganic oxide.

5,589,433

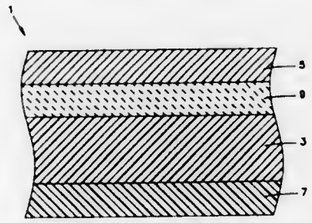
THERMAL TRANSFER SYSTEMS HAVING VANADIUM OXIDE ANTISTATIC LAYERS

Eric D. Morrison, West St. Paul; Jeffrey C. Chang, North Oaks, and Linda K. Williams, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 15,419, Feb. 9, 1993, abandoned. This application Jun. 23, 1994, Ser. No. 264,463

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **8 Claims**



1. A thermal transfer donor sheet comprising a flexible substrate having a frontside and a backside, a colorant layer coated on the frontside, and a vanadium oxide antistatic layer coated on the flexible substrate wherein the vanadium oxide antistatic layer comprises needle-shaped vanadium oxide particles in intimate contact with other vanadium oxide particles.

5,589,434

RECEPTOR LAYER TRANSFER SHEET, THERMAL TRANSFER SHEET, THERMAL TRANSFER METHOD AND APPARATUS THEREFOR

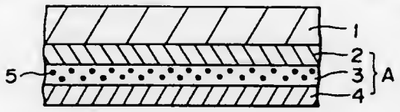
Hidetake Takahara; Takeshi Ueno; Katsuyuki Oshima; Mikio Asajima, and Mineo Yamauchi, all of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo-to, Japan

Division of Ser. No. 103,360, Aug. 6, 1993, Pat. No. 5,424,267,. This application Mar. 7, 1995, Ser. No. 399,845

Claims priority, application Japan, Jul. 27, 1990, 2-197806; Sep. 27, 1990, 2-255165; Sep. 27, 1990, 2-255166; Nov. 29, 1990, 2-325470; Dec. 25, 1990, 2-412857; Jan. 17, 1991, 3-15697; Jan. 17, 1991, 3-15699; Apr. 22, 1991, 3-116609

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **8 Claims**



1. A receptor layer transfer sheet comprising a substrate sheet and a transferable layer disposed on one side surface of the substrate sheet, the transferable layer being peelable from the substrate sheet and comprising a dye receptor layer, wherein the transferable layer has an adhesive layer disposed thereon by the medium of an intermediate layer, and at least one layer selected from the dye receptor layer, intermediate layer and the adhesive layer contains bubbles.

5,589,435

SHEET CAPABLE OF RELEASING A THERMAL TRANSFER IMAGE-RECEIVING LAYER, A METHOD FOR TRANSFERRING A THERMAL TRANSFER IMAGE-RECEIVING LAYER FROM THE SHEET AND A METHOD FOR FORMING IMAGES

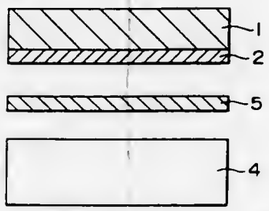
Kengo Ito, Miyagi; Kaori Isaji, Chiba; Yoshio Fujiwara, Tochigi; Mitsuhiro Isogai, and Masanobu Hida, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 242,418, May 13, 1994, Pat. No. 5,446,012. This application Jun. 6, 1995, Ser. No. 471,767

Claims priority, application Japan, May 19, 1993, 5-141585

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **10 Claims**



5. A method for transferring a thermal transfer image-receiving layer from an image transfer sheet to a substrate comprising the steps of:

providing a transfer sheet of the type including a release base sheet and a thermal transfer image-receiving layer formed on the release base sheet, said image-receiving layer being a dispersion including a resin binder and a dye-fixing amount of a layer compound capable of fixing cationic dyes through ion exchange reaction therewith, said layer compound being selected from the group consisting of: montmorillonite, magnesium montmorillonite, iron montmorillonite, iron magnesium montmorillonite, heidellite, aluminum heidellite, nontronite, aluminum nontronite, saponite, aluminum saponite, hectorite, sauconite, halogen-substituted compounds of any of the foregoing, sodium silicic mica, sodium taeniolite and lithium taeniolite, cation exchangeable alkali metal cations and alkaline earth metal cations in said layer compound having been replaced by organic cations selected from the group consisting of alkyl-substituted quarternary ammonium ions and alkyl-substituted phosphonium ions, wherein said alkyl group substituents have not less than 8 carbon atoms;

superposing the image transfer sheet on a substrate, on which a thermal transfer image is to be formed in such a way that said image-receiving layer is in face-to-face relation with the substrate; and

peeling off the release base sheet from the image transfer sheet.

5,589,436

AGENT FOR PRESERVING THE FRESHNESS OF PLANTS

Hideaki Hagiwara, Takarazuka, and Toshiaki Suzuki, Kasai, both of Japan, assignors to Yoshihide Hagiwara, and HIH Biocenter, Inc., both of Takarazuka, Japan

Filed May 30, 1995, Ser. No. 453,467

Claims priority, application Japan, May 30, 1994, 6-137855

Int. Cl.[6] A01N *3/02*

U.S. Cl. 504—114 **10 Claims**

1. A method for preserving the freshness of cut flowers, cut sprays, cut leaves or a potted plant which comprises applying an effective amount of 2"-O-glucosylisovitexin thereto.

5,589,437

METHOD OF USING 5-HYDROXYBENZIMIDAZOLE COMPOUNDS FOR REDUCING TRANSPIRATION IN PLANTS

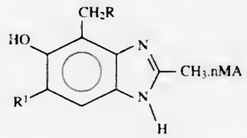
Klara D. Vichnevetskaia, Faculty of Forestry, University of Toronto, 33 Wilcoks St.; Terence J. Blake, Faculty of Forestry, University of Toronto, both of Toronto, Ontario, Canada; Eddie Bevilacqua, 3 Rutherford Avenue, Toronto, County of York, Province of Ontario, Canada, and Timothy J. B. Boyle, City of Bogor, Province of West Java, Indonesia

Filed Jun. 13, 1994, Ser. No. 258,806

Int. Cl.[6] A01N *43/40;43/52;43/84;43/90*

U.S. Cl. 504—225 **8 Claims**

1. A method of using a compound of the structural formula



wherein:

nMa connotes that the hydroxybenzimidazole derivative structurally presented above is a mineral acid salt; n is an integer 1 through 6; MA is a mineral acid selected from the group consisting of HNO_3, H_2SeO_4, $HClO_4$, $HBrO_4$, $HMnO_4$, HSO_3F, H_2SO_4, $H_2S_2O_7$, H_3PO_4, H_3BO_3, HF, HCl, HBr, HI, and mixtures thereof; R is hydrogen, dimethylamino, piperidinyl or morpholino; and R^1 is hydrogen or dimethylaminomethyl,

comprising applying a drought resistance enhancing amount of at least one of the above mentioned compounds to plants or seeds in need of having their drought resistance increased.

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5,589,438

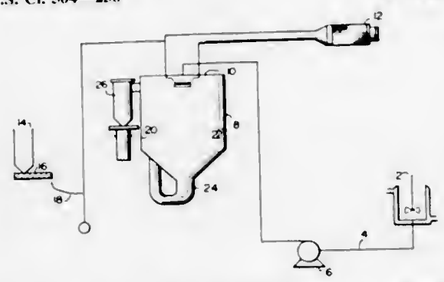
DRY FLOWABLE POWDERS OF HYGROSCOPIC PLANT GROWTH REGULATORS AND TABLETS FORMED OF THE SAME

Rudolph E. Lisa, Riverview; Terence K. Kilbride, Bloomfield Hills, both of Mich., and Karl-Friedrich Jager, Lumburgerhof, Germany, assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 95,122, Jul. 20, 1993, Pat. No. 5,468,720. This application Mar. 30, 1995, Ser. No. 415,124

Int. Cl.[6] **A01N** *25/12;43/40;43/58*

U.S. Cl. 504—236 **20 Claims**



1. A dry, flowable powder of a plant growth regulator formulation comprising a mixture of (i) a solid particulate consisting essentially of at least 95% by weight of a hygroscopic plant growth regulator, and (ii) an effective amount between 0.2 to 3 parts by weight per 100 parts by weight of the plant growth regulator of an inert flow aid sufficient to inhibit hygroscopicity of said plant growth regulator such that said powder remains free-flowing and non-caking.

5,589,439

TETRAZOLINONE DERIVATIVES

Toshio Goto, Shimotusga-gun; Koichi Moriya, Oaza; Fritz Maurer, Tochigi; Seishi Ito, Oyama; Katsuaki Wada, Tochigi; Kazuhiro Ukawa, Oyama; Ryo Watanabe, Tochigi; Asami Ito, Tochigi, and Natsuko Minegishi, Tochigi, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

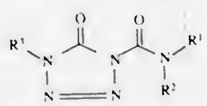
Filed Jul. 28, 1995, Ser. No. 508,776

Claims priority, application Japan, Aug. 5, 1994, 6-202919; Mar. 3, 1995, 7-068837

Int. Cl.[6] **A01N** *43/82;43/824;43/828;43/832;* **C07D** *409/04;407/04;405/04;403/04;* **A01N** *43/836;43/713;* **C07D** *417/04;413/04*

U.S. Cl. 504—261 **12 Claims**

1. A substituted tetrazolinone of the formula



(I)

wherein

R^1 is alkyl, haloalkyl, cycloalkyl, alkenyl, haloalkenyl, alkynyl, alkoxy or phenyl which is optionally substituted,

R^2 is alkyl, haloalkyl, cycloalkyl, alkenyl, haloalkenyl, alkynyl, alkoxy, or phenyl of which is optionally substituted, or

R^1 and R^2 form, together with the nitrogen atom to which they are bonded, a 5- or 6-membered heterocyclic ring, optionally fused to a carboxylic ring and optionally substituted by C_{1-4} alkyl,

and

R^3 is a 5-membered heterocyclic radical containing at least one hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, optionally substituted by at least one substituent selected form the group consisting of halogen, benzyl, phenyl, halogen-substituted phenyl, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1-4} alkylthio, C_{1-4} alkyl-sulfonyl and C_{3-8} cycloalkyl.

5,589,440

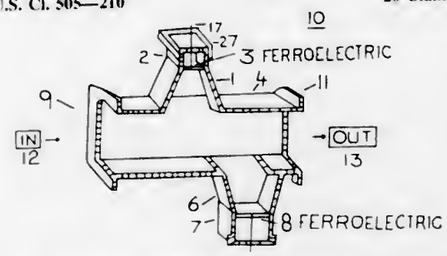
FERROELECTRIC RF LIMITER

Satyendranath Das, P.O. Box 574, Mountain View, Calif. 94042-0574

Continuation-in-part of Ser. No. 70,738, May 27, 1993, Pat. No. 5,329,261. This application Mar. 9, 1994, Ser. No. 207,750

Int. Cl.[6] **H01P** *1/22;* **H01B** *12/06*

U.S. Cl. 505—210 **20 Claims**



1. A ferroelectric waveguide limiter having an input, output, flanges and comprising of:

a main waveguide of appropriate length;

a first tapered branch guide being connected in series with the said main waveguide and having a length of one or more half wavelengths at the operating frequency of the limiter;

a first reduced height branch guide at the end of the tapered first branch guide;

a ferroelectric material being connected across the reduced height and in the middle of the reduced height branch guide at the junction of the tapered guide at the point of the maximum electric field, being one or more half wavelengths, at the operating frequency of the limiter, from the main waveguide forming a variable capacitor of a parallel resonant circuit tuned to the operating frequency of the limiter;

an appropriate length of the said reduced height first branch guide, behind the ferroelectric material, forming an inductance of a parallel resonant circuit tuned to the operating frequency of the limiter;

a waveguide short being connected at the end of the reduced height first branch guide;

a large level of input signal, at which the capacitance of the ferroelectric material and the inductance of the shorted reduced height first branch guide form parallel resonance tuned to the operating frequency of the limiter;

said limiter being operated slightly above the Curie temperature of the ferroelectric material; and

voltage means for applying a bias electric field to the ferroelectric material to set the zero signal operating point.

5,589,441

SUPERCONDUCTIVE FIBERFORM CERAMIC COMPOSITE

Anna L. Baker, Seattle, and Michael Strasik, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 833,862, Feb. 11, 1992, abandoned, which is a division of Ser. No. 381,498, Jul. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 698,496, Feb. 5, 1985, Pat. No. 5,041,321, which is a continuation-in-part of Ser. No. 667,568, Nov. 2, 1984, abandoned. This application Aug. 19, 1994, Ser. No. 293,256

Int. Cl.[6] **H01B** *12/02;* **H01L** *39/12;* **C04B** *35/45;35/624*

U.S. Cl. 505—125 **6 Claims**

1. A ceramic composite comprising a felted mat of ceramic particles and superconductive metal oxide particles bound together with a cured sol-gel precursor binder, wherein:

the ceramic particles include ceramic fibers selected from the group consisting of silica, alumina, mullite, zirconia, aluminosilicate, silicon nitride, and mixture thereof;

the superconductive metal oxide particles include fibers selected from the group consisting of superconductive oxide fibers, superconductive oxide coated ceramic fibers, and mixtures thereof,

the superconductive oxide coated ceramic fibers comprising a superconductive mixed metal oxide coating on a ceramic fiber;

the uncured, sol-gel precursor binder is an aqueous solution of metal salts stabilized in solution with ethylene glycol, and organic acid, or mixtures thereof;

wherein the superconductive metal oxide particles are present in sufficient amount to render the composite superconductive below the superconducting transition temperature of the superconductive metal oxide particles; and

wherein the ceramic fibers are about 0.0625–4.0 inches (0.16–10.2 cm) long and about 1–3 micrometers in diameter.

5,589,442

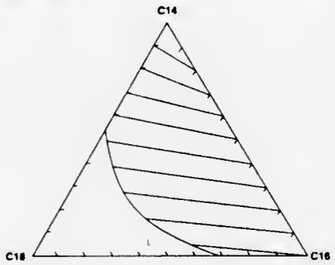
DRILLING FLUIDS COMPRISING MOSTLY LINEAR OLEFINS

Jeffrey C. Gee; Christophe J. Lawrie, and Roger C. Williamson, all of Kingwood, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 190,405, Feb. 2, 1994. This application Jun. 7, 1995, Ser. No. 480,986

Int. Cl.[6] **C09K** *7/02*

U.S. Cl. 507—103 **18 Claims**



1. An invert emulsion drilling fluid comprising:

(a) a continuous phase, comprising a mixture of mostly linear olefins containing 50 to 100% linear olefins and less than 20% alpha olefins, wherein the olefins contain at least 12 carbon atoms:

(b) a weight material; and

(c) water.

5,589,443

ROCK BIT GREASE COMPOSITION

Robert M. Denton, Friendswood, and Zhigang Fang, The Woodlands, both of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Dec. 21, 1995, Ser. No. 576,617

Int. Cl.[6] **C10M** *125/00;169/00*

U.S. Cl. 508—150 **35 Claims**

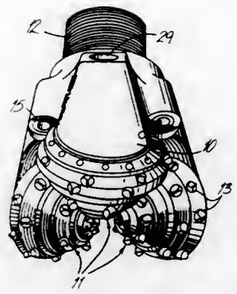
1. A rock bit for drilling subterranean formations comprising:

a bit body including a plurality of journal pins, each having a bearing surface;

a cutter cone mounted on each journal pin and including a bearing surface;

a grease reservoir in communication with such bearing surfaces;

a grease composition in the grease reservoir and adjacent the bearing surfaces, wherein the grease composition is silica free



and has a viscosity greater than 500 centistokes at 120° C., the grease composition comprising:

synthetic polymer lubricant basestocks;

a metal complex soap base thickener; and

a boron nitride extreme pressure agent.

5,589,444

GREASE COMPOSITION FOR CONSTANT VELOCITY JOINTS

Ko Hatakeyama, Fujisawa, Japan, assignor to Kyodo Yushi Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1996, Ser. No. 659,386

Int. Cl.[6] **C10M** *141/06;141/08*

U.S. Cl. 508—168 **5 Claims**

1. A grease composition for constant velocity joints consisting essentially of:

(a) a base oil;

(b) an urea thickener;

(c) molybdenum disulfide;

(d) a calcium salt or an overbasic calcium salt selected from the group consisting of calcium salts of oxidized waxes, calcium salts of petroleum sulfonates, calcium salts of alkyl aryl sulfonates, calcium salts of salicylate, calcium salts of phenates, overbasic calcium salts of oxidized waxes, overbasic calcium salts of petroleum sulfonates, overbasic calcium salts of alkyl aryl sulfonates, overbasic calcium salts of salicylate, and overbasic calcium salts of phenates;

(e) a metal-free sulfur-phosphorus extreme pressure agent; and

(f) molybdenum dithiocarbamate.

5,589,445

OVERBASED METAL SALTS, THEIR PREPARATION AND USE

Richard Leahy, and Stephen J. Cook, both of North Humberside, United Kingdom, assignors to BP Chemicals (Additives) Limited, London, England

Filed Aug. 21, 1995, Ser. No. 517,235

Claims priority, application United Kingdom, Aug. 19, 1994, 9416838

Int. Cl.[6] **C10M** *159/20;159/22*

U.S. Cl. 508—381 **21 Claims**

1. An overbased metal salt of a hydrocarbyl-substituted sulphurised or non-sulphurised phenol, a calixarene having a substituent hydroxyl group or groups available for reaction with metal base or a linear phenol/formaldehyde resin wherein the metal moiety comprises a first metallic component which is at least one alkaline earth metal and a second metallic component which is at least one of either (i) at least one alkali metal or (ii) at least one metal selected from Groups IIIa, IVa, Va, VIa, VIIa and VIII of either the first or the second transition series of the Periodic Table of the Elements, the weight ratio of the first metal component to the second metal component being in the range from 1000:1 to 2:1.

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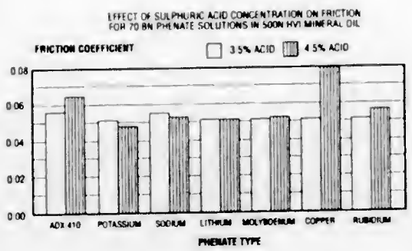


5,589,446

PROCESS FOR REMOVAL OF IONIC SALT DEPOSITS

Greg R. Unruh, Amarillo, Tex., assignor to Tech Spray, Inc., Amarillo, Tex.

Division of Ser. No. 218,903, Mar. 28, 1994, which is a continuation-in-part of Ser. No. 21,797, Feb. 24, 1993. This application Jun. 7, 1995, Ser. No. 477,116

Int. Cl.[6] **C07D** *323/00*

U.S. Cl. 510—175 **30 Claims**

1. A method of removing ionic residues from a printed circuit board surface which comprises:

providing a solid surface having an ionic salt residue disposed thereon containing at least one salt of an alkali metal or alkaline earth metal cation;

contacting the surface with a liquid cleaning mixture comprising an organic solvent selected from the group consisting of an alkyl halide, a paraffinic monohydric alcohol, a non-halogenated paraffin, an aromatic compound and a mixture thereof, and a complexing agent comprising a crown ether formed of a monocyclic oligoether ligand exclusively containing oxygen as donor atoms whereby said cleaning mixture solvates said ionic residue and said crown ether enters into a guest/host relationship with at least one alkali metal or alkaline earth metal cation corresponding to an alkali metal or alkaline earth metal salt in said residue;

withdrawing said cleaning mixture from said surface with said crown ether and said alkali metal or alkaline earth metal cation in a guest/host relationship.

5,589,447

LIQUID DISHWASHING-DETERGENT COMPOSITION

Jadwiga Palicka, Lidingö, Sweden, assignor to Berol Nobel AB, Stenungsund, Sweden

PCT No. PCT/EP93/03092, § 371 Date May 10, 1995, § 102(e) Date May 10, 1995, PCT Pub. No. WO94/11476, PCT Pub. Date May 26, 1994

PCT Filed Nov. 3, 1993, Ser. No. 433,436

Claims priority, application Sweden, Nov. 11, 1992, 9203373

Int. Cl.[6] **C11D** *1/12;1/72;1/90;1/94*

U.S. Cl. 510—237 **7 Claims**

1. An anionic surfactant-based liquid dishwashing-detergent composition, comprising

a) at least one amphoteric surface-active compound of type a) having the general formula (I)

$$R-(A)_n-(\underset{\underset{B}{|}}{N}-(CHR_1)_x)_y-\underset{\underset{B}{|}}{N}-Q \qquad (I)$$

wherein R is a hydrocarbon group having 7–22 carbon atoms, n is 0 or 1, A is a carbonyl group (C(O)), a group $(OCH_2CH_2)_z$ or a group $(OCH_2CH_2CH_2)_z$ in which z is an integer from 1 to 5, R_1 is hydrogen or a lower alkyl group, x is 2 or 3, y is an integer from 0 to 4, Q is the group $-R_2COOM$ in which R_2 is an alkylene group having 1–6 carbon atoms and M is hydrogen or an ion from the groups alkali metals, alkaline-earth metals, ammonium and substituted ammonium, and B is hydrogen or a group Q as defined above,

b) at least one amphoteric surface-active compound of type b) having the general formula (III) or (IV)

$$R-\overset{\overset{R'}{|}}{\underset{\underset{R'}{|}}{N^+}}-(CH_2)_nCOOM \qquad (III)$$

$$R-\overset{\overset{O}{\|}}{C}-NH-(CH_2)_3-\overset{\overset{R'}{|}}{\underset{\underset{R'}{|}}{N^+}}-(CH_2)_nCOOM \qquad (IV)$$

wherein R is a longer hydrophobic hydrocarbon group having at least 7 carbon atoms, R' is an alkyl or hydroxyalkyl group having 1–4 carbon atoms, n is 1 or 2, and M is hydrogen or a sodium ion,

c) at least one non-ionic surface-active compound consisting of an ethoxylated and/or propoxylated adduct of a fatty alcohol, and

d) at least one anionic surfactant,

wherein the total amount of amphoteric compounds of type a) and type b) and ethoxylated and/or propoxylated fatty alcohol is 20 to 70% by weight, based on the anionic surfactant, and the weight ratio of ethoxylated and/or propoxylated fatty alcohol to the total amount of amphoteric surface-active compounds is from 1:1–2:1.

5,589,448

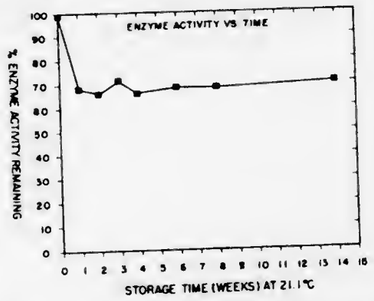
HIGH WATER LIQUID ENZYME PREWASH COMPOSITION

Michael Koerner, Pleasanton, and David L. Deleeuw, San Ramon, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 18,621, Feb. 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,353

Int. Cl.[6] **C11D** *3/386*

U.S. Cl. 510—284 **15 Claims**



1. A high water liquid enzyme prewash composition without hydrotropes, organic solvents and surfactants, other than nonionic surfactants, said composition consisting essentially of:

a) about 0.0001–10% of a hydrolase enzyme stabilized with about 1–10,000 ppm of a soluble alkaline earth salt;

b) about 0.1–9.99% of a more hydrophilic, first nonionic surfactant having an HLB of greater than about 11;

c) about 0.1–9.99% of a more hydrophobic, second nonionic surfactant having an HLB of less than or equal to about 11;

d) about 80–99% water;

wherein the difference in HLB between said first and second nonionic surfactants is at least 2, and said nonionic surfactants interact with said water to form an opalescent, structured liquid, said structured liquid both suspending said hydrolase and protecting said hydrolase against deactivation with said water wherein first and second nonionic surfactants are selected from the groups consisting of C_5–C_{20} alcohols with 1–20 mole of ethylene oxide, propylene oxide or mixtures of ethylene oxide and propylene oxide and alkoxylated alkyl phenols.

5,589,449

PARTICULATE FOAM CONTROL AGENTS

Leonidas Kolaitis, Meise; Bertrand L. J. Lenoble, Bois-de-Lessines, and Mark A. Prince, Overijse, all of Belgium, assignors to Dow Corning S.A., Seneffe, Belgium

Filed Jul. 22, 1994, Ser. No. 279,755

Claims priority, application United Kingdom, Jul. 29, 1993, 9315675; Jan. 14, 1994, 9400599

Int. Cl.[6] **B01D** *19/04;* **C11D** *3/20*

U.S. Cl. 510—466 **19 Claims**

1. A particulate foam control agent comprising from 1 to 30 parts by weight of a silicone antifoam, from 70 to 99 parts by weight of a zeolite carrier for the antifoam, from 1 to 60% by weight of the silicone antifoam of an organopolysiloxane polyoxyalkylene copolymer, which has been deposited onto the zeolite carrier not later than the silicone antifoam and from 1 to 40 parts by weight of a polycarboxylate-type binder or encapsulant.

19. A detergent composition in powder form which comprises 100 parts by weight of a detergent component and sufficient of a foam control agent according to claim 1 to give 0.05 to 5 parts by weight of the silicone antifoam comprised in the foam control agent.

5,589,450

PROCESS FOR THE PRODUCTION OF WATER-FREE DETERGENT MIXTURES

Raphael Pi, Granollers; Joaquim Bigorra-Losas, Sabadell; Oriol Ponsati-Obiols, Barcelona, all of Spain, and Karl Schmid, Mettmann, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/00392, § 371 Date Sep. 15, 1995, § 102(e) Date Sep. 15, 1995, PCT Pub. No. WO94/19313, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 11, 1994, Ser. No. 505,305

Claims priority, application Germany, Feb. 19, 1993, 43 05 083.2

Int. Cl.[6] **C11D** *3/28;3/30;1/72*

U.S. Cl. 510—535 **16 Claims**

1. A process for the production of a water-free detergent mixture comprising reacting at least one secondary or tertiary amine selected from the group consisting of

(i) a compound of the formula (I):

$$R^1-\overset{\overset{R2}{|}}{N}-R^3 \qquad (I)$$

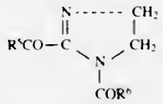
wherein R^1 is an alkyl or alkenyl radical having from about 6 to about 22 carbon atoms, R^2 is hydrogen or an alkyl radical having from 1 to about 4 carbon atoms and R^3 is an alkyl radical having from 1 to about 4 carbon atoms,

(ii) a compound of the formula (II):

$$R^4CO-NH-(CH_2)_n-\overset{\overset{R^2}{|}}{N}-R^3 \qquad (II)$$

wherein R^4CO is an aliphatic acyl radical having from about 6 to about 22 carbon atoms and 0 or 1 to 3 double bonds, n is 0 or a number of 1 to 3 and R^2 and R^3 are as defined above, and

(iii) a compound of the formula (III):



(III)

wherein each of R^5CO and R^6CO is independently an aliphatic acyl radical having from about 6 to about 22 carbon atoms and 0 or 1 to 3 double bonds with an alkylating agent which is a halocarboxylic acid or an alkali metal salt or ester thereof in the presence of at least one fatty alcohol polyglycol ether having an HLB value of from about 6 to about 12 and having the formula (IV):

$$R^7O(CH_2CHO)_n\overset{\overset{R^8}{|}}{}H \qquad (IV)$$

wherein R^7 is an alkyl radical having from about 8 to about 14 carbon atoms, R^8 is hydrogen or a methyl group and n is a number of 1 to 10:

wherein the reaction is carried out in the absence of water or any additional organic solvents.

5,589,451

METHODS AND TREAMENTS FOR CORNEAL HEALING WITH HEPATOCYTE AND KERATINOCYTE GROWTH FACTORS

Steven E. Wilson, Plano, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 21, 1992, Ser. No. 947,683

Int. Cl.[6] **A61K** *38/18;* **C12N** *5/06;* **C07K** *14/485;14/475*

U.S. Cl. 512—2 **13 Claims**

1. A method for promoting corneal cell proliferation or maintaining corneal cell viability in vivo comprising treating the corneal cells with an amount of hepatocyte growth factor to stimulate growth in a pharmaceutically acceptable composition.

5,589,452

ANALOGS OF PARATHYROID HORMONE AND PARATHYROID HORMONE RELATED PEPTIDE: SYNTHESIS AND USE FOR THE TREATMENT OF OSTEOPOROSIS

John L. Krstenansky, Palo Alto; John J. Nestor, Jr., Cupertino; Teresa H. Ho, Los Altos; Brian H. Vickery, Mountain View, and Chinh T. Bach, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 14, 1992, Ser. No. 915,247

Int. Cl.[6] **A61K** *38/29;* **C07K** *14/635*

U.S. Cl. 514—12 **37 Claims**

1. A modified parathyroid honnone related polypeptide (PTHrP), of the formula:

Ala Val Ser Glu Xaa^5 Gln Leu Leu His Asp Xaa^{11} Gly Xaa^{13} Ser Ile

Gln Asp Leu Xaa^{19} Arg Xaa^{21} Xaa^{22-31} Xaa^{32} Xaa^{33} Xaa^{34} Term, wherein:

Xaa^5 is His or Ala;

Xaa^{11} and Xaa^{13} are independently Lys, Arg, or Leu;

Xaa^{19} and Xaa^{21} are independently Ala or Arg;

Xaa^{22-31} is selected from the group consisting of (SEQ ID NOS: 26, 27, 28, 29, and 30);

Xaa^{32} is His or Lys;

Xaa^{33} is Thr, Glu, or Ala;

Xaa^{34} is Ala, hSer, Tyr, or Leu;

Term is OH, NR_2, lactone, or Gly Arg Arg, where R is H or $(C_1$–$C_4)$ alkyl; and the pharmaceutically acceptable salts thereof.

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5,589,453

HUMAN RHINOVIRUS RECEPTOR PROTEIN (ICAM-1) THAT INHIBITS RHINOVIRUS ATTACHMENT AND INFECTIVITY

Jeffrey M. Greve, Branford, Conn., assignor to Molecular Therapeutics, Inc., West Haven, Conn.

Continuation of Ser. No. 139,622, Oct. 19, 1993, abandoned, which is a continuation of Ser. No. 14,087, Feb. 4, 1993, abandoned, which is a continuation of Ser. No. 239,571, Sep. 1, 1988, abandoned. This application Sep. 30, 1994, Ser. No. 316,383

Int. Cl.[6] A61K *38/17;39/00;* **C07K** *14/705*

U.S. Cl. 514—8 **6 Claims**

1. A method for reducing the infection by human rhinovirus (HRV) of a host cell susceptible to infection by HRV, comprising contacting the virus under conditions favorable for binding with an antiviral agent selected from the group consisting of human rhinovirus major receptor protein (HRR) and fragments thereof in a form that exhibits the ability to bind to HRV capsids and reduce infectivity of the virus.

5,589,454

Patent Not Issued For This Number

5,589,455

CYCLOSPORIN-CONTAINING SOFT CAPSULE COMPOSITIONS

Jong S. Woo, Kyunggi-do, Rep. of Korea, assignor to Hanmi Pharm. Ind. Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Apr. 21, 1995, Ser. No. 427,187

Claims priority, application Rep. of Korea, Dec. 28, 1994, 94-37948

Int. Cl.[6] A61K *37/00*

U.S. Cl. 514—11 **14 Claims**

1. A cyclosporin-containing soft capsule composition which comprises:

(1) cyclosporin as an active ingredient,

(2) polyethylene glycol having a molecular weight of 200 to 600 as a cosurfactant,

(3) a mixture of an esterified compound of fatty acid and primary alcohol, medium chain fatty acid triglyceride and fatty acid monoglyceride as an oil component, and

(4) a surfactant having HLB (Hydrophilic-lipophilic balance) value of 10 to 17.

5,589,456

GRANULOCYTE-COLONY STIMULATING FACTOR RECEPTORS

Craig A. Smith; Alf D. Larsen; John E. Sims, and Benson M. Curtis, all of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Division of Ser. No. 6,183, Jan. 15, 1993, Pat. No. 5,422,248, which is a continuation of Ser. No. 587,329, Sep. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 522,952, Apr. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 416,306, Oct. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 412,816, Sep. 26, 1989, abandoned. This application Feb. 2, 1995, Ser. No. 382,771

Int. Cl.[6] C12N *15/19;* **A61K** *38/19;* **C07K** *14/715*

U.S. Cl. 514—12 **2 Claims**

1. A purified biologically active Granulocyte Colony Stimulating Factor receptor (G-CSFR), selected from the group consisting of:

(a) a G-CSFR having an amino acid sequence comprising amino acids 1 through 759 of FIGS. 2A–2B;

(b) a G-CSFR having an amino acid sequence comprising amino acids 1 through 725 of FIGS. 2A–2B followed by amino acids 726– 776 of FIG. 3;

(c) a biologically active G-CSFR identical to the G-CSFR molecules of (a) or (b) except for modification(s) to the amino acid sequence selected from the group consisting of: inactivated N-linked glycosylation sites; altered KEX2 protease cleavage sites; and conservative amino acid substitutions; and

(d) soluble forms of the G-CSFR according to (a), (b) or (c), consisting of the extracellular domain of G-CSFR,

which G-CSFR molecules exhibit biological activity in an assay selected from the group consisting of a G-CSFR membrane binding assay, a G-CSFR solid phase binding assay, a G-CSFR whole cell binding assay, and a binding assay for soluble G-CSFR.

5,589,457

PROCESS FOR THE SYNCHRONIZATION OF OVULATION

Milo Wiltbank, Madison, and James R. Pursley, Sun Prairie, both of Wis., assignors to Ausa International, Inc., Tyler, Tex.

Filed Jul. 3, 1995, Ser. No. 498,691

Int. Cl.[6] A61K *38/24;31/19*

U.S. Cl. 514—12 **40 Claims**

1. A method for synchronizing ovulation in cattle, the steps comprising:

(a) administering a first dose of a hormone selected from the group consisting of a gonadotropin releasing hormone (GnRH), a luteinizing hormone (LH) and a human chorionic gonadotropin (hCG), to an open cow during an estrous cycle in an amount effective to stimulate ovarian follicle development;

(b) subsequent to step (a) and after a period of time sufficient for development of a dominant follicle, administering a dose of prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) in an amount effective to initiate corpus luteum regression;

(c) concomitantly with or within a period of 3 days subsequent to step (b), administering a second dose of a hormone selected from the group consisting of LH, hCG and GnRH to stimulate ovulation of said follicle; and

(d) concomitantly with or within one day prior to or subsequent to step (c), breeding said cow.

5,589,458

COMPOUNDS THAT INHIBIT T CELL PROLIFERATION AND METHODS FOR USING THE SAME

Bradford A. Jameson; James M. McDonnell, both of Philadelphia, Pa., and Robert Korngold, Cherry Hill, N.J., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 977,692, Nov. 13, 1992, abandoned. This application Jun. 11, 1993, Ser. No. 76,092

Int. Cl.[6] A61K *38/00;38/04;* **C07K** *5/00;7/00*

U.S. Cl. 514—13 **27 Claims**

1. A compound consisting of 20 amino acids or less including Lys-Glu-Glu; wherein said compound inhibits T cell proliferation.

19. A method of treating an individual suffering from or being susceptible to multiple sclerosis, graft rejection or graft versus host disease comprising the step of administering to said individual a pharmaceutical composition comprising:

a) a therapeutically effective amount of a compound according to claim 1; and

b) a pharmaceutically acceptable carrier or diluent.

5,589,459

SYNTHETIC PEPTIDES FOR DETOXIFICATION OF BACTERIAL ENDOTOXINS AND FOR THE PREVENTION AND TREATMENT OF SEPTIC SHOCK

Massimo Porro, Siena, Italy, assignor to BiosYnth s.r.l., Siena, Italy

Division of Ser. No. 819,893, Jan. 16, 1992, Pat. No. 5,371,186, which is a continuation-in-part of Ser. No. 658,744, Feb. 11, 1991, abandoned. This application Jul. 26, 1994, Ser. No. 280,397

Int. Cl.[6] A61K *38/00;38/12;* **C07K** *5/00;7/00*

U.S. Cl. 514—15 **14 Claims**

1. A method for the removal of endotoxin from human and animal blood sera which comprises contacting said blood or sera with a peptide of which is a monomeric, linear polymeric, cyclic monomeric or cyclic polymeric peptide of the formula:

$$R_1\text{—}(A\text{—}B\text{—}C)_n\text{—}R \qquad (I)$$

wherein R_1 and R are independently H or an amino acid residue or a fatty acid residue; A is an amino acid residue selected from the group consisting of Lys and Arg; B is an amino acid selected from the group consisting of Phe, Tyr and Trp; C is an amino acid selected from the group consisting of Leu, Ile and Val; n is an integer of from 1–100, in an amount which is effective for the removal of endotoxin from said blood or sera.

5,589,460

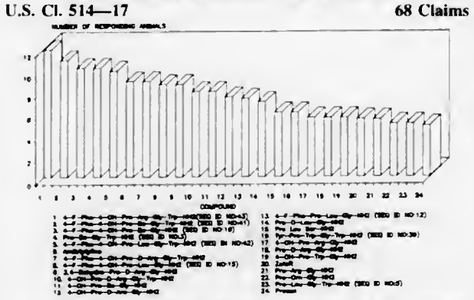
TRI-, TETRA-, PENTA-, AND POLYPEPTIDES AND THEIR THERAPEUTIC USE AS AN ANTIDEPRESSANT AGENT

Henry B. Abajian, Hillsdale, N.J.; John F. Noble, Pomona, and Joseph J. Hlavka, Tuxedo Park, both of N.Y., assignors to Innapharma, Inc., Suffern, N.Y.

Filed May 4, 1994, Ser. No. 238,089

Int. Cl.[6] A61K *38/04;38/07;* **C07K** *5/04;7/06*

U.S. Cl. 514—17 **68 Claims**



1.A tripeptide composition or salt thereof, comprising a general formula (1):

$$R^1\text{-}Pro^1\text{-}AA^1\text{-}NR^2\text{—}CH_2\text{—}R \qquad (1)$$

where Pro^1 represents an amino acid selected from the group consisting of Pro and dehydro-Pro; AA^1 represents an amino acid selected from the group consisting of Trp, Orn, Lys, Leu, Arg, D-Arg, and Ile; R is selected from the group consisting of a carboxyl group, a hydroxyalkyl group, a carbamyl group and an alkoxycarbonyl group; R^1 is selected from the group consisting of a hydrogen atom, a lower alkyl group having 1 to 3 carbon atoms, a halogen atom, a hydroxyl group, a sulphydryl group, an alkylamino group, and a dialkylamino group; and, R^2 is selected from the group consisting of a hydrogen atom and a lower alkyl group having 1 to 3 carbon atoms, with the provisos that: where Pro^1 is Pro and AA^1 is Leu, Ile, Lys, Arg, or Orn, then R^1 and R^2 cannot both be a hydrogen atom when R is a carbamyl group; where Pro^1 is dehydro-Pro and AA^1 is Leu, then R^1 and R^2 cannot both be a hydrogen atom when R is a carbamyl group; where Pro^1 is Pro and AA^1 is Leu, R^1 and R^2 cannot both be a hydrogen atom when R is either a carboxyl group or a hydroxyalkyl group; and, where Pro^1 is Pro and AA^1 is Trp, R^1 and R^2 cannot be a hydrogen atom when R is a hydroxyalkyl group.

5,589,461

ACTIVE SUBSTANCE FOR INHIBITING THE PROLIFERATION RATE OF HEPATOCYTES

G. Ruhenstroth-Bauer, Spitzelbergerstrasse 11, 82166 Gräfelfing, Germany

Filed May 17, 1994, Ser. No. 243,873

Int. Cl.[6] C07K *5/08;5/10;5/06*

U.S. Cl. 514—18 **3 Claims**

1. A method of inhibiting the proliferation rate of hepatocytes in a subject, comprising the step of:

administering the free tripeptide of the composition SDK (serine-aspartic acid-lysine) or the salt thereof for treating the subject by administering a therapeutically effective amount to a subject in need thereof.

5,589,462

METHOD OF PREPARING A BIOLOGICAL ADHESIVE ENRICHED WITH PLATELET FACTORS, AND APPLICATION

Jean-Louis Patat, Paris; Olivier Delmas, Montbazon, and Roland Schmitthaeusler, Montigny-le-Bretonneux, all of France, assignors to Inoteb, Saint-Gonnery, France

PCT No. PCT/FR93/00954, § 371 Date Jul. 15, 1994, § 102(e) Date Jul. 15, 1994, PCT Pub. No. WO94/07548, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 30, 1993, Ser. No. 244,253

Claims priority, application France, Sep. 30, 1992, 92 11643

Int. Cl.[6] A61K *38/18;35/16;* **C07K** *14/49;1/30*

U.S. Cl. 514—21 **16 Claims**

1. A method of preparing a platelet factor-enriched biological adhesive, comprising:

(a) freezing a platelet-enriched plasma; and

(b) isolating a cryoprecipitate from the frozen platelet-enriched plasma.

5,589,463

ORAL DELIVERY OF BIOLOGICALLY ACTIVE SUBSTANCES BOUND TO VITAMIN B12

Gregory J. Russell-Jones, Willoughby; Peter Howe, West Pennant Hills; Henry J. de Aizpurua, Bexley, and Geoffery L. Burge, Thornleigh, all of Australia, assignors to Biotechnology Autralia Pty., Ltd., Roseville, Australia

Division of Ser. No. 61,343, May 17, 1993, Pat. No. 5,428,023, which is a continuation of Ser. No. 759,697, Sep. 9, 1991, abandoned, which is a continuation of Ser. No. 600,137, Oct. 19, 1990, abandoned, which is a continuation of Ser. No. 84,821, Jun. 9, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 479,635

Claims priority, application Australia, Oct. 10, 1985, PH2838

Int. Cl.[6] A61K *31/715;39/385;* **C07H** *23/00*

U.S. Cl. 514—21 **10 Claims**

1. An orally administrable complex comprising an antigen or hapten that is covalently linked via a cross-linking agent to a vitamin B12 carrier molecule, wherein

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(A) said carrier molecule is capable of binding in vivo to intrinsic factor, thereby enabling uptake and transport of the complex from the intestinal lumen of a vertebrate host via intrinsic factor to the systemic circulation of said host, and

(B) said cross-linking agent links said antigen or hapten to a carboxyl group of an acid-hydrolyzed propionamide side chain adjacent to ring A, ring B or ring C of said carrier molecule, and

said antigen or hapten is an allergen, protein, polysaccharide or secretory product selected from the group consisting of polysaccharides, grass pollen, weed pollen, tree pollen, plant pollen, cat hair, dog hair, pig hair, other epithelia, house dust mite, wheat chaff, kapok, a protein from or immunogens against influenza, measles, Rubella, smallpox, yellow fever, diphtheria, tetanus, cholera, plague, typhus, BCG, tuberculosis causing agents, *Haemophilus influenzae*, *Neisseria catarrhalis*, *Klebsiella pneumoniae*, pneumococci, streptococci, a malarial parasite or the causative agent of coccidiosis in chickens, a secretory product from diphtheria, tetanus, cholera, plague, typhus, tuberculosis causing agents, *Haemophilus influenzae*, *Neisseria catarrhalis*, *Klebsiella pneumoniae*, pneumococci, streptococci, and *Streptococcus mutans*.

5,589,464

USE OF 2-SUBSTITUTED-THIAZOLIDINE-4-CARBOXYLIC ACIDS FOR TREATMENT OF CATARACT

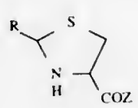
William H. Garner, Southlake, and Larry A. Wheeler, Irvine, both of Calif., assignors to Allergan, Waco, Tex.

Division of Ser. No. 938,967, Sep. 1, 1992, Pat. No. 5,399,573. This application Sep. 30, 1994, Ser. No. 316,596

Int. Cl.[6] A61K *31/70;31/435;31/425;31/38*

U.S. Cl. 514—23 **4 Claims**

1. A method for delaying the onset of cataract in mammals comprising administering to said mammal a composition having a therapeutically effective amount of a compound of the formula:



R is hydrogen, hydroxy, aliphatic(C_{1-20}), $(CH_2)_n$-Q, where n is 0–20 and Q is phenyl, thienyl, furyl, pyridyl, or $(CH_2)_n$-T where n is 0–20 and T is an aliphatic ring of 3 to 7 carbon atoms, or =O or a ketal of 2–5 carbons, or hydroxy, or O-aliphatic (C_{1-10}), or $N(R_1)_2$ where R_1 is hydrogen or alkyl of 1 to 5 carbons, or thiazolidine, or a sugar; and Z is -OH or a pharmaceutically acceptable salt thereof, OR_3 where R_3 is an aliphatic group of 1–10 carbons, $N(R_1)_2$ when R_1 is hydrogen or alkyl of 1–5 carbon atoms.

5,589,465

GLYCOLIPID DERIVATIVES ACTING AS LIGANDS FOR SELECTINS

Hideharu Ishida, Gifu; Makoto Kiso, Motosu-gun, and Akira Hasegawa, 1735-160 Kano, Gifushi, Gifu-ken, all of Japan, assignors to Akira Hasegawa, and Kanebo Ltd., both of Japan

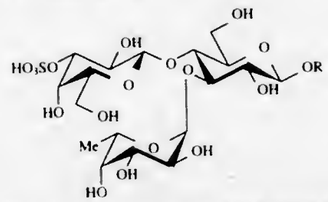
Filed Mar. 1, 1995, Ser. No. 396,793

Claims priority, application Japan, Sep. 30, 1994, 6-261557

Int. Cl.[6] A61K *31/70;* **C07H** *3/06;11/00;15/04*

U.S. Cl. 514—25 **9 Claims**

1. A glycolipid derivative of Formula (I):



(I)

wherein R is 2-(tetradecyl) hexadecyl, in the form of a pharmaceutically acceptable salt.

5,589,466

INDUCTION OF A PROTECTIVE IMMUNE RESPONSE IN A MAMMAL BY INJECTING A DNA SEQUENCE

Philip L. Felgner, Rancho Santa Fe, Calif.; Jon A. Wolff, Madison, Wis.; Gary H. Rhodes, Leucadia, Calif.; Robert W. Malone, Chicago, Ill., and Dennis A. Carson, Del Mar, Calif., assignors to Vical Incorporated, San Diego, Calif., and Wisconsin Alumni Research Foundation, Dane, Wis.

Continuation of Ser. No. 8,197, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 496,991, Mar. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 467,881, Jan. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 326,305, Mar. 21, 1989, abandoned. This application Jan. 26, 1995, Ser. No. 380,131

Int. Cl.[6] A61K *48/00;* **C12N** *15/00*

U.S. Cl. 514—44 **11 Claims**

1. A process for inducing a protective immune response in a mammal, comprising:

injecting into muscle or skin of said mammal a construct comprising a noninfectious, nonintegrating DNA sequence encoding an immunogen linked to a promoter sequence which can control the expression of said DNA sequence in said mammal, in an amount sufficient that uptake of said construct occurs, and sufficient expression results, to induce said protective immune response,

wherein said construct is free from association with transfection-facilitating viral particles, liposomal formulations or charged lipids.

5,589,467

2,5',N6-TRISUBSTITUTED ADENOSINE DERIVATIVES

Jesper Lau, Farum, and Lars J. S. Knutsen, Vedbæk, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

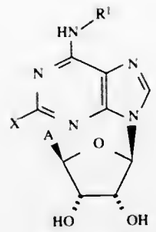
Filed Sep. 14, 1994, Ser. No. 306,232

Claims priority, application Denmark, Sep. 17, 1993, 1043/93; Mar. 16, 1994, 0310/94

Int. Cl.[6] A61K *31/70;* **C07H** *19/67*

U.S. Cl. 514—46 **14 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof



(I)

wherein

X is halogen, amino, perhalomethyl, cyano, C_{1-6}-alkoxy, C_{1-6}-alkylthio or C_{1-6}-alkylamino;

A is methyl, halomethyl, cyanomethyl, aminomethyl, vinyl, methylthiomethyl or methoxymethyl; and

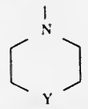
R^1 is selected from the group consisting of

(i) a ring of formula (a)

(a)

wherein Q is nitrogen, n is 2 and the ring of formula (a) is unsubstituted or substituted with one or two C_{1-6}-alkyl groups, C_{2-6}-alkenyl, C_{2-6}-alkynyl, phenoxy, phenylsulphonyl, phenylsulphinyl, phenylthio, hydroxy, phenyl, C_{1-6}-alkoxy, C_{1-6}-alkoxy-C_{1-6}-alkyl, or phenylthioalkyl,

(ii) a ring of formula (b)



(b)

wherein Y is O, S or NZ, wherein Z is H, C_{1-6}-alkyl or phenyl, and wherein the ring of formula (b) is unsubstituted or substituted with C_{1-6}-alkyl, C_{2-6}-alkenyl, C_{2-6}-alkynyl, phenoxy, phenyl, C_{1-6}-alkoxy or C_{1-6}-alkoxy-C_{1-6}-alkyl, and

(iii) $—NR^2R^3$ or $—Y^2R^4$, wherein Y^2 is oxygen or sulphur; R^2 is C_{1-6}-alkyl; R^3 is phenyl or C_{1-6}-alkyl which is unsubstituted or substituted by phenyl or phenoxy; and R^4 is C_{1-6}-alkyl or C_{3-8}-cycloalkyl, each of which is unsubstituted or substituted by phenyl or phenoxy.

5,589,468

METHOD FOR PROVIDING NUTRITION TO ELDERLY PATIENTS

Paul M. Lin, Fullerton, Calif.; Shen-Youn Chang, Wadsworth, and Chris Kruzel, Wheeling, both of Ill., assignors to Clintec Nutrition Co., Deerfield, Ill.

Filed Jan. 13, 1995, Ser. No. 372,558

Int. Cl.[6] A01N *43/04;45/00;43/60;43/08*

U.S. Cl. 514—52 **20 Claims**

1. A method for providing nutrition to an elderly patient comprising enterally administering to the patient an effective amount of a composition comprising:

a protein source including at least 18% of the calorie distribution of the composition;

a carbohydrate source; and

a lipid source including a mixture of medium and long chain triglycerides.

5,589,469

SUBSTITUTED 1H-3-ARYL-PYRROLIDINE-2,4-DIONE DERIVATIVES

Reiner Fischer, Monheim; Bernd-Wieland Krüger, Bergisch Gladbach; Thomas Bretschneider, Siegburg; Christoph Erdelen, Leichlingen; Ulrike Wachendorff-Neumann, Monheim; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

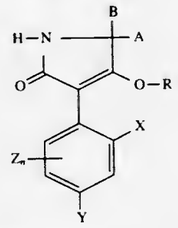
Continuation of Ser. No. 166,669, Dec. 14, 1993, abandoned, which is a continuation of Ser. No. 901,051, Jun. 19, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,913

Claims priority, application Germany, Jun. 28, 1991, 41 21 365.3

Int. Cl.[6] A01N *43/36;57/16;* **C07D** *207/273;* **C07F** *9/572*

U.S. Cl. 514—91 **8 Claims**

1. A substituted 3-aryl-pyrrolidine-2,4-dione derivative of the general formula



(I)

in which

X represents C_{1-6}-alkyl,

Y represents C_{1-6}-alkyl,

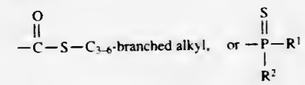
Z represents C_{1-6}-alkyl,

n represents a number from 0–3,

A and B independently represent hydrogen, or C_{1-4}-alkyl, or in which

A and B together with the carbon atom to which they are bonded represent cyclohexyl,

R represents



in which

R^1 and R^2 independently of each other represent C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio, and

the pure enantiomeric forms of compounds of the formula (I).

5,589,470

REDUCING TETRACYCLINE RESISTANCE IN LIVING CELLS

Stuart B. Levy, Boston, Mass., assignor to Trustees of Tufts College, Medford, Mass.

PCT No. PCT/US92/08965, § 371 Date Jun. 14, 1994, § 102(e) Date Jun. 14, 1994, PCT Pub. No. WO93/08806, PCT Pub. Date May 13, 1993

Continuation-in-part of Ser. No. 788,693, Nov. 6, 1991, abandoned, which is a continuation of Ser. No. 672,323, Mar. 20, 1991, Pat. No. 5,258,372, and Ser. No. 484,904, Feb. 26, 1990, Pat. No. 5,064,821. This PCT application Oct. 16, 1992, Ser. No. 232,247

Int. Cl.[6] A61K *31/65*

U.S. Cl. 514—154 **27 Claims**

1. A pharmaceutical composition for converting tetracycline resistant bacteria into tetracycline sensitive bacteria comprising a

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C5 ester of tetracycline and a tetracycline-type antibiotic which is not a C5 ester of tetracycline, and a pharmaceutically acceptable carrier.

5,589,471

VITAMIN D ANALOGUES CONTAINING A HYDROXY OR ALKYLATED HYDROXY GROUP IN THE 20-POSITION

Kai Hansen, Herley, and Claus Aage S. Bretting, Frederiksberg, both of Denmark, assignors to Fabrik Produktionsaktieselskab Leo Pharmaceutical Products Ltd., Ballerup, Denmark

PCT No. PCT/DK93/00311, § 371 Date Jan. 3, 1995, § 102(e) Date Jan. 3, 1995, PCT Pub. No. WO94/07842, PCT Pub. Date Apr. 14, 1994

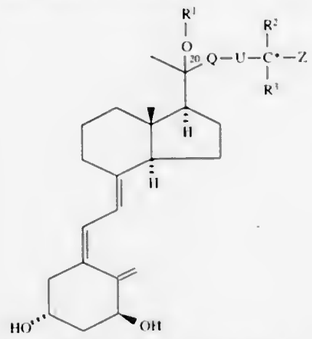
PCT Filed Sep. 27, 1993, Ser. No. 362,550

Claims priority, application United Kingdom, Sep. 28, 1992, 9220439

Int. Cl.[6] **A61K** *31/59;* **C07C** *401/00*

U.S. Cl. 514—167 **9 Claims**

1. A compound of the formula I



in which formula Q is a $—CH_2—$, —CH=CH— or —C≡C—; U is a C_1–C_6 alkylene; R^1 is hydrogen, a C_1–C_4 alkyl or YR' in which Y stands for the radicals —SO— or $—SO_2—$ and R' stands for a C_1–C_4 alkyl; R^2 and R^3 are independently hydrogen or C_1–C_4 alkyl, and additionally R^2 and R^3, when taken together with the starred carbon atom, may form a C_3–C_6 carbocyclic ring; Z is hydrogen or hydroxy; and prodrugs of I in which one or more of the hydroxy groups are masked as groups which can be reconverted to hydroxy groups in vivo.

5,589,472

DIINDOLO COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Susan F. Vice, 1144 Sawmill Rd., Mountainside, N.J. 07092

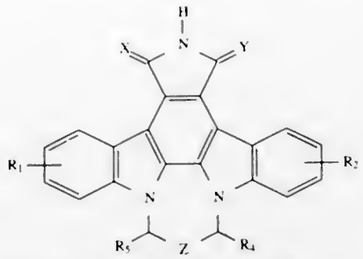
PCT No. PCT/US93/08276, § 371 Date Mar. 10, 1995, § 102(e) Date Mar. 10, 1995, PCT Pub. No. WO94/07895, PCT Pub. Date Apr. 14, 1994

Continuation-in-part of Ser. No. 951,052, Sep. 25, 1992, abandoned. This PCT application Sep. 9, 1993, Ser. No. 397,205

Int. Cl.[6] **C07D** *498/22;* **A61K** *31/55;31/38*

U.S. Cl. 514—183 **17 Claims**

1. A compound of the formula



I

or pharmaceutically acceptable salts thereof, wherein

X and Y are independently =O, =NH, (H,H) or (H,OH);

R_1 and R_2, are independently —H, —OH, —Cl, —F, $—OCH_3$, or $—CH_3$;

Z is O, S, SO, or SO_2;

n is 1 or 2;

m is 0, 1, 2 or 3;

R_4 and R_5 are the same or different and each independently is selected from the group consisting of H, $—(CH_2)_pOH$, $—(CH_2)_qNH_2$, $—(CH_2)_rNHCH_3$, $—(CH_2)_sN(CH_3)_2$, $—(CH_2)_tOCH_3$, $—(CH_2)_uCO_2CH_3$, $—CH_2CO_2CH_2CH_3$, $—CH_2CH_2CO_2CH_3$, $—CH_2CH_2CO_2CH_2CH_3$, $—CH_2CH_2CO_2$tert-Bu., $—CH_2CO_2$tert-Bu., $—CH_2CH_2CO_2$tert-Bu., and $—(CH_2)_vCO_2H$ $—(CH_2)_wCONH_2$;

R_6 is —C_1-C_4 alkyl;

p, q, r, s, t, u, v and w are each independently 1 or 2;

with the proviso that when Z is N—R_3, O,

S, or SO, R_4 and R_5 are both H.

5,589,473

MONO- AND BICYCLIC DNA GYRASE INHIBITORS

Jürgen Geiwiz, Lörrach, Germany; Erwin Götschl, Reinach, Switzerland; Paul Hebeisen; Helmut Link, both of Basel, Switzerland, and Thomas Lübbers, Lörrach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

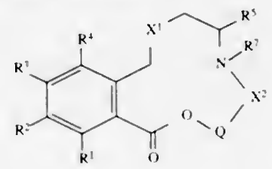
Filed Mar. 20, 1995, Ser. No. 407,730

Claims priority, application European Pat. Off., Mar. 30, 1994, 94104995; Feb. 7, 1995, 95101595

Int. Cl.[6] **C07D** *291/08;* **A61K** *31/395*

U.S. Cl. 514—183 **37 Claims**

1. A compound of the formula



IB

wherein

X^1 is —S—O or —SO—;

R^1 is hydrogen, halogen or optionally substituted lower alkyl, the optional substituent being halogen;

R^2 is hydrogen, hydroxy, amino, lower alkylamino, di-lower alkylamino, optionally substituted lower alkoxy or a group —OP;

OP is an easily hydrolyzable group;

R^3 is hydrogen, hydroxy, lower alkyl, halogen or a group —OP;

R^4 is halogen, hydroxy or a group —OP;

R^5 is hydrogen, cyano, optionally substituted esterified carboxy, optionally substituted amidated (thio)carboxy, optionally substituted alkyl, optionally substituted alkenyl or optionally substituted heterocycle;

R^7 is hydrogen or lower alkyl;

X^2 is (thio)carbonyl;

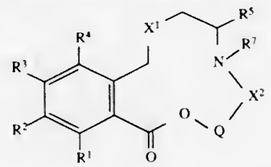
Q is $—CH(R^8)—$ or $—CH(R^8)—W—$;

R^8 is hydrogen or optionally substituted lower alkyl, and

W is optionally substituted di-, tri-, tetra- or pentamethylene; or the

pharmaceutically acceptable salts thereof carrying an acidic and/or basic substituent.

37. A method of treating bacterial infections in a mammal comprising administering to said mammal in need of such treatment an effective amount of a compound of the formula



1B

wherein

X^1 is —S—O or —SO—;

R^1 is hydrogen, halogen or optionally substituted lower alkyl, the optional substituent being halogen;

R^2 is hydrogen, hydroxy, amino, lower alkylamino, di-lower alkylamino, optionally substituted lower alkoxy or a group —OP;

OP is an easily hydrolyzable group;

R^3 is hydrogen, hydroxy, lower alkyl, halogen or a group —OP;

R^4 is halogen, hydroxy or a group —OP;

R^5 is hydrogen, cyano, optionally substituted esterified carboxy, optionally substituted amidated (thio)carboxy, optionally substituted alkyl, optionally substituted alkenyl or optionally substituted heterocycle;

R^7 is hydrogen or lower alkyl;

X^2 is (thio)carbonyl;

Q is $—CH(R^8)—$ or $—CH(R^8)—W—$;

R^8 is hydrogen or optionally substituted lower alkyl, and

W is optionally substituted di-, tri-, tetra- or pentamethylene; or the

pharmaceutically acceptable salts thereof carrying an acidic and/or basic substituent, and a therapeutically inert carrier.

5,589,474

DIBENZOTHIAZEPINTHIONE AS ANTIVIRAL AGENTS

Robin H. Nicol, London; Martin J. Slater, and Simon T. Hodgson, both of Beckenham, all of England, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

PCT No. PCT/GB92/00804, § 371 Date Dec. 6, 1993, § 102(e) Date Dec. 6, 1993, PCT Pub. No. WO92/19607, PCT Pub. Date Nov. 12, 1992

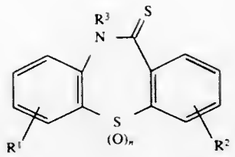
PCT Filed May 1, 1992, Ser. No. 140,122

Claims priority, application United Kingdom, May 2, 1991, 9109497

Int. Cl.[6] **A61K** *31/55;* **C07D** *267/20*

U.S. Cl. 514—211 **10 Claims**

1. A method of treating a viral infection which comprises administering to a person in need of same an effective amount of a compound of formula (I)



(I)

wherein:

n is 0, 1 or 2; and

R^1 and R^2, which may be the same or different, each represent one or more ring substituent(s) selected from:

hydrogen, hydroxy, halogen, cyano, nitro, C_{1-6}alkyl, C_{3-6}cycloalkyl or C_{1-6}alkoxy (where the alkyl or cycloalkyl moiety may be optionally substituted by one or more substituents selected from halogen atoms and hydroxyl groups);

$—NR^4R^5$ where R^4 and R^5, which may be the same or different, each represent hydrogen or C_{1-6}alkyl;

$—S(O)R^6$, where m is 0, 1, 2 or 3 and R^6 represents hydrogen, C_{1-6}alkyl or C_{3-6} cycloalkyl;

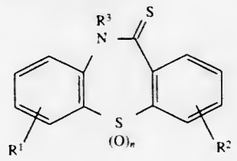
$—SO_2NR^4R^5$ where R^4 and R^5 are each as defined above;

phenyl, phenylC_{1-3}alkoxy or phenylC_{1-3}alkyl where the phenyl group may be optionally substituted by one or more substituents independently selected from C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, nitro, halogen and amino; and

$—CO_2H$ or $—COR^7$ where R^7 is C_{1-6}alkyl or C_{3-6}cycloalkyl;

R^3 represents hydrogen or C_{1-4}alkyl; or an ester, salt or salt of such ester thereof.

5. A compound of formula (I)



(I)

wherein:

n is 0, 1 or 2; and

R^1 and R^2, which may be the same or different, each represent one or more ring substituent(s) selected from:

hydrogen, hydroxy, halogen, cyano, nitro, C_{1-6}alkyl, C_{3-6}cycloalkyl or C_{1-6}alkoxy (where the alkyl or cycloalkyl moiety may be optionally substituted by one or more substituents selected from halogen atoms and hydroxyl groups);

$—NR^4R^5$ where R^4 and R^5, which may be the same or different, each represent hydrogen or C_{1-6}alkyl;

$—S(O)R^6$, where m is 0, 1, 2 or 3 and R^6 represents hydrogen, C_{1-6}alkyl or C_{3-6} cycloalkyl;

$—SO_2NR^4R^5$ where R^4 and R^5 are each as defined above;

phenyl, phenylC_{1-3}alkoxy or phenylC_{1-3}alkyl where the phenyl group may be optionally substituted by one or more substituents independently selected from C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, nitro, halogen and amino; and

$—CO_2H$ or $—COR^7$ where R^7 is C_{1-6}alkyl or C_{3-6}cycloalkyl;

R^3 represents hydrogen or C_{1-4}alkyl; with the proviso that when R^3 is hydrogen and n is zero, then at least one ring substituent R^1 or R^2 is other than hydrogen and that when there is only a single ring substituent R^1 or R^2 other than hydrogen then this substituent is not a chlorine atom in the 2-, 7-, or 8-position; or an ester, salt or other physiologically functional derivative thereof.

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5,589,475

BENZODIAZEPINE TREATMENT

Ernir Snorrason, Stigahlid 80, 105 Reykjavík, Iceland

Continuation of Ser. No. 883,037, May 14, 1992, abandoned.

This application Aug. 22, 1994, Ser. No. 292,230

Claims priority, application Iceland, May 14, 1991, 3706; Denmark, Feb. 13, 1992, 182/92

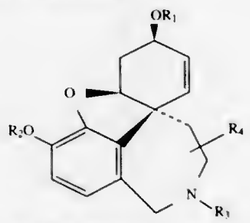
Int. Cl.[6] A01N *43/46*

U.S. Cl. 514—215 **42 Claims**

1. A method for counteracting the sedative, hypnotic or respiratory depressive effects of benzodiazepines, substantially without interfering with the anxiolytic, antipsychotic, anticonvulsant, and muscle relaxant activity of benzodiazepines, comprising the steps of

administering, to a patient subjected to benzodiazepine therapy, an effective amount of galanthamine or a galanthamine derivative of the formula I

I



wherein R^1 and R^2 represents a hydrogen atom or an acyl group, and wherein R^1 and R^2 may be the same or different;

R^3 is a straight or branched chain alkyl, alkenyl or alkaryl group which is optionally substituted by a halogen atom or a cycloalkyl, hydroxy, alkoxy, nitro, amino, amino-alkyl, acylamino, heteroaryl, heteroaryl-alkyl, aroyl, aryolalkyl or cyano group; and

R^4 represents a hydrogen or halogen atom attached to at least one of the ring carbons of the tetracyclic skeleton, with the proviso that when R_4 is in a position neighboring the nitrogen atom, then R_4 is not halogen;

or a pharmaceutically acceptable salt thereof.

5,589,476

IMIDAZOL-4-YLPIPERIDINE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Samir Jegham, Argenteuil; Gérard Defosse, Paris; Thomas A. Purcell, Montfort L'Amaury, and Luc Even, Paris, all of France, assignors to Synthelabo, Le Plessis Robinson, France

Filed Oct. 3, 1994, Ser. No. 317,661

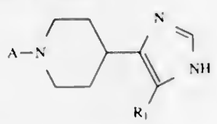
Claims priority, application France, Oct. 4, 1993, 93 11771

Int. Cl.[6] C07D *498/12;498/16;* **A61K** *31/535;31/435*

U.S. Cl. 514—230.2 **3 Claims**

1. A compound of formula (I):

(I)



in which

R_1 represents a hydrogen atom or a straight or branched (C_1-C_4)alkyl group; and

A represents a 4,5-dihydroimidazo[1,5,4-de][1,4]benzoxazin-2-yl group, a 4-methyl-4,5-dihydroimidazo[1,5,4-de][1,4]benzoxazin-2-yl group, a 4-phenyl-4,5-dihydroimidazo[1,5,4-de][1,4]benzoxazin-2-yl group, a 4-phenylmethyl-4,5-dihydroimidazo[1,5,4-de][1,4]benzoxazin-2-yl group, or a 5-methyl-4,5-dihydroimidazo[1,5,4-de][1,4]benzoxazin-2-yl group, which may be unsubstituted or substituted in the 6-position by a phenylmethyl group;

or an addition salt thereof with a pharmaceutically acceptable acid.

5,589,477

PYRIMIDINE DERIVATIVES AND DRUGS

Shoichi Chokai, Kyoto; Tomiyoshi Aoki, Shiga, and Kiyoshi Kimura, Osaka, all of Japan, assignors to Nippon Shinyaku Company, Limited, Japan

Filed Feb. 26, 1993, Ser. No. 983,515

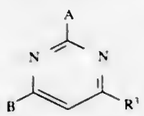
Claims priority, application Japan, Aug. 31, 1990, 2-231029; May 29, 1991, 3-155628

Int. Cl.[6] A61K *31/505;* **C07D** *403/04;403/12*

U.S. Cl. 514—256 **24 Claims**

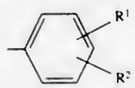
1. A compound of the formula

(I)

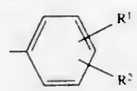


or a pharmacologically acceptable salt thereof wherein A and B are as follows:

When A represents



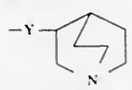
B represents methyl, trifluoromethyl, or tert-butyl; when B represents



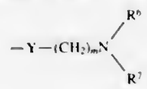
A represents methyl, trifluoromethyl, or tert-butyl wherein

R^1 and R^2 are the same or different and each is hydrogen, hydroxy, lower alkoxy, trifluoromethyl or halogen;

R^3 represents



wherein Y represent O or NH, or



wherein Y represents O or NH, m is 2 or 3, and R^6 and R^7 form a 5 to 6 membered cyclic-amino group with the adjacent nitrogen atom, wherein said cyclic-amino group optionally includes an oxygen or sulfur atom, and said cyclic-amino group being unsubstituted or substituted by aryl with or without substituent(s), aralkyl with or without substituent(s) wherein the alkyl moiety thereof is lower alkyl, or aroyl with or without substituent(s).

5,589,478

BENZENESULFONAMIDE DERIVATIVE AND PROCESS FOR PREPARING THEREOF

Koichiro Yamada; Kōsuke Yasuda, both of Saitama-ken; Kohei Kikkawa, Kawaguchi, and Rikako Kohno, Omiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 16, 1994, Ser. No. 356,958

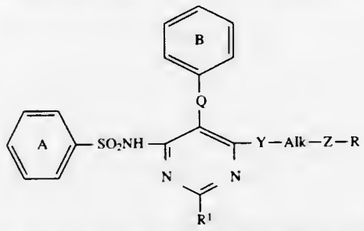
Claims priority, application Japan, Dec. 17, 1993, 5-318779; Jun. 23, 1994, 6-140628; Aug. 4, 1994, 6-183553

Int. Cl.[6] C07D *239/32;239/42;* **A61K** *31/50;31/505*

U.S. Cl. 514—269 **15 Claims**

1. A benzenesulfonamide derivative of the formula [I]:

[I]



wherein Ring A is a benzene ring substituted by a lower alkyl group; one or two lower alkoxy groups; a lower alkoxycarbonyl-lower alkyl group; a hydroxy-substituted lower alkyl group; or a lower alkoxycarbonyl-lower alkoxy group,

Ring B is a benzene ring substituted by formyl group; trifluoromethyl group; a lower alkyl group; one or two lower alkoxy groups; a lower alkylenedioxy group; a hydroxy-lower alkyl group; or a lower alkoxycarbonyl group,

Q is a single bond or a group of the formula: —O— or —S—,

Y is a group of the formula: —O—,

Alk is a lower alkylene group,

Z is a group of the formula: —O—,

R is a phenyl group having optionally a substituent selected from amino group, nitro group, a halogen atom and a hydroxy-lower alkyl group; a pyridyl group having optionally a substituent selected from amino group, nitro group, trifluoromethyl group and a lower alkanoylamino group; a pyrimidinyl group having optionally a substituent selected from a halogen atom, formyl group, thienyl group, furyl group, pyridyl group, a lower alkyl group, a lower alkylthio group, a lower alkanoyl group, a lower alkynyl group, a lower alkenyloxy group, a lower alkoxy group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a cyano-substituted lower alkoxy group, thiazolyl group, a lower alkyl-substituted thienyl group, a lower alkyl-substituted pyrrolyl group, phenyl group and a lower alkoxyphenyl group; or benzothialolyl group, and

R^1 is hydrogen atom, a lower alkyl group, pyridyl group, morpholinyl group or pyrimidiny group or a pharmaceutically acceptable salt thereof.

5,589,479

FUNGICIDAL MIXTURES

Kari Eicken, Wachenheim; Bernd Müller, Frankenthal; Hubert Sauter, Mannheim; Gisela Lorenz, Neustadt; Eberhard Ammermann, Heppenheim; Klaus Schelberger, Gönnheim, and Reinhold Saur, Böhl-Iggelheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 305,396, Sep. 13, 1994, Pat. No. 5,508,283.

This application Oct. 30, 1995, Ser. No. 550,405

Claims priority, application Germany, Sep. 13, 1993, 43 30 970.4

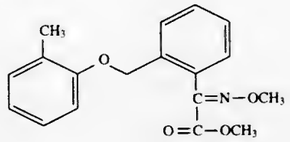
Int. Cl.[6] A01N *37/12;37/18;37/44;43/54*

U.S. Cl. 514—275 **8 Claims**

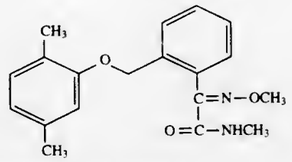
1. A fungicidal mixture containing in synergistic fungicidally effective amounts of:

a) a compound of the formula IA or IB

I.A

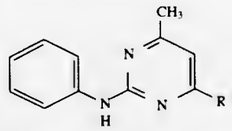


I.B



b) a pyrimidine of the formula II

II



where R is propyn-1-yl,

wherein the weight ratio of the compound IA or IB to the compound II is from 10:1 to 0.1:1.

5,589,480

TOPICAL APPLICATION OF OPIOID ANALGESIC DRUGS SUCH AS MORPHINE

George F. Elkhoury, 1561 Ramillo Ave., Long Beach, Calif. 90815, and Christopb Stein, 310 Warren Ave., #302, Baltimore, Md. 21230

Filed Aug. 17, 1994, Ser. No. 291,614

Int. Cl.[6] A61K *31/485*

U.S. Cl. 514—282 **19 Claims**

1. A method of inducing analgesia in inflamed skin, comprising topically administering to a patient in need of such treatment a topically effective amount of an opioid analgesic agent, which amount is systemically ineffective for induction of analgesia, admixed with a pharmaceutically acceptable excipient for topical administration, whereby effective analgesia is induced in the substantial absence of transdermal delivery of the opioid analgesic agent to the systemic circulation.

5,589,481

NERVE GROWTH FACTOR PRODUCTION ACCELERATORS AND COMPOSITIONS FOR PREVENTING OR TREATING NEURONAL DEGENERATION

Tomoko Tsuji; Kohji Yamaguchi; Kiyosi Kondo, all of Kanagawa, and Teizi Urakami, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, and Sagami Chemical Research Center, both of Toyko, Japan

Continuation of Ser. No. 9,806, Jan. 27, 1993, abandoned.

This application Feb. 22, 1994, Ser. No. 200,912

Claims priority, application Japan, Feb. 7, 1992, 4-056677; Feb. 20, 1992, 4-069382

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—287 **7 Claims**

1. A method for accelerating the production of nerve growth factor in a non-diabetic host in need of such acceleration using a compound which is oxazopyrroloquinoline or an ester thereof represented by the formula:

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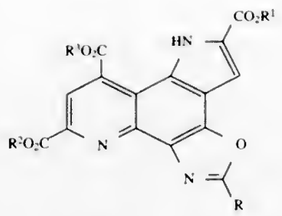


wherein R represents a hydrogen atom or an alkyl group having 1–4 carbon atoms, which may be substituted with a hydroxyl, carboxyl, mercapto, carbamoyl, hydroxyphenyl, guanidyl, imidazolyl, or methylmercapto group, and R^1, R^2 and R^3 represent a hydrogen atom or an alkyl, alkenyl or benzyl group, which may be the same or different, which method comprises administration to such host of an amount of such compound which is effective for such acceleration.

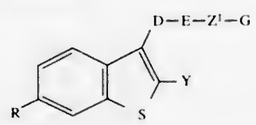
5,589,482

BENZO-THIOPHENE ESTROGEN AGONISTS TO TREAT PROSTATIC HYPERPLASIA

David D. Thompson, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 14, 1994, Ser. No. 356,011
Int. Cl.[6] A61K *31/44;31/445;31/395;31/40*
U.S. Cl. 514—305 **10 Claims**

1. A method of treating prostatic hyperplasia in a mammal which comprises administering to a mammal in need of such treatment a compound of the formula



wherein:

R is OR^1 wherein R^1 is hydrogen, C_1–C_6 alkyl or phenyl optionally substituted with up to three substituents independently selected from C_1–C_6 alkyl, C_1–C_6 alkoxy or halogen;

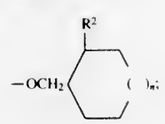
Y is phenyl, optionally substituted with 1 to 3 substituents independently selected from halo, hydroxy and C_1–C_4 alkyl;

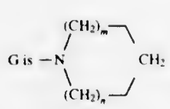
D is —CO— or —CH_2—;

E is 1,4 linked phenylene;

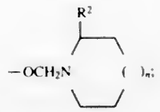
Z^1 is —OCH_2CH_2—, —CH_2CH_2—, —CH_2—, —OCH_2CHR^2—, —C≡C—CH_2—; or

Z^1 in combination with G is





wherein n is 0, 1 or 2; m is 1, 2 or 3; or G is azabicyclohept-2-yl; or G in combination with Z^1 is



and geometric and optical isomers pharmaceutically acceptable esters, ethers and salts thereof.

5,589,483

ISOQUINOLINE POLY (ADP-RIBOSE) POLYMERASE INHIBITORS TO TREAT SKIN DISEASES ASSOCIATED WITH CELLULAR SENESCENCE

Michael D. West, Belmont, Calif., assignor to Geron Corporation, Menlo Park, Calif.

Filed Dec. 21, 1994, Ser. No. 361,798
Int. Cl.[6] A61K *31/47*
U.S. Cl. 514—310 **3 Claims**

1. A method for delaying the onset of cell senescence associated with skin aging in a human comprising administering to fibroblast cells in the human an amount of an isoquinoline PADPRP inhibitor effective to increase the maximum achievable number of cumulative population doublings of the fibroblast cells, whereby the proliferative capacity of the fibroblast cells is increased.

5,589,484

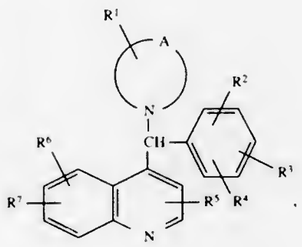
4-QUINOLINYL DERIVATIVES

Marc G. Venet, Le Mesnil Esnard; Jérôme E. G. Guillemont, Oissel; Daniel F. J. Vernier, Rouen, all of France, and Frank C. Odds, Schilde, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

PCT No. PCT/EP93/02884, § 371 Date Apr. 4, 1995, § 102(e) Date Apr. 4, 1995, PCT Pub. No. WO94/10164, PCT Pub. Date May 11, 1994
PCT Filed Oct. 19, 1993, Ser. No. 428,176
Int. Cl.[6] C07D *403/06;* **A61K** *31/47*
U.S. Cl. 514—314 **15 Claims**

1. A compound having the formula

(I)



a pharmaceutically acceptable acid addition salt thereof, a stereochemically isomeric form thereof, a pharmaceutically acceptable quaternized form thereof or an N-oxide thereof, wherein —A— represents a bivalent radical of formula

—N=CH—CH=CH— (a),

—CH=N—CH=CH— (b),

—N=N—CH=CH— (c),

—N=CH—N=CH— (d),

—N=CH—CH=N— (e),

—CH=N—N=CH— (f),

—N=N—N=CH— (g),

—N=N—CH=N— (h),

or

—CH=CH—CH=CH— (i);

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 each independently represent hydrogen, halo, hydroxy, C_{1-4}alkyloxy, C_{1-4}alkyl, trifluoromethyl, amino, mono- or di(C_{1-4}alkyl)amino or nitro, provided that when one substituent on an aromatic ring is a nitro then the other substituents on said aromatic ring are other than nitro.

5,589,485

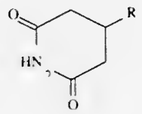
DORRIGOCIN ANTITUMOR AGENTS

Jill E. Hochlowski, Green Oaks; Marianna Jackson, Waukegan, both of Ill.; Sunil K. Kadam, Kenosha, Wis.; James P. Karwowski, Mundelein, and James B. McAlpine, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

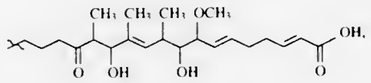
Division of Ser. No. 164,234, Dec. 9, 1993, Pat. No. 5,484,799. This application Apr. 26, 1995, Ser. No. 429,405
Int. Cl.[6] C07D *211/40;211/76;* **A61K** *31/44;31/445*
U.S. Cl. 514—315 **6 Claims**

1. A method of controlling ras-gene dependent tumor development in a patient in need of such treatment, comprising administering to the patient a therapeutically effective amount of a compound having the formula

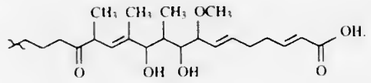
(I)



or a pharmaceutically acceptable salt, ester, amide or pro-drug thereof, wherein R is selected from the group consisting of



and



5,589,486

N-HYDROXYALKYL-SUBSTITUTED 1,2,3,6-TETRAHYDRO-PYRIDINE AND PIPERIDINE DERIVATIVES

Kalman Harsanyi; Tibor Gizur; Eva Agai-Csongor; Anna Kallai-Sohonyai; Marta Kapolnas-Pap; Eva Csizer; Bela Hegedüs; Laszlo Szporny; Bela Kiss; Egon Karpati; Eva Palosi; Zsolt Szombathelyi; Adam Sarkadi; Aniko Gere; Mihaly Bodo; Katalin Csomor; Judit Laszy; Zsolt Szentirmai; Erzsebet Lapis; Sandor Szabo, all of Budapest; Peter Bod, Gyömro, and Attila Csehi, Göd, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

PCT No. PCT/HU92/00050, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO93/11107, PCT Pub. Date Jun. 10, 1993
PCT Filed Dec. 1, 1992, Ser. No. 244,867
Claims priority, application Hungary, Dec. 2, 1991, 3747/91; Jun. 9, 1992, 3747/91
Int. Cl.[6] A61K *31/445;* **C07D** *211/22*
U.S. Cl. 314—317 **8 Claims**

1. A compound selected from the group consisting of:

(a) 1-[4-(4-chlorobenzyl)phenyl]-2-(4-phenyl-1,2,3,6-tetrahydro-1-pyridyl)ethanol;

(b) 1-[4-(4-chlorobenzyl)phenyl]-3-(4-phenyl-1-piperidyl)-propanol;

(c) 1-[4-(4-chlorobenzyl)phenyl]-4-(4-phenyl-1,2,3,6-tetrahydro-1-pyridyl)butanol;

(d) 3-[4-(4-fluorophenyl)-1-piperidyl]-1-(1,1'-biphenyl-4-yl)propanol; and

(e) 3-[4-(4-chlorophenyl)-1,2,3,6-tetrahydro-1-pyridyl]-1-)2,4-dichlorophenyl)propanol; or a pharmaceutically acceptable acid addition salt thereof.

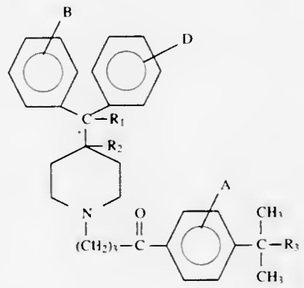
5,589,487

PIPERIDINE DERIVATIVES AND PROCESS FOR THEIR PRODUCTION

Thomas E. D'Ambra, Wynantskill, N.Y., assignor to Albany Molecular Research, Inc., Albany, N.Y.

Division of Ser. No. 83,102, Jun. 24, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 382,425
Int. Cl.[6] A61K *31/445;* **C07D** *211/34*
U.S. Cl. 514—317 **20 Claims**

1. A process of preparing a piperidine derivative compound of the formula:



wherein

R_1 is hydrogen or hydroxy;

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R_2 is hydrogen;

or R_1 and R_2 taken together form a second bond between the carbon atoms bearing R_1 and R_2;

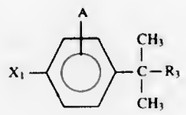
R_3 is —COOH or —$COOR_4$;

R_4 has 1 to 6 carbon atoms;

A, B, and D are the substituents of their aromatic rings, each of which may be different or the same, and are selected from the group consisting of hydrogen, halogens, alkyl, hydroxy or alkoxy,

said process comprising:

acylating a starting compound of the formula:

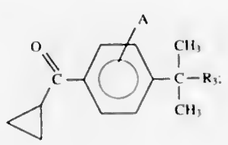


with a compound of the formula:

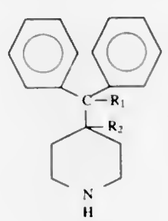
wherein

X_1 is a halogen, trialkyl tin, triflate, or substituents useful in a organometallic coupling reactions

under conditions effective to produce the substantially pure regioisomer of the formula:



and converting the substantially pure regioisomer to the piperidine derivative compound with a piperidine compound of the formula:



5,589,488

N-[(4-HETEROARYL-1-PIPERIDINYL)ALKYL]-2-BENZOXAZOLINONES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

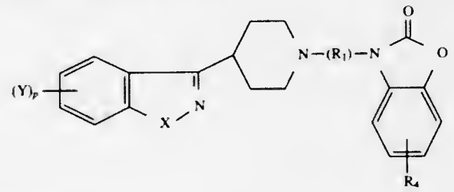
Joseph T. Strupczewski, Flemington, and Edward J. Glamkowski, Warren, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 468,074

Int. Cl.[6] **A61K** *31/445;31/55;31/47;* **C07D** *221/02*

U.S. Cl. 514—321 **16 Claims**

1. A compound of the formula



wherein,

X is —O—, —S—, —NH—, or —$N(R_2)$—;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenysulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—$(CR_{23}R_{24})_n$—$CR_{24}R_{27}$— where n is 0, 1, 2, or 3; or

—CHR_{24}—CH=CH—CHR_{24}—,

—CHR_{24}—C≡C—CHR_{24}—,

—CHR_{24}—CH=CH—$CR_{23}R_{24}$—CHR_{24}—,

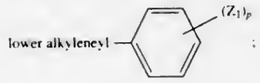
—CHR_{24}—$CR_{23}R_{24}$—CH=CH—CHR_{24}—,

—CHR_{24}—C≡C—$CR_{23}R_{24}$—CHR_{24}—, or

—CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24}—,

the —CH=CH— bond being cis or trans;

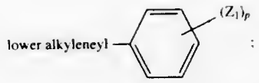
R_{23} is hydrogen, (C_1-C_{18})linear alkyl, phenyl, hydroxy, (C_1-C_{18})alkoxy, aryloxy, aryl(C_1-C_{18})alkyloxy, (C_1-C_{18})alkanoyloxy, hydroxy(C_1-C_6)alkyl, (C_1-C_{18})alkoxy(C_1-C_6)alkyl, phenyl(C_1-C_6)alkoxy, aryl(C_1-C_{18})alkyloxy(C_1-C_6)alkyl, (C_1-C_{18})alkanoyloxy(C_1-C_6)alkyl, or



where

Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined; and

R_{24} is hydrogen, (C_1-C_{18})linear alkyl, phenyl, hydroxy (C_1-C_6)alkyl, (C_1-C_{18})alkoxy(C_1-C_6)alkyl, phenyl(C_1-C_6)alkyloxy, aryl(C_1-C_{18})alkyloxy(C_1-C_6)alkyl, (C_1-C_{18})alkanoyloxy(C_1-C_6)alkyl, or



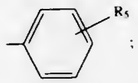
where

Z_1 is as previously defined, and p is as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S; and

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1-C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1-C_{18})acyl amino, (C_1-C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(=O)—$(C_1-C_{18}$ straight or branched chain-)alkyl, or —C(=O)-aryl;

in which aryl is phenyl or



wherein

R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamine, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

all geometric, optical, and stereoisomers thereof; or

a pharmaceutically acceptable acid addition salt thereof.

5,589,489

CYCLIC AMIDE DERIVATIVES FOR TREATING ASTHMA

Ashokkumar B. Shenvi, Wilmington, Del.; Robert T. Jacobs, Macclesfield, England; Scott C. Miller, Wilmington, Del.; Cyrus J. Ohnmacht, Jr., Wilmington, Del., and Chris A. Veale, Newark, Del., assignors to Zeneca Limited, London, United Kingdom

Filed Dec. 12, 1994, Ser. No. 353,767

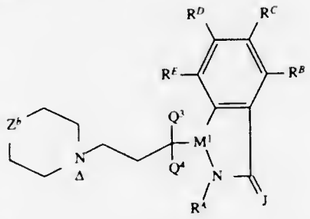
Claims priority, application United Kingdom, Dec. 15, 1993, 9325654; Nov. 17, 1994, 9423248

Int. Cl.[6] **A61K** *31/445;* **C07D** *401/6;401/14*

U.S. Cl. 514—323 **10 Claims**

1. A compound of Formula:

wherein



wherein

Z^b is a disubstituted methylene group $R^{bb}(CH_2)_p$-C—R^{bc} in which R^{bb} is Ar; p is the integer 0 or 1; and R^{bc} is hydrogen, hydroxy, (1–4C)alkoxy, (1–4C)alkanoyloxy, $COOR^{bd}$ (wherein R^{bd} is hydrogen or (1–3C)alkyl), cyano, $NR^{be}R^{bf}$ or SR^{bg} in which R^{be} and R^{bf} are independently hydrogen, (1–4C)alkyl, (1–4C)hydroxyalkyl or (1–4C)alkanoyl; and R^{bg} is hydrogen or (1–4C)alkyl; or R^{bc} forms a double bond with the carbon atom to which it is bonded and with the adjacent carbon atom in the piperidine ring; and wherein

Ar is a phenyl radical or an ortho-fused bicyclic carbocyclic radical of nine or ten ring atoms in which at least one ring is aromatic, which radical Ar may be unsubstituted or may bear one or more substituents selected from halo, cyano, trifluoromethyl, (1–4C)alkyl, (1–4C)alkoxy, methylenedioxy, hydroxy, mercapto, —$S(O)_nR^{Xa}$, (1–3C)alkanoyl, (1–5C)alkanoyloxy, nitro, $NR^{xb}R^{xc}$, $NR^{xd}R^{xe}$, C(=$NR^{xg}R^{xh}$, $CONR^{xb}R^{xc}$ and $COOR^{xj}$ wherein n is the integer 0, 1, or 2; R^{xa} is (1–6C)alkyl, (3–6C)cycloalkyl or phenyl (which phenyl may bear a halo, trifluoromethyl, (1–3C)alkyl or (1–3C)alkoxy substituent); the radical $NR^{xb}R^{xc}$ contains zero to seven carbons and each of R^{xb} and R^{xc} is independently hydrogen, (1–5C)alkyl or (3–6C)cycloalkyl; and wherein R^{xd} is hydrogen or (1–4C)alkyl and R^{xe} is (1–5C)alkanoyl, benzoyl; or a group nf formula C(=J^x)$NR^{xg}R^{xh}$ in which J^x is oxygen, sulfur. NR^{xf} or CHR^{xi}; R^{xf} is hydrogen, (1–5C)alkyl; the radical $NR^{xg}R^{xh}$ contains zero to 7 carbons and each of R^{xg} and R^{xh} is independently hydrogen, (1–5C)alkyl or (3–6C)cycloalkyl and R^{xh} is hydrogen or (1–5C)alkyl; R^{xi} is cyano, nitro, (1–5C)alkylsulfonyl or phenylsulfonyl or phenylsulfonyl; and R^{xj} is hydrogen, (1–5C)alkyl or benzyl;

J is oxygen or sulfur; M^1 is CR^F; R^A is hydrogen or (1–3C)alkyl; the radicals R^B, R^C, R^D and R^E are each hydrogen; or one or more of R^B, R^C, R^D and R^E is a substituent independently selected from halo, trifluoromethyl, hydroxy, (1–3C)alkoxy, (1–3C)alkyl, (1–3C)alkylthio, (1–3C)alkylsulfinyl and (1–3C)alkylsulfonyl, and the others of R^B, R^C, R^D R^E are each hydrogen: or two adjacent radicals of R^B, R^C, R^D and R^E form a methylenedioxy substituent and the others of R^B, R^C, R^D and R^E are hydrogen; R^F is hydrogen, hydroxy, (1–3C)alkoxy or (1–3C)alkyl;

Q^3 is hydrogen or (1–3C)alkyl; and

Q^4 is phenyl which may bear one or two substituents independently selected from halo, trifluoromethyl, hydroxy, (1–3C)alkoxy, (1–3C)alkyl, methylenedioxy (1–3C)alkoxycarbonyl and (1–3C)alkylthio: or Q^4 is thienyl, imidazolyl, benzothiophenyl or naphthyl any of which may bear a halo substituent; or Q^4 is biphenylyl: or Q^4 is carbon-linked indolyl which may bear a benzyl substituent at the 1-position;

or the N-oxide of a piperidino nitrogen indicated by Δ;

or a pharmaceutically acceptable salt thereof;

or a quaternary ammonium salt thereof in which the piperidino nitrogen indicated by Δ is a quadricovalent ammonium nitrogen wherein the fourth radical on the nitrogen R^1 is (1–4C)alkyl or benzyl and the associated counterion A is a pharmaceutically acceptable anion.

5,589,490

BENZOIC ACID SUBSTITUTED DERIVATIVES HAVING CARDIOVASCULAR ACTIVITY

Alberto Sala; Aldo Banfi; Francesca Benedini, and Roberta Cereda, all of Milan, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

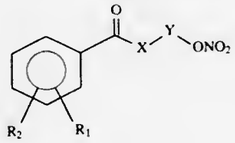
Continuation of Ser. No. 966,078, Jan. 19, 1993, Pat. No. 5,366,992. This application Jun. 6, 1994, Ser. No. 254,779

Claims priority, application Italy, Jul. 26, 1990, 21075 A/90

Int. Cl.[6] **A61K** *31/21;* **C07C** *203/04*

U.S. Cl. 514—330 **11 Claims**

1. A compound of the formula I



(I)

wherein:

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X is the NH group;

Y is an ethylene or a C_3–C_6 straight or branched alkylene, or a cyclopentylene, cyclohexylene or cycloheptylene group;

R_1 is the $OCOR_3$ group, wherein R_3 is methyl, ethyl or C_3–C_5 straight or branched alkyl, or the residue from a 5- or 6-membered monocyclic heterocycle which can be aromatic or partially or totally hydrogenated, containing one or more hetero-atoms selected independently from O, N and S;

R_2 is hydrogen, hydroxy, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, trifluoromethyl, sulfo, nitro, amino, or mono- or di- C_{1-4} alkylamino; or

R_1 and R_2, taken together, are the methylenedioxy group;

with the proviso that when Y is ethylene and R_2 is hydrogen, R_1 cannot be the $OCOR_3$ group at the 2- position in which R_3 is methyl;

and the pharmaceutically acceptable acid salts thereof.

5,589,491

INJECTION AND INJECTION KIT CONTAINING OMEPRAZOLE AND ITS ANALOGS

Shigeo Nakanishi, Neyagawa; Tetsuo Tominaga, Itami; Iwao Yamanaka, Osaka; Takashi Higo, Ikeda, and Toshiyuki Shibata, Nakatsu, all of Japan, assignors to Astra Aktiebolag, Sodertalje, Sweden

PCT No. PCT/JP93/00998, § 371 Date Jan. 18, 1995, § 102(e) Date Jan. 18, 1995, PCT Pub. No. WO94/02141, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 15, 1993, Ser. No. 373,245

Claims priority, application Japan, Jul. 28, 1992, 4-201203

Int. Cl.[6] A61K *31/44;31/415*

U.S. Cl. 514—338 **6 Claims**

1. An injection solution comprising a 2-[(2-pyridyl)methylsulfinyl]benzimidazole compound or a salt thereof having antiulcer activity and an aqueous solvent devoid of non-aqueous solvent, wherein the pH of the injection solution is not less than 9.5 and not more than 11.5.

5,589,492

HETEROCYCLIC COMPOUNDS AND THEIR USE IN THE TREATMENT OF TYPE-II DIABETES

David Haigh, Horsham, England, assignor to SmithKline Beecham PLC, Brentford, England

PCT No. PCT/GB93/00735, § 371 Date Dec. 12, 1994, § 102(e) Date Dec. 12, 1994, PCT Pub. No. WO93/21166, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 7, 1993, Ser. No. 318,615

Claims priority, application United Kingdom, Apr. 10, 1992, 9208016; Apr. 16, 1992, 9208451; Dec. 29, 1992, 9227046

Int. Cl.[6] C07D *413/12;213/74;* **A61K** *31/42;31/44*

U.S. Cl. 514—339 **12 Claims**

1. A compound of formula (I):

$$A^1—X—(CH_2)_n—O—A^2—A^3—CO\,R^2 \qquad (I)$$

or a tautomeric form thereof and/or a pharmaceutically acceptable salt thereof, and/or a pharmaceutically acceptable solvate thereof, wherein:

A^1 represents a substituted or unsubstituted aromatic heterocyclyl group;

A^2 represents a benzene ring having three optional substituents;

A^3 represents a moiety of formula $—(CH_2)_m—CHR^1—$ wherein R^1 represents a halogen atom or a moiety of formula $S(O)_pA^4$ wherein A^4 represents hydrogen, substituted or unsubstituted alkyl, aryl, aralkyl, alkylcarbonyl or an aromatic heterocyclyl group and p represents zero or an integer 1 or 2 and m represents zero or an integer in the range of from 1 to 5, or A^3 represents a moiety of formula $—CH{=}CR^1—$ wherein R^1 is as defined above;

R^2 represents OR^3 wherein R^3 represents hydrogen, alkyl, aryl or aralkyl, or R^2 represents $—NR^4R^5$ wherein R^4 and R^5 each independently represent hydrogen or alkyl or R^4 and R^5 together with the nitrogen atom to which they are attached form a heterocyclic ring;

X represents O, S or NR wherein R represents a hydrogen atom, an alkyl group, an acyl group, an aralkyl group wherein the aryl moiety may be substituted or unsubstituted, or a substituted or unsubstituted aryl group; and

n represents an integer in the range of from 2 to 6.

5,589,493

ANILIDE DERIVATIVES AND THEIR USE FOR COMBATING BOTRYTIS

Karl Eicken, Wachenheim; Norbert Goetz, Worms; Albrecht Harreus, Ludwigshafen; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt, and Harald Rang, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

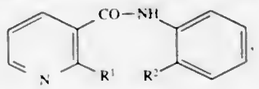
Division of Ser. No. 215,463, Mar. 21, 1994, Pat. No. 5,480,897, which is a division of Ser. No. 973,976, Nov. 9, 1992, Pat. No. 5,330,995. This application Jun. 7, 1995, Ser. No. 478,681

Claims priority, application Germany, Nov. 22, 1991, 41 38 387.7; Feb. 18, 1992, 42 04 764.1; Feb. 18, 1992, 42 04 766.8; Feb. 18, 1992, 42 04 767.6; Feb. 18, 1992, 42 04 768.4

Int. Cl.[6] A01N *43/40;* **C07D** *213/56*

U.S. Cl. 514—355 **16 Claims**

1. A nicotinic anilide derivative of the formula I



I

wherein

R^1 is halogen, methyl, trifluoromethyl, methoxy, methylthio, methylsulfinyl, or methylsulfonyl, and

R^2 is unsubstituted or halogen-substituted C_3–C_{12}-alkyl, unsubstituted or halogen-substituted C_3–C_{12}-alkenyl, C_3–C_6-alkynyl, unsubstituted or halogen-substituted C_2–C_{12}-alkoxy, unsubstituted or halogen-substituted C_3–C_{12}-alkenyloxy, C_3–C_{12}-alkynyloxy, C_3–C_6-cycloalkyl, C_4–C_6-cycloalkenyl, C_5–C_6-cycloalkyloxy, C_5–C_6-cycloalkenyloxy, with the proviso that R^2 is not isopropyl when R^1 is chlorine and that when R^1 is halogen, R^2 is not unsubstituted or halogen-substituted ethoxy.

5,589,494

2-[(3-HETEROARYL-1-PYRROLIDINYL)ALKYL]-1,3-DIOXANES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

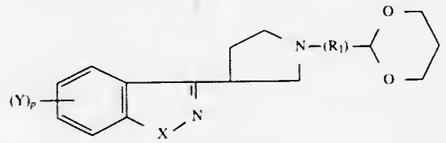
Joseph T. Strupczewski, Flemington; Grover C. Helsley, Stockton; Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station, all of N.J.; Kenneth J. Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, N.J., and John J. Tegeler, Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Summerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,040

Int. Cl.[6] A61K *31/495;31/55;31/505;* **C07D** *401/00*

U.S. Cl. 514—37.3 **14 Claims**

1. A compound of the formula:



wherein,

X is —O—, —S—, —NH—, or $—N(R_2)$;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, $(c_3$–$C_{10})$ cycloalkyl, aroyl, $(C_2$–$C_{18})$ alkanoyl, $(C_1$–$C_{18})$ alkoxycarbonyl and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is $—CR_{24}R_{27}—(CR_{23}R_{27})_n—$, where n is 0, 1, 2 or 4; or

$—CHR_{24}CH{=}CH—CHR_{24}—$,

$—CHR_{24}—C{\equiv}C—CHR_{24}—$,

$—CHR_{24}—CH{=}CH—CR_{23}R_{24}—CHR_{24}—$,

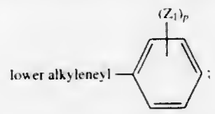
$—CHR_{24}—CR_{23}R_{24}—CH{=}CH—CHR_{24}—$,

$CHR_{24}—C{\equiv}C—CR_{23}R_{24}—CHR_{24}—$, or

$—CHR_{24}—CR_{23}R_{24}—C{\equiv}C—CHR_{24}$.

the —CH=CH— bond being cis or trans;

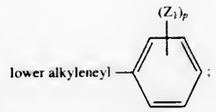
R_{23} is hydrogen, $(C_1$–$C_{18})$ linear alkyl, phenyl, hydroxy, $(C_1$–$C_{18})$ alkoxy, aryloxy, aryl $(C_1$–$C_{18})$ alkyloxy, $(C_1$–$C_{18})$ alkanoyloxy, hydroxy $(C_1$–$C_6)$ alkyl, $(C_1$–$C_{18})$ alkoxy$(C_1$–$C_6)$ alkyl, phenyl $(C_1$–$C_6)$ alkyloxy, aryl $(C_1$–$C_{18})$ alkyloxy $(C_1$–$C_6)$ alkyl, $(C_1$–$C_{18})$ alkanoyloxy $(C_1$–$C_6)$ alkyl or



where

Z_1 is lower alkyl, —OH, lower alkoxy, $—CF_3$, $—NO_2$, $—NH_2$, or halogen, and p is as previously defined;

R_{24} is hydrogen, $(C_1$–$C_{18})$ linear alkyl, phenyl, hydroxy$(C_1$–$C_6)$ alkyl, $(C_1$–$C_{18})$ alkoxy $(C_1$–$C_6)$ alkyl, phenyl $(C_1$–$C_6)$ alkyloxy, aryl $(C_1$–$C_{18})$ alkyoxy $(C_1$–$C_6)$ alkyl $(C_1$–$C_{18})$ alkanoyloxy $(C_1$–$C_6)$alkyl or



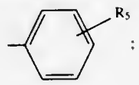
where

Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

alkyl is $(C_1$–$C_{18})$ alkyl;

aryl is phenyl or



where

R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy; and

R_{10} is hydrogen, lower alkyl, C_1–C_3 acyl, aryl, —C(=O)-aryl or —C(=O)-heteroaryl, where aryl and heteroaryl are as defined above; and

m is 1, 2, or 3;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,589,495

2-[(3-HETEROARYL-1-PYRROLIDINYL)ALKYL]-1,3-INDANDIONES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

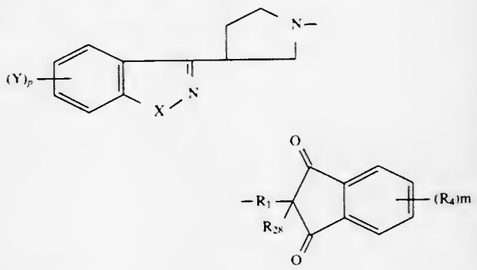
Edward J. Glamkowski, Warren, and Yulin Chiang, Covent Station, both of N.J., assignors to Hoechst Marion Roussel, Inc., Kansas City, Mo.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 471,515

Int. Cl.[6] A61K *31/495;31/55;31/505;31/44;* **C07D** *401/04;403/04;407/04;419/04*

U.S. Cl. 514—373 **14 Claims**

1. A compound of the formula:



wherein

X is —O—, —S—, —NH—, or $—N(R_2)$;

VOL 1193 ISS 5 DEC 31 1996 UMI

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is $—CR_{24}R_{27}—(CR_{23}R_{27})_n—$, where n is 0, 1, 2 or 3; or

$—CHR_{24}CH=CH—CHR_{24}—$,

$—CHR_{24}—C\equiv C—CHR_{24}—$,

$—CHR_{24}—CH=CH—CR_{23}R_{24}—CHR_{24}—$,

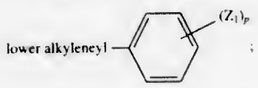
$—CHR_{24}—CR_{23}R_{24}—CH=CH—CHR_{24}—$,

$—CHR_{24}—C\equiv C—CR_{23}R_{24}—CHR_{24}—$, or

$—CHR_{24}—CR_{23}R_{24}—C\equiv C—CHR_{24}$,

the —CH=CH— bond being cis or trans;

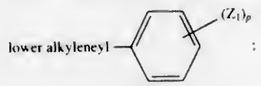
R_{23} is hydrogen, $(C_1–C_{18})$ linear alkyl, phenyl, hydroxy, $(C_1–C_{18})$alkoxy, aryloxy, aryl$(C_1–C_{18})$alkyloxy, $(C_1–C_{18})$alkanoyloxy, hydroxy$(C_1–C_6)$alkyl, $(C_1–C_{18})$alkoxy $(C_1–C_6)$alkyl, phenyl$(C_1–C_6)$alkyloxy, aryl $(C_1–C_{18})$alkyloxy $(C_1–C_6)$alkyl, $(C_1–C_{18})$alkanoyloxy$(C_1–C_6)$alkyl or



;

where Z_1 is lower alkyl, —OH, lower alkoxy, $—CF_3$, $—NO_2$, $—NH_2$, or halogen, and p is as previously defined;

R_{24} is hydrogen, $(C_1–C_{18})$ linear alkyl, phenyl, hydroxy$(C_1–C_6)$alkyl, $(C_1–C_{18})$alkoxy$(C_1–C_6)$alkyl, phenyl$(C_1–C_6)$alkyloxy, aryl$(C_1–C_{18})$alkyoxy$(C_1–C_6)$alkyl, $(C_1–C_{18})$alkanoyloxy$(C_1–C_6)$alkyl or



;

where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

where R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri$(C_1–C_6)$alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, $(C_1–C_{18})$acyl amino, $(C_1–C_{18})$alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(=O)—$(C_1–C_{18}$straight or branched chain-)alkyl or —C(=O)-aryl;

where R_{28} is hydrogen, $(C_1–C_6)$alkyl, aryl$(C_1–C_6)$alkyl, phenyl, or substituted phenyl;

where aryl is phenyl or

;

where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

m is 1, 2, or 3;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a $(C_4—C_{18})$carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a $(C_4—C_{18})$alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

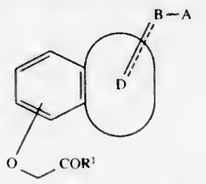
5,589,496

FUSED BENZENEOXYACETIC ACID DERIVATIVES WHICH HAVE PGI_2 RECEPTOR AGONIST ACTIVITY

Nobuyuki Hamanaka; Kanji Takahashi, and Hidekado Tokumoto, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

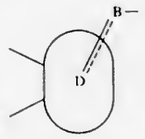
Division of Ser. No. 997,492, Dec. 28, 1992, Pat. No. 5,389,666. This application Nov. 3, 1994, Ser. No. 334,395
Claims priority, application Japan, Dec. 27, 1991, 3-360502; Jul. 14, 1992, 4-209587
Int. Cl.[6] C07D *261/02;* **A61K** *31/42*
U.S. Cl. 514—374 **11 Claims**

1. A fused benzeneoxyacetic acid derivative of the formula (I):



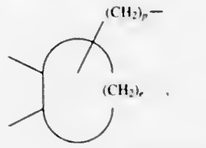
(I)

wherein

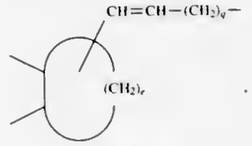


is

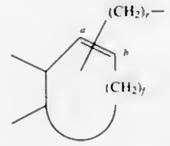
(i)



(ii)

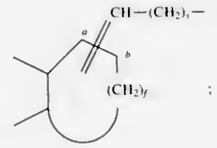


(iii)



or

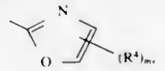
(iv)



;

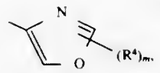
A is

(i)

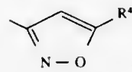


-continued

(ii)



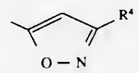
(iii)



,

or

(iv)



R^1 is

(i) a hydroxy group,

(ii) a C_{1-4} alkoxy group, or

(iii) NR^2R^3;

R^2 and R^3 each, independently, is

(i) a hydrogen atom or

(ii) a C_{1-4} alkyl group; or

R^2 and R^3, taken together with a nitrogen atom bond to R^2 and R^3 are the residue of an amino acid;

R^4 each, independently, is

(i) a hydrogen atom,

(ii) a C_{1-4} alkyl group,

(iii) a phenyl group, or

(iv) a C_{1-4} alkyl group substituted by one or two phenyl group; the said phenyl group may also be substituted by one to three of a C_{1-4} alkyl group, a C_{1-4} alkoxy group, a halogen atom, a nitro group or a trihalomethyl group,

Y is an oxygen atom or a sulfur atom;

e is 3–5;

f is 1–3;

l is 1–3;

m is 1 or 2;

p is 1–4;

q is 0–2;

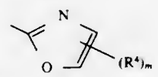
r is 1–4;

s is 0–3;

with the proviso that

(1) when A is

(i)



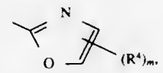
wherein

R^4 is a hydrogen atom,

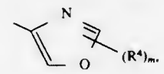
q or s is not zero;

(2) when A is

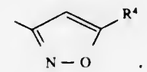
(i)



(ii)



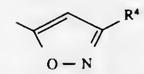
(iii)



.

or

(iv)



wherein Y, l and m are the same meaning as hereinbefore defined, and R^4 is a C_{1-4} alkyl group substituted by a hetero ring, a hetero ring in R^4 should be bonded to the alkyl group via a carbon atom in the hetero ring;

(3) $—(CH_2)_r$ or $=CH—(CH_2)_s—$ should be bonded to the carbon atom at the position a or b in the ring;

or non-toxic salts thereof or non-toxic acid addition salts thereof.

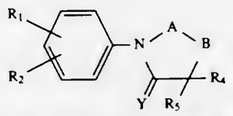
5,589,497

PHENYLIMIDAZOLIDINES

André Claussner, Villemomble; François Goubet, Paris, and Jean-Georges Teutsch, Pantin, all of France, assignors to Roussel Uclaf, Romainville, France

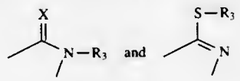
Division of Ser. No. 68,736, May 28, 1993, Pat. No. 5,434,176. This application Apr. 8, 1994, Ser. No. 225,230
Claims priority, application France, Jul. 8, 1992, 92 08432
Int. Cl.[6] C07D *233/74*
U.S. Cl. 514—386 **17 Claims**

1. A compound selected from the group consisting of compounds of the formula



I

wherein one of R_1 and R_2 is —CN, and the other is $—CF_3$, -A-B- is selected from the group consisting of



wherein X is —O— or —S—, R_3 is alkyl of up to 12 carbon atoms optionally substituted with —OH, Y is —O—, —S—, or NH; R_4 and R_5 are individually selected from the group consisting of hydrogen and alkyl of up to 12 carbon atoms optionally substituted with at least one halogen and their non-toxic pharmaceutically acceptable acid addition salts.

5,589,498

TRANSDERMAL DELIVERY OF THE ACTIVE ENANTIOMER OF KETOROLAC

Judy M. Mohr, Menlo Park; Richard W. Baker, Palo Alto, and Lisa A. Nakaji, San Jose, all of Calif., assignors to Pharmetrix Corporation, Menlo Park, Calif.

Continuation of Ser. No. 8,814, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 973,801, Nov. 9, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,648
Int. Cl.[6] A61K *31/40;9/70*
U.S. Cl. 514—413 **19 Claims**

1. A patch for the transdermal administration of ketorolac and through a patient's skin for a period of 12 hours or more, said patch comprising:

(a) an occlusive backing layer having a skin-facing side, and

(b) a drug depot having a skin-facing side and a skin-distal side in contact with said skin-facing side of said backing layer, said depot comprising,

i. (–) ketorolac,

ii. an enhancer combination comprising a plasticizing-type enhancer and a solvent-type enhancer, said plasticizing-type enhancer being a member selected from the group consisting of isopropyl myristate, caprylic triglyceride, capric triglyceride and glyceryl oleate, and said solvent-type enhancer being a member selected from the group consisting of propylene glycol, glycerin and butanol, and

iii. an adhesive polymer in which said (–) ketorolac and said enhancer are dispersed,

wherein said patch delivers (–) ketorolac through the skin facing side of said patch and through said patient's skin at a flux rate of about 20 $g/cm^2.hr$ or more.

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5,589,499

DOPAMINERGIC AGENTS FOR THE TREATMENT OF CEREBRAL AND PERIPHERAL BLOOD FLOW DISORDERS

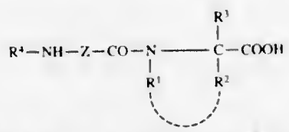
Gosbert Weth, Coburgerstrasse 6, W-8520, Erlangen, Germany

Continuation of Ser. No. 981,368, Nov. 25, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 339,423

Int. Cl.[6] A61K *31/40*

U.S. Cl. 514—423 **4 Claims**

1. A method for increasing the rate of cerebral or peripheral blood flow in a patient who already suffers from cerebral or peripheral blood flow disorders which comprises administering to such a patient an amount of a compound effective to increase the flow of blood in said patient and to cause a significant increase of dopamine in said patient, wherein said compound is of the Formula (I):



(I)

wherein R^1 and R^2 (as shown by the broken line) together are a pyrrolidine ring;

R^3 is hydrogen;

R^4 is hydrogen, alkyl or

where R^5 is hydrogen or lower alkyl and R^6 is 2-phenylethyl or n-propyl, and Z is a straight-chain or branched-chain alkylene having from 1 to 3 carbon atoms, or a pharmaceutically acceptable salt thereof, wherein the compound is administered to the patient at a dosage of 2 to 20 mg per day.

5,589,500

SUBSTITUTED 1,1,2-TRIPHENYLBUTENES AND THEIR USE IN THE TREATMENT OF CANCER

Karen J. Edwards, Natal, South Africa; Michael Jarman, Tooting, England; Charles A. Laughton, Sutton, England; Stephen Neidle, Oxhey, England, and Ian R. Hardcastle, Sutton, England, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB93/00889, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO93/22275, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 29, 1993, Ser. No. 331,582

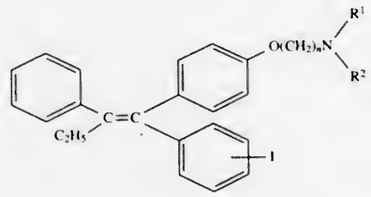
Claims priority, application United Kingdom, May 1, 1992, 9209509; Feb. 26, 1993, 9303982

Int. Cl.[6] C07C *217/18;* **C07D** *295/088;* **A61K** *31/135;31/40*

U.S. Cl. 514—428 **13 Claims**

1. Compounds of the general formula

(2)



wherein n is an integer of from 3 to 8, the iodo substituent is in the 3- or 4-position and R^1 and R^2, which may be the same or different, represent C_{1-3} alkyl groups or R^1 represents a hydrogen atom and R^2 a C_{1-3} alkyl group or R^1 and R^2 together with the nitrogen atom to which they are attached represent a saturated heterocyclic group, in the form of their free bases or pharmaceutically acceptable acid addition salts.

5,589,501

PHARMACEUTICAL COMPOUNDS

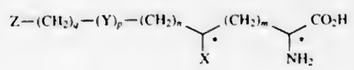
Jesus E. Carrera; Almudena R. Esteban, both of Madrid, Spain; André Mann, Ostwald; Angèle Schoenfelder, Lampertheim, both of France; Darryle D. Schoepp, Indianapolis, Ind.; Concepcion P. Tercero, Madrid, Spain, and Camille-Georges Wermuth, Strasbourg, France, assignors to Eli Lilly and Company, Indianapolis, Ind.; Universite Louis Pasteur, Strasbourg Cedex, France, and Lilly, S.A., Madrid, Spain

Filed Nov. 22, 1994, Ser. No. 343,817

Int. Cl.[6] C07C *229/36;* **C07D** *257/04;* **A61K** *31/195;31/41*

U.S. Cl. 514—438 **7 Claims**

1. A compound of the formula



in which m is 1 or 2, n and q are each 0 or 1 to 5, and p is 0 or 1,

X is $—CO_2H$ or tetrazolyl,

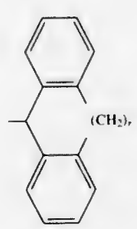
Y is —CH=CH—, and

Z is

(i) phenyl, naphthyl or thienyl, said phenyl, naphthyl and thienyl being optionally substituted,

(ii) $—CHR^1R^2$ where R^1 and R^2 are each phenyl, naphthyl or thienyl, said phenyl, naphthyl and thienyl being optionally substituted, or

(iii)



where r is 0 or 1 to 3 and the phenyl rings are optionally substituted;

provided that when Z is phenyl and m is 1, p is 1; or a salt or ester thereof.

5,589,502

BACCATIN DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Kenji Tsujihara, Urawa; Tomiki Hashiyama, Washimiya-machi; Motoaki Ohashi, Koganei, and Noriyuki Nakanishi, Kawaguchi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

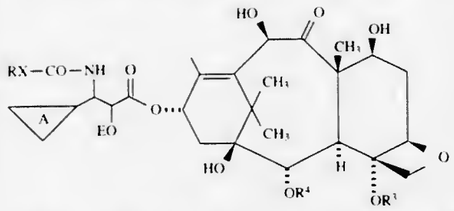
Filed Nov. 15, 1995, Ser. No. 558,772

Claims priority, application Japan, Nov. 17, 1994, 6-283780; Sep. 28, 1995, 7-251185

Int. Cl.[6] C07D *305/14;* **A61K** *31/335*

U.S. Cl. 514—449 **12 Claims**

1. A compound represented by the formula [I]:



[I]

wherein R^3 represents a lower alkanoyl group; R^4 represents a substituted or unsubstituted benzoyl group; ring A represents a substituted or unsubstituted cyclopropane ring; X represents a single bond or a group represented by —O—, —S— or —NH—; R represents a substituted or unsubstituted lower alkyl group (wherein said lower alkyl group may have a cycloalkyl moiety), a substituted or unsubstituted aryl group or a substituted or unsubstituted aromatic heterocyclic group; E represents a hydrogen atom or a group represented by $—CO(CH_2)_nZY$; Y represents a residue obtained from an amino acid or a dipeptide by removing a hydroxyl group in one carboxyl group (wherein an amino group existing in said residue may be protected, and a carboxyl group existing in said residue may be esterified or amidated); Z represents a group represented by the formula of —O— or —NH—; and n represents 1, 2, 3, 4, 5 or 6, or a pharmaceutically acceptable salt thereof.

5,589,503

ENDOPARASITICIDAL COMPOSITIONS

Norbert Mencke, Leverkusen; Achim Harder, Köln, and Peter Jeschke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 4, 1995, Ser. No. 368,515

Claims priority, application Germany, Jan. 11, 1994, 44 00 464.8

Int. Cl.[6] A61K *31/335*

U.S. Cl. 514—450 **5 Claims**

1. A composition comprising approximately equal amounts by weight of a compound selected from the group consisting of praziquantel and epsiprantel; and one compound is selected from the group consisting of cyclo(-MeLeu-D-Lac-MeLeu-D-PhLac-MeLeu-D-Lac-MeLeu-D-PhLac-) and cyclo(-MeLeu-D-Lac-MeLeu-D-p-MorPhLac-MeLeu-D-Lac-MeLeu-D-p-MorPhLac-).

5,589,504

TREATMENT OF NEWBORN JAUNDICE

Andrew J. Dannenberg, New York, and Jayanta R. Chowdhury, New Rochelle, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, and Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University, Bronx, both of N.Y.

Filed Jul. 26, 1994, Ser. No. 279,899

Int. Cl.[6] A61K *31/36;31/195;31/185;31/095*

U.S. Cl. 514—456 **6 Claims**

1. A method of prophylaxis or treatment of newborn jaundice comprising administering to a subject in need of said prophylaxis or treatment a therapeutically effective amount of a compound which is not habit-forming and which does not cause drowsiness and which does not contain heavy metals or arsenic and which at a concentration of less than 50 μM doubles the quinone reductase specific activity of Hepa 1clc7 cells, said compound being selected from the group consisting of Michael reaction acceptors; diphenols, quinones and compounds which are metabolized to these in Hepa 1clc7 cells; isothiocyanates; fumarates; maleates; 1,2-dithiole-3-thione; beta-naphthoflavone; methyl propiolate; and crotonaldehyde.

5,589,505

METHOD OF TREATING WRINKLES USING QUINIC ACID OR QUINOLACTONE

Ruey J. Yu, Ambler, and Eugene J. Van Scott, Abington, both of Pa., assignors to Tristrata Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 5, 1995, Ser. No. 463,724

Int. Cl.[6] A61K *7/48;31/19;31/365*

U.S. Cl. 514—470 **10 Claims**

1. Method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising quinic acid or a topically effective salt thereof, or quinolactone in an amount and for a period of time sufficient to visibly reduce said wrinkle, wherein said wrinkle is a facial wrinkle.

5,589,506

STILBENE DERIVATIVE AND STILBENE ANALOG DERIVATIVE, AND USE THEREOF

Koichi Hashimoto, Yokohama; Akio Yamada, Chigasaki; Hirokazu Hamano, Isehara; Shigehiro Mori, Zama, and Hisako Moriuchi, Yokohama, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00390, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO94/20456, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 10, 1994, Ser. No. 331,618

Claims priority, application Japan, Mar. 10, 1993, 5-074992; Jun. 28, 1993, 5-182027; Aug. 5, 1993, 5-212097; Aug. 19, 1993, 5-225030

Int. Cl.[6] A61K *31/275;* **C07C** *255/34*

U.S. Cl. 514—520 **15 Claims**

1. A compound of the formula:

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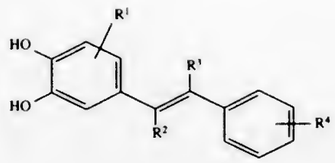


wherein

R^1 is hydrogen or hydroxy;

R^2 and R^3 are different and each is hydrogen or cyano; and

R^4 is lower alkyl, lower alkoxy, halogen or trifluoromethyl.

5,589,507

METHOD FOR STERILIZING MEDICAL DEVICES UTILIZING A ROOM TEMPERATURE STERILANT

Robert T. Hall, II, Welch, and Bradley K. Onstad, Deephaven, both of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Filed Nov. 17, 1995, Ser. No. 558,236

Int. Cl.[6] A01N *37/00;37/02;59/00;* **A61K** *33/40*

U.S. Cl. 514—557 **28 Claims**

1. A method of sterilizing a medical device comprising contacting a surface to be sterilized of the medical device with an anti-microbial composition having improved anti-corrosive properties, wherein the anti-microbial composition is made by combining sufficient amount of an ester of formic acid, an oxidizer and water to provide about 0.01 to about 10 wt. % of the ester of formic acid, from about 0.01 to about 10 wt. % of the oxidizer, from about 0.001 to about 5 wt. % of performic acid, and up to about 99.98 wt. % of water.

5,589,508

USE OF AN EMULSION TO PREPARE AN INTRAVENSOUSLY ADMINISTERED MEDICAMENT FOR TREATING SKIN DISEASES

Ewald Schlotzer, Oberursel; Peter Mayser, Biebertal; Friedrich Grimminger, Butzbach; Werner Seeger, Lahnau; Burghard Weidler; Klaus Sommermeyer, both of Rosbach, and Martin Thomas, Frankfurt am Main, all of Germany, assignors to Fresenius AG, Germany

PCT No. PCT/EP92/02285, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/06812, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 211,644

Claims priority, application Germany, Oct. 11, 1991, 41 33 694.1

Int. Cl.[6] A61K *31/20*

U.S. Cl. 514—560 **13 Claims**

1. A method for treating a skin disease in a patient, comprising administering intravenously to a patient suffering from a skin disease an effective amount of an emulsion comprising at least one polyunsaturated long-chain omega-3 or omega-6 fatty acid, or a pharmaceutically acceptable ester or salt thereof, and a conventional additive.

5,589,509

METHODS OF REDUCING PORPHYRIN TOXICITY USING FATTY ACIDS

David F. Horrobin, Guildford, England, assignor to Efamol Limited, England

Continuation of Ser. No. 372,846, Jan. 13, 1995, abandoned, which is a continuation of Ser. No. 136,606, Oct. 15, 1993, abandoned, which is a continuation of Ser. No. 847,884, Mar. 10, 1992, abandoned, which is a continuation of Ser. No. 611,881, Nov. 13, 1990, abandoned, which is a division of Ser. No. 480,375, Feb. 14, 1990, Pat. No. 4,996,233. This application Mar. 6, 1996, Ser. No. 611,525

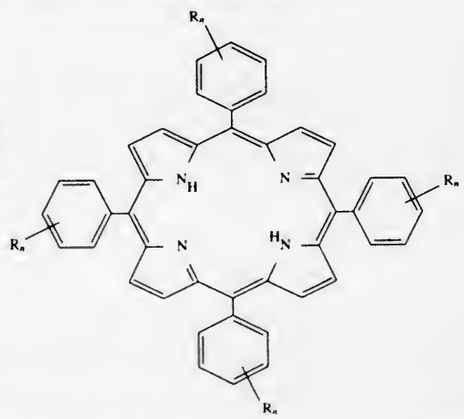
Claims priority, application United Kingdom, Sep. 13, 1985, 85/22670

Int. Cl.[6] A61K *31/20;31/40*

U.S. Cl. 514—560 **4 Claims**

1. In a method of enhancing the effect of administered tumor cell-locating porphyrins in subsequent light irradiation to destroy tumor cells,

the improvement wherein, in conjunction with treatment of a patient having a tumor susceptible to porphyrin therapy with said porphyrin, there is administered an effect-enhancing amount of an essential fatty acid of the n-6 series or the n-3 series alone or in an acceptable pharmaceutical diluent or carrier, and wherein said porphyrin is HpD or a water-soluble, tumor-locating meso-porphyrin of the formula:



wherein R is hydroxy, amino or sulphydryl and n is 1 to 3, alone or in a pharmaceutically acceptable diluent or carrier.

5,589,510

METHOD FOR INHIBITING RETROVIRAL INFECTION BY ADMINISTERING A NAPHTHALENESULFONIC ACID COMPOUND

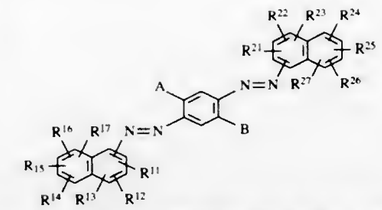
Mitsunori Ono; Yumiko Wada, both of Lexington; Yaming Wu, Cambridge, all of Mass.; Hiroshi Kitaguchi, Kanagawa, Japan; Yumiko Jimbo, Asaka, Japan; Ryoichi Nemori, Kanagawa, Japan; Stephen Gillies, Hingham, and Kin-Ming Lo, Wellsley, both of Mass., assignors to Fuji Immunopharmaceuticals Corp., Lexington, Mass.

Continuation-in-part of Ser. No. 253,156, Jun. 2, 1994, abandoned. This application May 15, 1995, Ser. No. 441,219

Int. Cl.[6] A61K *31/175;31/16;31/10*

U.S. Cl. 514—590 **14 Claims**

1. A method for treating retroviral infection in a subject comprising administering to said subject a therapeutically effective amount of a naphthalenesulfonic acid compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein R^{11} to R^{27} are individually selected from the group consisting of a hydrogen atom, a hydroxyl group, an amino group which is optionally substituted with an alkyl group or an aryl group, a sulfo group, a carboxyl group, an amide group which is optionally substituted with an alkyl group or an aryl group, an acylamino group, a sulfonamide group, a sulfonylamino group, an alkoxy group and a halogen atom;

provided that at least one of R^{11} to R^{17} is a hydroxyl group or an amino group, at least one of R^{21} to R^{27} is a hydroxyl group or an amino group, at least one of R^{11} to R^{17} is a sulfo group, and at least one of R^{21} to R^{27} is a sulfo group;

A and B are individually selected from the group consisting of a hydrogen atom, an alkyl (C_1–C_4) group, an alkoxy (C_1–C_4) group, and a halogen atom.

5,589,511

METHOD FOR TREATING MIGRAINE HEADACHES USING OPTICALLY PURE S(+) FLUOXETINE

James W. Young, Palo Alto, Calif., and Timothy J. Barberich, Concord, Mass., assignors to Sepracor Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 67,380, May 26, 1993, abandoned, and Ser. No. 793,036, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 566,655, Aug. 13, 1990, Pat. No. 5,104,899, said Ser. No. 67,380is a division of Ser. No. 793,036. This application Apr. 15, 1994, Ser. No. 228,240

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—646 **10 Claims**

1. A method of treating migraine headaches in a human, comprising administering to said human a therapeutically effective amount of S(+) fluoxetine or a pharmaceutically acceptable salt thereof, substantially free of its R(−) stereoisomer.

5,589,512

METHOD FOR TREATING BORDERLINE PERSONALITY DISORDER WITH SEROTONIN RE-UPTAKE BLOCKERS

Michael J. Norden, 348 NW. 113th Pl., Seattle, Wash. 98177

Continuation of Ser. No. 870,360, Apr. 17, 1992, Pat. No. 5,283,263, which is a division of Ser. No. 610,339, Nov. 5, 1990, Pat. No. 5,114,976, which is a continuation of Ser. No. 294,461, Jan. 6, 1989, abandoned. This application Jan. 25, 1994, Ser. No. 186,232

Int. Cl.[6] A61K *31/135;31/435;31/15;31/445*

U.S. Cl. 514—651 **4 Claims**

1. A method for treating borderline personality disorder in a patient in need thereof comprising administering to said patient a nontoxic dose of a serotonin re-uptake blocker.

5,589,513

PHARMACEUTICAL COMPOSITION AND PROCESS FOR THE PREPARATION THEREOF

Kálmán Magyar; József Gaál; István Sziráki; József Lengyel; Anna Z. Szabó, all of Budapest; Katalin Mármarosi, Biatorbágy; István Hermecz, Budapest; István Szatmári, Budapest; Zoltán Török, Budapest, and Péter Körmöczy, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU92/00060, § 371 Date Jun. 17, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO93/12775, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 18, 1992, Ser. No. 256,128

Claims priority, application Hungary, Dec. 20, 1991, 4060/91

Int. Cl.[6] A01N *33/02;* **A61K** *31/135*

U.S. Cl. 514—654 **3 Claims**

1. A pharmaceutical composition for treating a neurodegenerative disease by selectively inhibiting MAO-B activity without inhibiting MAO-A activity and by inhibiting uptake of a biogenic amine to the brain, which consists essentially of:

(a) a fast-acting MAO-B inhibitor in an amount effective to inhibit MAO-B selected from the group consisting of deprenyl and p-fluoro-deprenyl or a pharmaceutically acceptable acid addition salt thereof; and

(b) a slow-acting inhibitor of uptake of a biogenic amine in an amount effective to inhibit uptake of a biogenic amine, said slow-acting inhibitor of uptake of a biogenic amine selected from the group consisting of deprenyl and p-fluoro-deprenyl or a pharmaceutically acceptable acid addition salt thereof.

5,589,514

ARYLCYCLOALKYL DERIVATIVES, THEIR PRODUCTION AND THEIR USE

Ramachandra G. Naik; Vilas N. Mumbaikar; Rangarajan Vasumathy; Aftab D. Lakdawala, all of Bombay; Mandakini V. Shirole, Thane; Bansi Lal, Bombay, all of Ind.; Jürgen Blumbach, Niedernhausen, Germany; Klaus U. Weithmann, Hofheim am Taunus, and Robert R. Bartlett, Darmstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

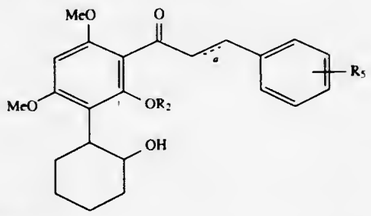
Continuation of Ser. No. 2,863, Jan. 14, 1993, abandoned. This application May 19, 1995, Ser. No. 444,518

Claims priority, application European Pat. Off., Jan. 16, 1992, 92100664

Int. Cl.[6] A61K *31/165;* **C07C** *59/84*

U.S. Cl. 514—681 **4 Claims**

1. Compounds of the formula III



(III)

wherein

R_2 is H or C_1–C_3-alkyl.

R_5 denotes one or two halogens, one or two C_1–C_6-alkyl groups, one or two C_1–C_3-alkoxy groups, hydroxy, CF_3 or —OCH_2—O—,

and a denotes an optional additional single bond.

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5,589,515

COSMETIC COMPOSITION AND AN EMULSION COMPOSITION

Masao Suzuki, Nara-ken; Koichi Saito, Amagasaki, and Masahide Nakata, Nishinomiya, all of Japan, assignors to NOF Corporation, Japan

PCT No. PCT/JP92/01229, § 371 Date May 27, 1993, § 102(e) Date May 27, 1993, PCT Pub. No. WO93/05755, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 25, 1992, Ser. No. 66,017

Claims priority, application Japan, Sep. 27, 1991, 3-276697; Dec. 11, 1991, 3-351403

Int. Cl.[6] A61K *7/00;31/185*

U.S. Cl. 514—784 **20 Claims**

1. A composition as a cosmetic which comprises 0.1 to 99 weight % of a first component and 99.9 to 1 weight % of a second component which is water soluble the first component comprising 85 or more weight % of a cisΔ9-octadecenoic acid or derivatives thereof included within 90 weight % or more of a cis-Δ9-alkenoic acid or derivatives thereof, wherein the first component is either insoluble in the second component, dissolved in the second component or emulsified in the second component.

5,589,516

LIQUID PREPARATION OF ANTITHROMBIN-III AND STABILIZING METHOD THEREFOR

Katsuhiro Uriyu; Akimasa Ohmizu; Hajime Fukuyama; Kazuo Takechi, and Kazumasa Yokoyama, all of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka, Japan

PCT No. PCT/JP94/00563, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO94/22471, PCT Pub. Date Oct. 13, 1994

PCT Filed Apr. 5, 1994, Ser. No. 351,268

Claims priority, application Japan, Apr. 5, 1993, 5-100117; Dec. 24, 1993, 5-328205; Jan. 21, 1994, 6-005073

Int. Cl.[6] A61K *35/16;37/18;37/64;39/395*

U.S. Cl. 514—2 **32 Claims**

1. A liquid pharmaceutical preparation of antithrombin-III, comprising an antithrombin-III dissolved in water, an organic acid which is a dibasic acid and/or a tribasic acid or a salt thereof, and a non-ionic surfactant.

5,589,517

MODIFIED ION EXCHANGE RESINS AND USE THEREOF

Takahiro Sugawara; Michi Watanabe; Naoko Sumitani; Miwa Shirasaki, and Toshitaka Suzuki, all of Ami-machi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo-to, Japan

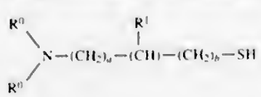
Filed Apr. 6, 1995, Ser. No. 417,763

Claims priority, application Japan, Apr. 8, 1994, 6-070771; Aug. 11, 1994, 6-189405; Aug. 19, 1994, 6-195627; Sep. 5, 1994, 6-211510; Nov. 9, 1994, 6-275104; Nov. 9, 1994, 6-275105

Int. Cl.[6] C07C *39/12;39/06;39/16*

U.S. Cl. 521—33 **8 Claims**

1. In a process for preparing a bisphenol by the catalytic condensation reaction of a phenol with a ketone, the improvement which comprises the use of a catalyst which is a modified ion exchange resin comprising a strongly acidic ion exchange resin of a sulfonic acid type having an N,N-di-substituted mercaptoalkylamine ionically bound thereto, the N,N-di-substituted mercaptoalkylamine being represented by the formula (0):



$$R^0_2N-(CH_2)_a-(CH)-(CH_2)_b-SH \quad (0)$$

wherein R^1 represents hydrogen or an alkyl group having 1–6 carbon atoms, and R^0s independently represent an alkyl group having 1–10 carbon atoms or the substituents R^0 are bonded to each other at their ω-terminals to form an alkylene ring having 4–5 carbon atoms together with the nitrogen atom, a and b independently denote an integer from 0 to 3, and a+b equals 2 or 3.

5,589,518

BIODEGRADABLE FOAMED ARTICLES AND PROCESS FOR THE PREPARATION THEREOF

Catia Bastioli, Novara; Vittorio Bellotti, Fontaneto d'Agogna; Gianfranco Del Tredici, Sesto Calende, and Angelos Rallis, Novara, all of Italy, assignors to Novamont S.p.A., Italy

Continuation-in-part of Ser. No. 384,515, Feb. 6, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 469,566

Claims priority, application Italy, Feb. 9, 1994, MI94A0228

Int. Cl.[6] C08J *9/24;9/36*

U.S. Cl. 521—55 **25 Claims**

1. Process for preparing biodegradable foamed articles from foamed particles having a density from 0.003 to 0.1 g/cm^3 and said particles being of a composition comprising:

30 to 98.5% by weight of thermoplastic starch or a natural thermoplastic polymeric substance, which when converted into the thermoplastic state, is capable of absorbing an amount of water equal to at least 15% of its weight;

0.5 to 70% by weight of a thermoplastic polymer, and

0 to 20% of water based on the weight of the composition;

said process comprising the step of agglomerating the particles, or the particles and a coating agent capable of promoting the bonding between the particles when subjected to compression, by compression under heat conditions until reduction of the volume of the particles is from 20 to 500%.

5,589,519

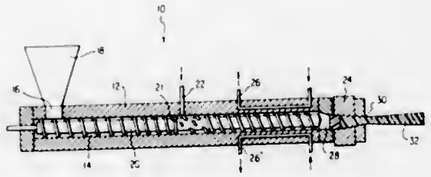
PROCESS OF EXTRUDING LIGHTLY CROSSLINKED POLYOLEFIN FOAM

Dennis A. Knaus, 12 Marlin Dr., Malbern, Pa. 19355

Filed Sep. 30, 1994, Ser. No. 315,445

Int. Cl.[6] C08J *9/18*

U.S. Cl. 521—60 **111 Claims**



1. A method for the preparation of a lightly crosslinked polyolefin foam, comprising the steps of:

a) providing a composition comprising at least one polyolefin;

b) inducing light crosslinking in said composition;

c) melting said lightly crosslinked composition into a molten mass;

d) mixing said molten mass with a blowing agent at a first pressure to form an admixture;

e) cooling said admixture to an appropriate foaming temperature; and

f) extruding said cooled admixture at a second pressure into a lightly crosslinked polyolefin foam.

5,589,520

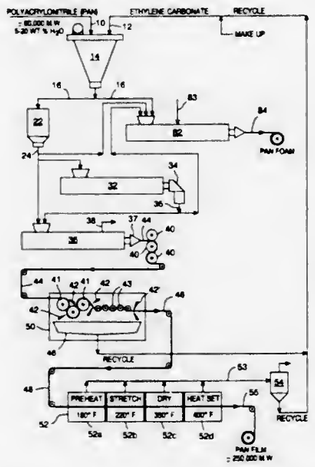
ACRYLONITRILE POLYMER COMPOSITION AND ARTICLES AND METHODS FOR THEIR PREPARATION

Edmund H. Merz, Melbourne Beach, Fla.; Roy A. White, Somers, Conn.; John P. Fouser, San Francisco, and Norman Fishman, Menlo Park, both of Calif., assignors to Solcas Polymer, Limited Partnership, Walpole, Mass.

Continuation of Ser. No. 191,171, Feb. 3, 1994, abandoned, which is a division of Ser. No. 822,288, Jan. 21, 1992, Pat. No. 5,304,590. This application Feb. 3, 1995, Ser. No. 384,448

Int. Cl.[6] C08J *9/12*

U.S. Cl. 521—64 **6 Claims**



1. A method of making a polymeric foam comprising polyacrylonitrile comprising:

(a) forming a free-flowing particulate polymer comprising polyacrylonitrile and having from about 5 percent to about 20 percent by weight of an absorption aid therein;

(b) mixing a liquid fugitive plasticizer with the particulate polymer to produce a free-flowing particulate polymer wherein the plasticizer is uniformly absorbed in the particulate polymer; and

(c) extruding the particulate polymer at sufficient temperature and with sufficient blowing agent to form a foamed polymer.

5,589,521

Patent Not Issued For This Number

5,589,522

INK COMPOSITION

Bradley L. Beach, Lexington, Ky.; James F. Feeman, Wyomissing, Pa.; Anna M. Pearson, Richmond, and Jing X. Sun, Lexington, both of Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Dec. 21, 1994, Ser. No. 360,200

Int. Cl.[6] C03C *17/00*

U.S. Cl. 523—160 **13 Claims**

1. An aqueous ink composition for ink jet printers comprising an aqueous carrier, a pigment, and a polymer component selected from a graft polymer comprising:

(a) a hydrophilic polyacrylic acid backbone of weight average molecular weight between 1000 and 5000; and

(b) hydrophobic segment side chains, in amount of one to ten side chains attached to one backbone chain.

5,589,523

MICROCAPSULE-TYPE CURING AGENT, METHOD FOR PRODUCING THE SAME, THERMOSETTING RESIN COMPOSITION, PREPREG AND FIBER REINFORCED COMPOSITE MATERIAL

Ryuji Sawaoka, Ehime; Shinji Kouchi, and Toshio Muraki, both of Matsuyama, all of Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 401,195, Mar. 9, 1995. This application Jun. 6, 1995, Ser. No. 468,445

Claims priority, application Japan, Mar. 15, 1994, 6-043679

Int. Cl.[6] C08K *9/10*

U.S. Cl. 523—211 **7 Claims**

1. A method for producing a microcapsule curing agent comprising the steps of:

dissolving i) a water-insoluble curing agent for a thermosetting resin and ii) a water-insoluble thermoplastic resin in an organic solvent and forming an organic solution;

forming an emulsion solution by initially adding water to the organic solution and, thereafter, further adding water to the organic solution and transforming the organic solution into an emulsion solution in which an organic solvent phase is dispersed in said water; and removing said organic solvent from the emulsified solution.

5,589,524

POLYPHENYLENE SULFIDE RESIN COMPOSITION AND LIGHT REFLECTIVE MOLDED ARTICLE

Yasuhisa Ogita, and Toshikazu Kato, both of Mie, Japan, assignors to Tosoh, Corporation, Yamaguchi, Japan

Filed Jul. 25, 1995, Ser. No. 507,015

Claims priority, application Japan, Jul. 27, 1994, 6-175185

Int. Cl.[6] C08K *9/06*

U.S. Cl. 523—212 **9 Claims**

1. A polyphenylene sulfide resin composition consisting of from 40 to 60% by weight of a polyphenylene sulfide resin having a melt viscosity of from 300 to 4,000 poises determined at a temperature of 300° C. under a load of 10 kg, from 30 to 50% by weight of calcium carbonate having an average particle size of from 1 to 7 μm, from 8 to 25% by weight of mica having an average particle size of from 1 to 10 μm, and one or more mold releasing agents.

5,589,525

PROCESS FOR PREPARING NOVEL HIGH SOLIDS NON-AQUEOUS POLYMER COMPOSITIONS

Wood E. Hunter, Pittsburgh; Kevin W. Frederick, Wexford, and Randy J. Loeffler, Carnegie, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 993,990, Dec. 21, 1992, abandoned. This application Sep. 30, 1994, Ser. No. 315,371

Int. Cl.[6] C08L *33/04*

U.S. Cl. 523—331 **16 Claims**

1. A method for removing water from a water-in-oil polymer composition which method comprises dehydrating said composition in a falling-film evaporator, wherein said composition comprises: 1) about 25 to about 74.5%, based on total composition weight, of an aqueous phase comprising about 10 to about 60%, based on the weight of 1), of a water soluble polymer and the balance water; 2) about 0.5 to about 20%, based on total composition weight, of at least one emulsifying surfactant; and 3) about 25 to about 74.5%, based on total composition weight, of a hydrophobic liquid; wherein said polymer is a water soluble polymer prepared from one or more ethylenically unsaturated monomers; and wherein the molecular weight of said polymer is not substantially degraded in the dehydration step.

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5,589,526

MASTER BATCH COMPOSITIONS CONTAINING ORGANIC PEROXIDES

Günter Sienel, Ebenhausen; Maximilian Dorn, Grünwald, and Heinz Zimmermann, München, all of Germany, assignors to Peroxid-Chemie GmbH, Pullach, Germany

Filed Oct. 13, 1995, Ser. No. 543,005

Claims priority, application Germany, Oct. 19, 1994, 44 37 465.8

Int. Cl.[6] C08K *5/14;* **C08L** *9/00*

U.S. Cl. 523—351 **19 Claims**

1. A master batch composition comprising:

an elastomeric carrier;

an organic peroxide in an amount of from 30 to 50% by weight based on the master batch composition;

a plasticizer;

a filling material; and optionally further additives compatible with the organic peroxide, wherein in addition to the elastomeric carrier, the composition contains a polyoctenamer.

5,589,527

PIGMENT GRINDING RESIN FOR ELECTRODEPOSITION PAINT AND PIGMENT PASTE CONTAINING THE SAME

Mitsuo Yamada, Suita, and Hiroyuki Nojiri, Takatsuki, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

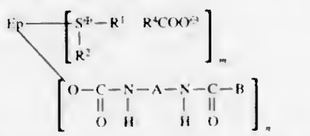
Filed Jan. 9, 1995, Ser. No. 370,105

Claims priority, application Japan, Jan. 10, 1994, 6-000785

Int. Cl.[6] C08K *3/20;* **C08L** *63/02*

U.S. Cl. 523—414 **9 Claims**

1. A pigment grinding resin represented by the formula:



wherein, Ep is a residue of a reacted epoxy resin of which the starting unreacted epoxy resin has an epoxy equivalent of 150 to 2000 and a hydroxyl group equivalent of 300 to 4000; R^1 represents a hydrophilic group selected from the group consisting of a 2-hydroxyethyl group and a group of the formula $-CH_2CH(OH)CH_2R^3$ wherein, R^3 is a hydroxyl group or a hydroxylalkyl group having 1 to 10 carbon atoms; R^2 represents a hydrophilic group selected from the group consisting of 3-hydroxypropyl, 2-hydroxypropyl and 4-hydroxybutyl; R^4 is selected from the group consisting of a hydrogen atom and alkyl, hydroxylalkyl and alkylamide groups having 1 to 5 carbon atoms; m is a numerical value of 0.1 to 2.0; A is a residue of diisocyanate selected from the group consisting of aliphatic, alicyclic and aromatic diisocyanates having 4 to 20 carbon atoms; B is a residue of a compound selected from the group consisting of an alcohol, an amine, a carboxylic acid, an oxime and a caprolactam having 1 to 20 carbon atoms; and n is a numerical value of 10.1 to 2.0

5,589,528

HOT MELT GLUE BASED ON MODIFIED WATERBEARING GELS

Lawrence S. Bogardy, 3243 Decker St., Bartlett, Tenn. 38124

Continuation of Ser. No. 259,024, Jun. 13, 1994, abandoned. This application Feb. 7, 1996, Ser. No. 598,089

Int. Cl.[6] C08L *89/00;* **C09J** *4/00*

U.S. Cl. 524—17 **21 Claims**

1. A biodegradable, water soluble, and repulpable hot melt adhesive comprising:

from 50 to 70% by weight hydrocolloids; and

from 25 to 50% by weight water;

said hot melt adhesive having a melting point below approximately 43° C.

5,589,529

DIMERIC BENZOTRIAZOLES AS UV ABSORBERS

Dieter Reinehr, Kandern, Germany; Jean-Pierre Bacher, Buschwiller, and André Schmitter, Hegenheim, both of France, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 392,638, Feb. 22, 1995, Pat. No. 5,488,112. This application Nov. 6, 1995, Ser. No. 554,215

Claims priority, application Switzerland, Feb. 24, 1994, 554/94

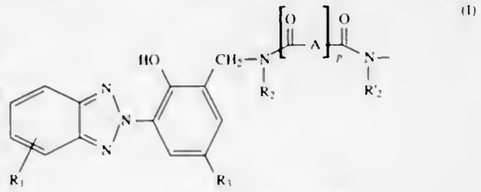
Int. Cl.[6] C08K *5/3475;* **C09K** *15/22*

U.S. Cl. 524—91 **15 Claims**

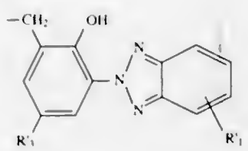
1. A composition comprising

A) an organic material which is sensitive to damage by light, oxygen and/or heat, and

B) an effective stabilizing amount of a compound of the formula I



(I)



in which

p is 0 or 1;

A is C_1–C_{12}alkylene;

R_1 and R'_1, independently of one another, are hydrogen, halogen, C_1–C_{18}alkyl, C_1–C_{18}alkoxy or —CN;

R_2 and R'_2, independently of one another, are hydrogen or C_1–C_{18}alkyl or together are C_2–C_{12}alkylene or C_2–C_{12}hydroxyalkylene; and

R_3 and R'_3, independently of one another, are hydrogen, halogen, C_1–C_{18}alkyl or C_1–C_{18}alkoxy.

5,589,530

STABILIZATION OF LOW MOLECULAR WEIGHT POLYBUTYLENE TEREPHTHALATE/POLYESTER BLENDS WITH PHOSPHORUS COMPOUNDS

Eileen B. Walsh, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 164,642, Dec. 8, 1993, Pat. No. 5,367,011, which is a continuation of Ser. No. 994,738, Dec. 22, 1992, abandoned. This application Sep. 19, 1994, Ser. No. 308,722

Int. Cl.[6] C08K *5/53;5/524;5/521;3/32*

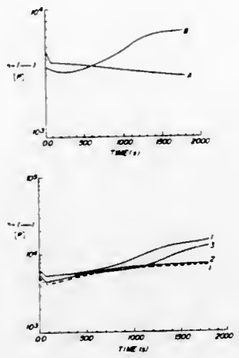
U.S. Cl. 524—152 **22 Claims**

1. A thermoplastic resin blend comprising:

(a) a relatively low molecular weight polybutylene terephthalate resin having a melt viscosity of less than 600 poise;

(b) a relatively high molecular weight polyester resin having a melt viscosity greater than 600 poise; and

(c) an effective melt viscosity stabilizing amount of (i) an acid, alkyl, aryl or mixed phosphite having at least one acidic hydrogen or alkyl group, (ii) a phosphorus oxo acid or (iii) a mixture of any of the foregoing.



5,589,531

PREPARATION AND USE OF PELLETIZED SUBMICRON PIGMENT POWDER/POLYMER COMPOSITIONS

Jameel Menashi; Robert C. Reid; Robert S. Whitehouse, all of Lexington, and David J. Kaul, Acton, all of Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Mar. 7, 1995, Ser. No. 399,475

Int. Cl.[6] C08K *3/10*

U.S. Cl. 524—409 **21 Claims**

1. A process for preparing co-pelletized submicron pigment powder/polymer products comprising the step of pelletizing a submicron pigment powder in a dry drum in the presence of thermoplastic polymeric seed pellets having a mean size in the range of 0.2 to 2.0 mm, wherein the submicron pigment powder to thermoplastic polymeric seed pellet weight ratio is in the range of 0.4:1 to 9:1.

5,589,532

SOLVENTLESS BUTADIENE-VINYLIDENE CHLORIDE ADHESIVES CONTAINING MACROMONOMERS FOR THE BONDING OF RUBBER TO METAL

I. Glen Hargis, Tallmadge; John P. Kovalchin, Akron; Satish C. Sharma, Stow; Raymond J. Weinert, Macedonia, and John A. Wilson, Akron, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed May 15, 1995, Ser. No. 440,586

Int. Cl.[6] C08K *3/22;* **C08L** *9/10*

U.S. Cl. 524—432 **9 Claims**

1. An adhesive composition, comprising:

a latex and a nitrosamine crosslinking agent or a precursor thereto said precursor comprising an oxime with an oxidant or a nitro compound with a reductant, said latex comprising:

the emulsion polymerization product from at least two unsaturated monomers wherein said unsaturated monomers comprise at least a conjugated diene having from 4 to 12 carbon atoms and at least an ethylene oxide macromonomer, wherein said ethylene oxide macromonomer comprises an unsaturated terminal group and from 2 to 40 ethylene oxide repeat units.

5,589,533

SELF-CROSSLINKING COMPOSITION, FORMING OBTAINED FROM THE COMPOSITION, AND METHOD FOR MANUFACTURING THE FORMING

Satoru Aikawa, Tokyo, Japan, assignor to Tajima Incorporated, Tokyo, Japan

Division of Ser. No. 421,873, Apr. 14, 1995. This application Dec. 26, 1995, Ser. No. 578,239

Claims priority, application Japan, May 24, 1994, 6-133620

Int. Cl.[6] C08F *8/00*

U.S. Cl. 524—529 **1 Claim**

1. A method for manufacturing a forming of floor material comprising blending:

(a) a vegetable oil having at least one unsaturated fatty acid or an ester of an unsaturated fatty acid as one of its components;

(b) a drier;

(c) at least one member that is capable of being crosslinked in the absence of a peroxide, wherein said member is selected from the group consisting of styrene-butadiene rubber, styrene-butadiene-acrylonitrile copolymer, styrene-butadiene-styrene block copolymer, styrene-isoprene-styrene block copolymer, styrene-ethylene-butylene block copolymer, ethylene-propylene-diene terpolymer, ethylene-vinyl acetate copolymer, ethylene-ethyl acrylate copolymer, low density polyethylene, very low density polyethylene, polybutadiene, and 1,2-syndiotactic polybutadiene; and

(d) a filler; to prepare a self-crosslinking composition which is free of a solvent and free of a crosslinking agent, wherein said self-crosslinking occurs at a crosslinking temperature;

forming said self-crosslinking composition into a specific shape at a first temperature lower than said crosslinking temperature; and

crosslinking said shape at a second temperature higher than said crosslinking temperature.

5,589,534

AQUEOUS COATING COMPOSITIONS INCLUDING A REACTIVE EMULSIFIER

Carl W. Metzger, Denkendorf; Bernhard H. Feith, Markgroningen; Ute Gruber, Remchingen; Angelika A. Zedler, Stuttgart, all of Germany, and Mario M. M. van Wingerde, Roosendaal, Netherlands, assignors to Akzo Nobel N.V., Netherlands

Continuation of Ser. No. 39,383, Apr. 16, 1993, abandoned. This application Jan. 10, 1994, Ser. No. 179,297

Claims priority, application European Pat. Off., Oct. 16, 1990, 90202769

Int. Cl.[6] C08L *37/00*

U.S. Cl. 524—548 **19 Claims**

1. An aqueous coating composition comprising (A) a generally lipophilic, crosslinkable binder, (B) optionally, a chemical curing/crosslinking agent for the crosslinkable binder and (C) an emulsifying agent which comprises a reactive amphiphatic emulsifier which has a lipophilic backbone having separately pendant therefrom:

(a) at least one activated unsaturated group; and

(b) at least one hydrophilic polyoxyalkylene group selected from the group consisting of

(1) a polyoxyalkylene monoalkylether group of the formula (I)

$$-O-[(C_3H_6O)_{n'}/(C_2H_4O)_{n1}]-R \qquad (I)$$

and

(2) a polyoxyalkylene monoamine monoalkylether group of the formula (II)

$$-N\begin{matrix} R^2 \\ [(C_3H_6O)_{n2}/(C_2H_4O)_{n3}]-R^1 \end{matrix} \qquad (II)$$

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wherein R is selected from the group consisting of a C_1 to C_4 alkyl group,

R^1 is selected from the group consisting of an H atom and a C_1 to C_4 alkyl group,

R^2 is selected from the group consisting of (i) an alkyl group having 1 to 20 carbon atoms, (ii) the residue of a hydrocarbon having 1 to 20 carbon atoms and having a group reactive with a nitrogen, and (iii) a polyoxyalkylene monoether group of the formula (III)

$$[(C_3H_6O)_{n4}/(C_2H_4O)_{n5}]-R^3 \quad \text{(III)},$$

R^3 is selected from the group consisting of a C_1 to C_4alkyl group,

n, n2 and n4 are independently 0 to 25,

n1 is 4 to 40 and

n3 and n5 are independently 0 to 40,

with the proviso that $n+n1 \leqq 50$, $4 \leqq n2+n3+n4+n5 \leqq 50$ and $n3+n5>4$;

the reactive amphiphatic emulsifier having an HLB value of at least about 6.0.

percent by weight of the total mass of polyol components (B) through (D); and wherein the equivalent ratio of isocyanate groups to the total number of hydroxyl groups in the polyols (B) through (D) is 1.05 to 1.4 which process comprises first preparing a polyurethane prepolymer from the polyisocyanates of (A), the polyols of (B) and optionally the polyols of (C) and the compounds of (D), which prepolymer contains on average at least 1.7 isocyanate groups per molecule, then reacting the prepolymer with the compounds of (E) and/or (F) in a non-aqueous system, and optionally then neutralizing the completely reacted polyurethane resin and transferring it into the aqueous system, it being possible for the further binder resins, if used, and the conventional additives to be added before, during and after the preparation of the polyurethane resin.

5,589,535

AIR-DRYING POLYURETHANE RESINS, THEIR PREPARATION AND USE

Michael Schwab, Mainz-Kosthelm; Gerd Walz, and Gerhard Merten, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 839,926, Feb. 21, 1992, abandoned, which is a continuation of Ser. No. 650,912, Feb. 5, 1991, abandoned. This application May 30, 1995, Ser. No. 454,019

Claims priority, application Germany, Feb. 15, 1990, 40 04 651.6

Int. Cl.[6] **C08J** *3/00;* **C08K** *3/20;* **C08L** *75/00;* **B32B** *27/00*

U.S. Cl. 524—591 **20 Claims**

1. A process for the preparation of an aqueous coating composition containing at least one water-dispersible polyurethane resin containing air-drying groups, the polyurethane having no residual NCO content and a degree of branching of up to 30% and optionally further binder resins and paint additives, which polyurethane resin contains structural units derived from

(A) polyisocyanates,

(B) polylols containing air-drying groups, made by reacting unsaturated fatty acids with polyepoxides,

(C) optionally polylols which are free of air-drying groups,

(D) compounds having at least two groups which are reactive with isocyanate groups and at least one group capable of anion formation,

(E) optionally monoalcohols containing air-drying groups,

(F) and optionally compounds which differ from (B), (C), (D) and (E) which act as chain terminators and which are selected from the group consisting of monofunctional compounds which react with NCO groups and compounds having active hydrogen of different reactivity towards NCO groups which are selected from the group consisting of compounds having a primary amino group and a secondary amino group, compounds having a hydroxyl and carboxyl group, compounds having a primary or secondary amino group and a hydroxyl group 1; wherein the functionality and amounts of the polyfunctional components (A) through (D) are chosen such that there is a degree of branching in the resulting polyurethane of up to 30%, and wherein the amount of component (B) is such that the content of unsaturated fatty acids within the polyurethane is between 25 and 50 percent by weight, and wherein the content of the isocyanate component (A) within the resulting polyurethane is from 10 to 40 percent by weight, the content of component (F) is from 0 to 10 percent by weight of the polyurethane resin, the content of component (B) within the resulting polyurethane resin is from 20 to 60 percent by weight; the content of structural units derived from component (D) within the polyurethane resin is from 2 to 20 per cent by weight; and the content of components (C) is from 0 to 10

5,589,536

GLASS FIBER BINDING COMPOSITIONS, PROCESS OF BINDING GLASS FIBERS, AND GLASS FIBER COMPOSITIONS

Carlo M. Golino, Evergreen; Thomas J. Taylor; William H. Kielmeyer, both of Englewood; Leo K. Thiessen, Littleton, all of Colo., and Carl A. Rude, Lafayette, Ind., assignors to QO Chemicals, Inc., and Schuller International, Inc.

Continuation of Ser. No. 886,668, May 19, 1992, abandoned. This application Mar. 13, 1995, Ser. No. 402,576

Int. Cl.[6] **C08L** *61/00*

U.S. Cl. 524—593 **36 Claims**

1. A glass fiber binding composition suitable for preparing a binder-coated glass fiber random mat product having a binder solids content of from 1 weight percent to about 25 weight percent, prepared by spraying freshly formed glass fibers with said binding composition, said weight percent binder solids relative to the weight of said binder-coated glass fiber random mat product, said binder-coated glass fiber random mat product being compressible in thickness by a factor of from about 4 to about 12, the interstitial voids between glass fibers being substantially free of binder, said binding composition comprising:

an effective binding amount of an aqueous compatible furan resin;

15 to 99 percent by weight water, the total being 100% by weight,

wherein said composition contains about 60 percent or more volatiles.

5,589,537

SINGLE PHASE SOLIDS OF POLYMERIZABLE METAL CLUSTERS

Josh H. Golden, Stamford, Conn.; Francis J. DiSalvo, and Jean M. J. Frechet, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 245,574, May 18, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 485,685

Int. Cl.[6] **C08K** *3/10;* **C08F** *30/04*

U.S. Cl. 524—780 **16 Claims**

1. A mixed organic-inorganic single phase solid comprising a homogeneous molecular mixture of a polymerized organic solvent and a metal cluster, wherein the metal cluster is dissolved in said solvent prior to polymerization thereof and contains chemically bound ligands copolymerizable with said solvent.

5,589,538

POLYURETHANE LOW PROFILE ADDITIVES FOR POLYESTER-BASED MOLDING COMPOSITIONS

Gary C. Rex, Cross Lanes, and Kenneth E. Atkins, South Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 258,658, Jun. 13, 1994, abandoned, which is a continuation of Ser. No. 815,255, Dec. 31, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 358,262

Int. Cl.[6] **C08L** *75/04;67/06*

U.S. Cl. 525—28 **9 Claims**

1. A method of preparing thermoset polyester composition comprising:

(1) preparing a mixture comprising the below-listed ingredients:

(a) an unsaturated polyester;

(b) an ethylenically unsaturated monomer which is copolymerizable with said unsaturated polyester;

(c) an esterified polyurethane low profile additive which comprises the reaction product of

(i) a polyisocyanate;

(ii) a polyol or polyol blend having an average functionality of 2 to 3 hydroxyl groups per molecule and a number average molecular weight of at least 500; and

(iii) a diol chain extender having between 2 and 32 carbon atoms per molecule;

to form a hydroxyl-terminated prepolymer which is further reacted with an anhydride in the presence of a catalyst comprising a diamine having no active hydrogens to esterify the hydroxyl-terminated prepolymer and form said esterified polyurethane low profile additive; and

(d) a pigment;

(2) forming the resulting mixture into a desired shape; and

(3) curing the formed mixture.

5,589,539

PROCESS FOR PREPARING AN IN SITU POLYETHYLENE BLEND

Burkhard E. Wagner, Highland Park, and Arakalgud V. Ramamurthy, East Windsor, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Nov. 23, 1994, Ser. No. 343,849

Int. Cl.[6] **C08L** *23/16;23/08;* **C08F** *297/08*

U.S. Cl. 525—53 **9 Claims**

1. A process for the production of an in situ particulate polyethylene blend comprising contacting a magnesium/titanium based catalyst system including a particulate precursor with one or more alpha-olefins in each of two or more reactors connected in series, in the gas phase, under polymerization conditions, with the provisos that:

(a) the particulate precursor has a particle size distribution span of no greater than 1.5 as introduced into the first reactor in the series;

(b) ethylene is introduced into each reactor;

(c) optionally, an alpha-olefin having at least 3 carbon atoms is introduced into at least one reactor;

(d) the mixture of ethylene polymer matrix and active catalyst formed in the first reactor in the series is transferred to the subsequent reactors in the series; and

(e) the polymerization conditions in each reactor are such that a high molecular weight polymer is formed in at least one reactor and a low molecular weight polymer is formed in at least one other reactor wherein the ratio of molecular weights of high molecular weight polymer to low molecular weight polymer in the final product is at least about 8:1.

5,589,540

SYNTHESES OF NEW TYPES OF CHELATING RESINS AND THEIR ADSORPTION PROPERTIES FOR NOBLE METALS

Dong Shihua, 900 Frances way, #211, Richardson, Tex. 75081

Filed Jan. 30, 1995, Ser. No. 379,915

Int. Cl.[6] **C08G** *63/91*

U.S. Cl. 525—65 **6 Claims**

1. A method of making a chelating resin adapted to selectively adsorb noble metals, comprising the step of reacting polyethyleneimine with at least one of the monomer selected from the group consisting of 2-chloromethylthiirane and epichlorohydrin.

5,589,541

PROCESS FOR PRODUCING MODIFIED PROPYLENE POLYMER AND MODIFIED PROPYLENE POLYMER COMPOSITION

Masafumi Kinoshita; Toshio Niwa, and O. Shibata, all of Osaka, Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo, Japan

Filed Mar. 28, 1995, Ser. No. 413,218

Claims priority, application Japan, Mar. 28, 1994, 6-57116; Oct. 12, 1994, 6-246170

Int. Cl.[6] **C08F** *255/02;* **C08L** *51/06*

U.S. Cl. 525—66 **20 Claims**

1. A process for producing a modified propylene polymer comprising the steps of

premixing a particulate propylene polymer having a specific surface area of 0.1 m_2/g or more with a vinyl monomer comprising styrene and

polymerizing the vinyl monomer by heating, melting, and kneading the premix at a temperature of a melting point of the premix or higher of from 150° to 250° C. in an extruder.

17. A resin composition comprising a modified polypropylene polymer according to any one of claims 1 to 5 or 8 and a resin selected from the group consisting of a polyamide resin, a polyester resin and a polyphenylene ether resin.

5,589,542

MULTIBLOCK HYDROGENATED POLYMERS FOR ADHESIVES

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 147,218, Nov. 3, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,033

Int. Cl.[6] **C08L** *53/02;* **C08F** *297/04*

U.S. Cl. 525—98 **1 Claim**

1. An adhesive composition comprising

(a) a nontapered multiblock copolymer of the formula

D-A-B-A

1) wherein A is a vinyl aromatic hydrocarbon polymer block having a peak molecular weight as determined by gel permeation chromatography of from 4000 to 35,000,

2) B is a hydrogenated butadiene polymer block having a peak molecular weight as determined by gel permeation chromatography of from 20,000 to 200,000, and the vinyl content of the polymer block is from 30 to 65 percent by weight,

3) D is a hydrogenated isoprene polymer block having a peak molecular weight as determined by gel permeation chromatography of from 5000 to 50,000,

4) the ratio of the molecular weight of D to the molecular weight of B ranges such that the normalized peak molecular weight as determined by gel permeation chromatography factor ranges from greater than 0 to 180×10^{-6}, and

5) the copolymer has a vinyl aromatic hydrocarbon content of from 9 to 35 percent by weight; and

(b) a tackifying resin.

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POLYURETHANE ELASTOMERS PREPARED FROM DIFUNCTIONAL TELECHELIC LINEAR NON-CROSSLINKED POLYOLEFINS

Howard B. Yokelson; Philip O. Nubel, both of Naperville, and Raymond T. Behrends, Lombard, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 3,536, Sep. 11, 1995, and a continuation-in-part of Ser. No. 68,236, May 27, 1993, Pat. No. 5,403,904, and a continuation-in-part of Ser. No. 68,240, May 27, 1993, Pat. No. 5,519,101, and a continuation-in-part of Ser. No. 167,668, Dec. 15, 1993, Pat. No. 5,512,635. This application Nov. 27, 1995, Ser. No. 563,197

Int. Cl.[6] C08L *75/14;* **C08G** *18/69*

U.S. Cl. 525—131 **11 Claims**

1. A hydrophobic polyurethane elastomer composition containing a linear soft segment without pendant chain branched groups, wherein said polyurethane elastomer has a glass transition temperature (Tg) of less than −70° C. and a moisture uptake of less than 1.0 wt % after 24 hours of immersion in water at 70° C., and wherein said polyurethane elastomer comprises at least one repeat unit containing said linear soft segment, which soft segment comprises a moiety derived from a polyol of the structure:

$$X—[CH{=}CH(CH_2)_n]_m CH{=}CH—X$$

wherein X is a hydroxyl-containing moiety selected from the group consisting of $—CH_2OH$, $—(CH_2)_nCOO(CH_2)_pOH$ and $—COO(CH_2)_pOH$, wherein the functionality number of the terminal groups is 2.0, p is 2 to 12, n is 1 to 10, m is a number average value of up to 1000, and the weight of said polyol is from about 0.5 wt. % to about 99.5 wt. % of said polyurethane elastomer, and the said polyurethane comprises the reaction product of:

(i) the said polyol; and

(ii) an isocyanate having a functionality of at least b 2; and

(iii) a chain extender selected from the group consisting of monomeric diols of from 2 to 20 carbon atoms and amines of from 2 to 20 carbon atoms.

5,589,544

SOFT THERMOPLASTIC ELASTOMERS HAVING IMPROVED RESISTANCE TO OIL SWELL AND COMPRESSION SET

Jacques Horrion, Tilff, Belgium, assignor to Advanced Elastomer Systems, L.P., Akron, Ohio

Filed May 15, 1995, Ser. No. 440,615

Claims priority, application European Pat. Off., Jul. 6, 1994, 94110498

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—176 **9 Claims**

1. A thermoplastic elastomeric composition comprising a blend of:

(a) about 10 to about 40 parts by weight of an engineering thermoplastic resin and

(b) about 90 to about 60 parts by weight of a cured rubber concentrate consisting essentially of cured rubber and a carrier, which has been previously obtained by mixing

(i) about 10 to about 90% by weight, based on the weight of (i) plus (ii), of a curable elastomeric copolymer (rubber);

(ii) about 90 to about 10% by weight, based on the weight of (i) plus (ii), of a polymeric carrier which is not miscible with the curable elastomeric copolymer as assessed by the presence of two different glass transition temperatures in the blend of (i) and (ii) and which carrier does not react with the curative used to vulcanize (i);

(iii) about 0.1 to about 5 parts by weight, based on 100 parts by weight of (i) plus (ii) of a curing agent (curative) for the curable elastomeric copolymer; and

(iv) optionally additives, under conditions of heat and shear in a melt mix at least until the maximum torque has been reached,

and

(c) up to about 10 parts by weight of a compatibilizer.

5,589,545

LUBRICIOUS POLYMER BLENDS COMPRISING POLYETHYLENE OXIDE, POLYETHYLENE AND A POLYLACTONE

Ramesh Ramachandran, North Brunswick, and Sharon A. Dinunzi, Middlesex, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jul. 18, 1994, Ser. No. 276,342

Int. Cl.[6] C08F *8/30;* **C08L** *23/00;71/02*

U.S. Cl. 525—184 **12 Claims**

1. A molded polymer blend comprising:

(a) from about 40 to 70 weight percent polyethylene;

(b) from about 25 to 50 weight percent poly(ethylene oxide); and

(c) from about 5 to 35 weight percent of a polylactone; wherein

(i) said poly(ethylene oxide) has a weight average molecular weight of from about 500,000 to 1,000,000 grams per gram mole;

(ii) said polymer blend exhibits a reduction in the coefficient of friction upon exposure to water; and

(iii) said polymer blend is substantially homogeneous.

5,589,546

SOLID GOLF BALL

Hidenori Hiraoka, and Yoshimasa Koizumi, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 53,235, Apr. 28, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,861

Claims priority, application Japan, Apr. 28, 1992, 4-135772

Int. Cl.[6] A63B *37/02*

U.S. Cl. 525—193 **4 Claims**

1. A one-piece solid golf ball formed from a rubber composition comprising

(a) 100 parts by weight of a butadiene rubber having at least 40% of cis-1,4-construction as base rubber,

(b) 1 to 35 parts by weight of vulcanized rubber powder,

(c) 5 to 50 parts by weight of a metal salt of an α,β-ethylenically unsaturated carboxylic acid as a co-crosslinking agent,

(d) 0.1 to 6 parts by weight of an organic peroxide as a vulcanizing agent, and

(e) a filler,

wherein said vulcanized rubber powder has a particle size of 0.1 to 1,000 μm and is prepared by pulverizing a vulcanized rubber having a JIS-C hardness of 40 to 95.

5,589,547

POLYOLEFIN COMPOSITION, MOLDED ARTICLE THEREOF AND MULTILAYERED LAMINATE

Kazuyuki Watanabe, and Satoshi Iwamoto, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 321,517

Claims priority, application Japan, Oct. 13, 1993, 5-280240

Int. Cl.[6] C08L *23/10;23/04*

U.S. Cl. 525—240 **3 Claims**

1. A film molded article obtained by extrusion molding of a polyolefin composition which comprises:

(A) 1 to 99% by weight of a polyolefin having the following properties of (a) to (e):

(a) a ratio (η_1/η_2) of kinematic viscosity η_1 at a frequency of 10^{-1} rad/sec to kinematic viscosity η_2 at a frequency of 10 rad/sec at a temperature of 190° C. according to a kinematic viscoelasticity determination method of 4 to 20,

(b) a crystalization peak temperature Tcp according to a Differential Scanning Calorimetry (DSC) of 110° to 130° C.,

(c) a ratio (Tmp/TcP) of melting peak temperature Tmp to crystallization peak temperature Tcp according to a Differential Scanning Calorimetry (DSC) of 1.1 to 1.5,

(d) Tmp/(Tmp-Tcp)=3.0 to 9.8, and

(e) a crystal structure exhibiting a-axial orientation in a diffraction pattern according to an X-ray diffraction method, and

(B) 99 to 1% by weight of a propylene resin having the following properties of (f) and (g) and a ratio (Mw/Mn) of weight average molecular weight Mw to number average molecular weight Mn according to a gel permeation gas chromatography of 4.0 to 5.5;

(f) a ratio (η_1/η_2) of kinematic viscosity η_1 at a frequency of 10^{-1} rad/sec to kinematic viscosity η_2 at a frequency of 10 rad/sec at a temperature of 190° C. according to a kinematic viscoelasticity determination method of below 4, and

(g) no crystal structure exhibiting a-axial orientation in a diffraction pattern according to an X-ray diffraction method.

5,589,548

PROCESS FOR PREPARING DIFUNCTIONAL TELECHELIC LINEAR NON-CROSSLINKED POLYOLEFINS

Philip O. Nubel, and Howard B. Yokelson, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 68,236, May 27, 1993, Pat. No. 5,403,904, and a continuation-in-part of Ser. No. 68,240, May 27, 1993, Pat. No. 5,519,101, and a continuation-in-part of Ser. No. 167,668, Dec. 15, 1993, Pat. No. 5,512,635. This application Jun. 2, 1995, Ser. No. 459,651

Int. Cl.[6] C08G *61/12;* **C08F** *4/69*

U.S. Cl. 525—247 **6 Claims**

1. A process for the preparation of a difunctional telechelic linear non-crosslinked polyolefin without pendant chain-branched groups wherein the functional groups consist essentially of ester moieties and are other than vinyl groups, the functionality number of said polyolefin as determined by NMR is 2.0, polydispersity is from 1.3 to 3.0, the polyolefin molecular structure is:

$$X—[CH{=}CH(CH_2)_n]_m CH{=}CH—X$$

wherein X is selected from the group consisting of —COOR, $—CH_2OC(O)R$, and $—(CH_2)_nCOOR$, wherein R is an alkyl group of from 1 to 8 carbon atoms, n is 1 to 10, and m is a number average value of up to 1000, which process comprises:

(i) reaction (A) comprising a metathesis reaction between olefinic compound linear acyclic esters of from 3 to 30 carbon atoms having at least one carbon-to-carbon double bond, selected from the group consisting of an alkyl undecylenate of up to 30 carbon atoms, allyl acetate, allyl propionate, allyl butyrate and vinyl acetate to prepare a linear difunctional olefinic compound product, and

(ii) reaction (B) comprising a ring-opening polymerization of a cyclic olefin in the presence of the product of reaction (A),

wherein olefinic compound co-products of lower molecular weight than said reaction products of reactions (A) and (B) are removed from reaction products of reactions (A) and (B) by suitable means comprising evaporation, crystallization, purging with an inert gas, and combinations thereof, and

wherein said reactions (A) and (B) are metathesis reactions in the presence of a catalyst composition comprising a metathesis catalyst (a) comprising a transition metal compound selected from the group consisting of transition metal halides, oxyhalides, oxides and organic ammonium salts; an activator (b) selected from the group consisting of organic tin compounds, alkylaluminum halides, alkoxyalkylaluminum halides and aryloxy-alkylaluminum halides, and an organic Lewis base (c), said metathesis catalyst (a) is present in an amount of from about 0.01 to about 50 millimoles per mole of said reactants, activator (b) is present in a molar ratio to metathesis catalyst (a) of from about 0.001:1 to about 200:1, and organic Lewis base (c) is present in a molar ratio to metathesis catalyst (a) of from about 0.1:1 to about 10,000:1, said reactions (A) and (B) conducted at a temperature of from about 0° C. to about 200° C. and a pressure of from about 1×10^{-6} mm Hg to about 30 atmospheres.

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MULTISTAGE PROCESS FOR THE (CO) POLYMERIZATION OF OLEFINS

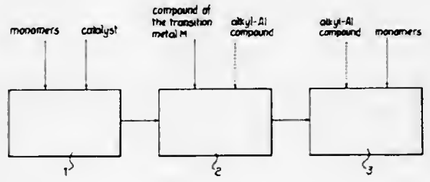
Gabriele Govoni, Renazzo; Mario Sacchetti, Ferrara, and Stefano Pasquali, Fossanova San Marco, all of Italy, assignors to Montell Technology Company bv, Hoofddorp, Netherlands

Filed Jun. 5, 1995, Ser. No. 461,136

Claims priority, application Italy, Jul. 20, 1994, MI94A1515

Int. Cl.[6] C08F *295/00;10/06*

U.S. Cl. 525—247 **22 Claims**



1. Process for the polymerization of one or more olefins $CH_2{=}CHR$, where R is hydrogen or an alkyl, cycloalkyl or aryl radical with 1–10 carbon atoms, characterized in that it comprises:

(I) a first stage of polymerization, in which one or more of said olefins $CH_2{=}CHR$ are polymerized, in one or more reactors, in the presence of a catalyst comprising the product of the reaction between an Al-alkyl compound and a solid component comprising at least one compound of a transition metal M' selected from Ti and V and not containing M'-π bonds and a Mg halide in active form, said catalyst being capable of producing an olefin polymer having porosity, expressed as percentage of voids, greater than 5%;

(II) a treatment stage, in which the product obtained in said first stage of polymerization (I) is contacted with a compound of a transition metal M selected from Ti, V, Zr and Hf containing at least one M-π bond and optionally with an alkyl-Al compound;

(III) a second stage of polymerization, in which one or more of the said olefins $CH_2{=}CHR$ are polymerized, in one or more reactors, in the presence of the product obtained in said stage (II).

5,589,550

PEROXIDE-CURED POLYACRYLATES

Paul E. Manley, Louisville, Ky., and Richard J. Flecksteiner, Crystal Lake, Ill., assignors to Zeon Chemicals Incorporated, Louisville, Ky.

Filed Oct. 25, 1995, Ser. No. 547,925

Int. Cl.[6] C08F *8/30*

U.S. Cl. 525—282 **7 Claims**

1. A process for curing a polyacrylate consisting essentially of at least 10 mole % of the structural unit

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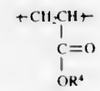
wherein R^1 is C_{4-8} alkyl; 0 to 20 mole % the structural unit

wherein R^2 is hydrogen, methyl, ethyl or cyano; and the balance to a total of 100% of the structural unit



wherein R^4 is C_{1-3} alkyl; which comprises heating the polyacrylate with 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane and m-phenylenediamine maleimide at a temperature in the range of 150°–220° C.

5,589,551

SWELL REDUCTION OF CHROMIUM CATALYZED HDPE RESINS BY CONTROLLED DEGRADATION USING HIGH TEMPERATURE PEROXIDES

John P. Bladt, Plainfield, and Pradeep P. Shirodkar, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 22, 1995, Ser. No. 391,858

Int. Cl.[6] C08J *3/24;* **C08L** *23/26*

U.S. Cl. 525—333.8 **8 Claims**

1. A modified high density polyethylene formed from a mixture comprising

a chromium catalyzed high density (0.94 to 0.97 g/cc) polymer of ethylene or copolymer of ethylene and an alpha olefin of 4 to 10 carbon atoms, containing 0.1 to 10 ppm Cr (elemental), and 10 to 1000 ppm of a high temperature peroxide with a half life temperature at 0.1 hours which is greater than 130° C.

wherein the modified high density polyethylene exhibits at least 30 percent increase in MFR because of crosslinking, and swell reduction determined by annular die swell in the range of 3 to 50 when compared to a base resin comprising said polymer or copolymer and free of peroxide.

5,589,552

COATINGS BASED ON POLYESTERS FROM PERFLUOROPOLYETHERS

Giovanni Simeone, Solaro; Fabrizio Mutta, Caronno Pertusella; Angelo Locaspi, Milan, and Claudio Tonelli, Concorezzo, all of Italy, assignors to Ausimont, S.p.A., Milan, Italy

Division of Ser. No. 234,661, Apr. 28, 1994, Pat. No. 5,476,721. This application Sep. 21, 1995, Ser. No. 531,925

Claims priority, application Italy, Apr. 28, 1993, MI93A0838

Int. Cl.[6] C08F *20/00;* **C08G** *73/24*

U.S. Cl. 525—440 **11 Claims**

1. Crosslinkable resins based on fluorinated polyesters having a high functionality and having a fluorine content of about 0.5–40% by weight, the cross-linkable resins being soluble in xylene at 70% based on the weight of xylene, the cross-linkable resins being obtained by reacting (i) a hydroxy-terminated perfluoropolyether having a number average molecular weight from 400 to 3000, (ii) a compound containing from 3 to 20 carbon atoms selected from the group consisting of acid anhydrides, diacids, and mixtures thereof, (iii) a diol containing from 3 to 20 carbon atoms, and (iv) a polyol containing from 3 to 20 carbon atoms and having a functionality of three or greater.

5,589,553

ESTERIFICATION PRODUCT OF AROMATIC NOVOLAK RESIN WITH QUINONE DIAZIDE SULFONYL GROUP

Anthony Zampini, Westborough, and Peter Trefonas, III, Medway, both of Mass., assignors to Shipley Company, L.L.C., Marlborough, Mass.

Filed Mar. 29, 1995, Ser. No. 413,089

Int. Cl.[6] C08L *61/06;61/14*

U.S. Cl. 525—504 **21 Claims**

1. A light sensitive resin that is the esterification product of (1) an alkali-soluble aromatic novolak resin having a molecular weight in excess of 1,200 Daltons and pendant phenolic hydroxyl groups and (2) an o-quinonediazide compound, said reaction product having pendant groups consisting of hydroxyl groups and a maximum of 20 percent hydroxyl groups esterified with said o-quinondiazide compound.

5,589,554

ADHESIVE COMPOSITION AND PROCESS FOR PREPARING IT

Soichiro Hiraoka, Otsuki, Japan, assignor to Three Bond Co., Ltd., Japan

Filed Sep. 16, 1994, Ser. No. 307,235

Claims priority, application Japan, Sep. 17, 1993, 5-253610

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—530 **20 Claims**

1. An adhesive composition which comprises a 2-cyanoacrylate and at least one of the following compounds (a) and (b):

(a) an adduct of an epoxy group and a cyano-containing carboxylic acid, and

(b) a cyano-containing carboxylic acid.

5,589,555

CONTROL OF A SOLUTION PROCESS FOR POLYMERIZATION OF ETHYLENE

Vaclav G. Zboril, Kingston, and Stephen J. Brown, Elginburg, both of Canada, assignors to Novacor Chemicals (International) S.A., Fribourg, Switzerland

Continuation of Ser. No. 70,369, Jun. 3, 1993, abandoned. This application Jul. 7, 1995, Ser. No. 499,646

Claims priority, application United Kingdom, Oct. 3, 1991, 9120971

Int. Cl.[6] C08F *4/654*

U.S. Cl. 526—64 **1 Claim**

1. A process for the solution polymerization of high molecular weight polymers of alpha olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_{3-12} alpha olefins at a temperature from 105° to 320° C. and a pressure from 4–20 MPa, said process comprising feeding to a tubular reactor kept under non-isothermal conditions or a series of reactors which operate under different conditions, monomer, selected from the group consisting of ethylene and mixtures of ethylene and at least one C_{3-12} alpha olefin, a hydrocarbon solvent and a catalyst; wherein said catalyst is prepared by in-line mixing at a temperature of less than 30° C.:

(i) a catalyst precursor prepared by the in-line mixing at a temperature of less than 30° C. of a mixture consisting of:

(a) MgR^1_2 and AlR^2_3 wherein each R^1 and R^2 is the same or different and is a C_{1-10} alkyl radical;

(b) a reactive halide; and

(c) titanium tetrachloride;

to provide a molar ratio of halide to magnesium from 2.2 to 2.4; magnesium to titanium of 5; and aluminum to titanium of 0.9; with

(ii) a catalyst activator prepared by in-line mixing at a temperature of less than 30° C. a composition consisting of:

(d) a first component which is an aluminum alkyl of the formula AlR_3 wherein R is an alkyl radical of the 2–8 carbon atoms; with

(e) an alcohol of the formula R^4 OH wherein R^4 is a C_{1-20} alkyl radical in a ratio of alcohol to aluminum from 0.1 to 1.

5,589,556

PROCESS AND CATALYST FOR PRODUCING CRYSTALLINE POLYOLEFINS

Abbas Razavi, Pâturage, Belgium, assignor to Fina Technology, Inc., Dallas, Tex.

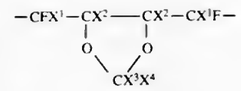
Division of Ser. No. 925,950, Aug. 5, 1992, Pat. No. 5,304,523, which is a continuation-in-part of Ser. No. 419,157, Oct. 10, 1989, Pat. No. 5,162,278, which is a continuation-in-part of Ser. No. 220,007, Jul. 15, 1988, Pat. No. 4,892,851. This application Jan. 21, 1994, Ser. No. 184,533

Int. Cl.[6] C07C *2/08;* **C08F** *4/64*

U.S. Cl. 526—170 **20 Claims**

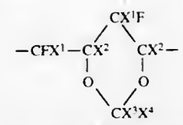
1. A process for the stereospecific propagation of a polymer chain derived form an ethylenically unsaturated monomer comprising:

(a) providing a catalyst comprising 1) a stereorigid neutral metallocene characterized by a metallocene ligand having ring structures joined to a coordinated transition metal atom, each of said ring structures being a substituted cyclopentadienyl ring and each of said ring structures being in a stereorigid relationship relative to said coordinating metal atom to prevent rotation of said rings structure, said stereorigid relationship being imparted by substituent groups on said ring structures and characterized by the formula:



a)

and

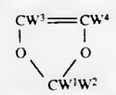


b)

wherein X^1, X^2, X^3 and X^4 have the meaning indicated above, at least one of the comonomers used in preparing said copolymers being a compound with an ethylene unsaturation having the structure:

$$CY^1Y^2{=}CY^3Z \qquad c)$$

wherein Y^1, y^2, y^3, equal to or different from each other, are F, Cl or H and Z is F, Cl, H, R^f or O—R^f with R^f perfluoroalkyl radical having from one to five carbon atoms, the compound containing at most 2 chlorine atoms; or



d)

wherein W^1 and W^2, equal to or different from each other, represent F or CF_3, W^3 represents F or H, and W^4 represents F, H, R^f or O—R^f with R^f perfluoroalkylic radical containing from 1 to 5 carbon atoms.

5,589,558

PROCESS FOR THE PREPARATION OF MODIFIED POLYTETRAFLUOROETHYLENE AND ITS USE

Bernd Felix, Burgkirchen; Klaus Hintzer, Kastl; Gernot Löhr, Burgkirchen, and Thomas Schöttle, Burghausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 310,633, Sep. 22, 1994. This application Jun. 7, 1995, Ser. No. 473,261

Claims priority, application Germany, Sep. 25, 1993, 43 32 712.5

Int. Cl.[6] C08F *16/24*

U.S. Cl. 526—247 **3 Claims**

1. A process for the preparation of a polymer of tetrafluoroethylene having a content of 0.01 to 1% by weight of perfluoro-(alkyl vinyl) ether units with 1 to 4 carbon atoms in the perfluoroalkyl chain, which comprises the step of reacting the monomers by suspension process in an aqueous medium containing initiators and polymerization auxiliaries, in the essential absence of ammonium salts.

5,589,557

FLUORINATED POLYMERS AND COPOLYMERS CONTAINING CYCLIC STRUCTURES

Walter Navarrini; Vito Tortelli, both of Milan, and Alessandro Zedda, La Spezia, all of Italy, assignors to Ausimont, S.p.A., Milan, Italy

Filed May 15, 1995, Ser. No. 441,197

Claims priority, application Italy, May 19, 1994, 94A001011

Int. Cl.[6] C08F *16/24*

U.S. Cl. 526—247 **9 Claims**

1. Polymers and copolymers of one or more fluorinated dienes of structure $CFX^1{=}CX^2{-}O{-}CX^3X^4{-}O{-}CX^2{=}CX^1F$, wherein X^1 and X^2, equal to or different from each other, are F, Cl or H, and X^3 and X^4, equal to or different from each other, are F or CF_3, said dienes essentially forming cyclic repetitive units having the structures:

5,589,559

FLUOROELASTOMER AND PROCESS FOR PRODUCING THE SAME

Satoru Saito, Kitaibaraki; Haruyoshi Tatsu, Ibaraki, both of Japan, and Lev S. German, deceased, late of Moscow, Russian Federation, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed Oct. 4, 1995, Ser. No. 538,936

Claims priority, application Japan, Oct. 4, 1994, 6-266246

Int. Cl.[6] C08F *16/24*

U.S. Cl. 526—247 **2 Claims**

1. A fluoroelastomer having a copolymer composition comprising 50 to 80% by mole of tetrafluoroethylene, 20 to 45% by mole of perfluoro(lower alkyl vinyl ether) and 0.1 to 2% by mole of

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perfluoro(allylbenzene), the sum total being 100% by mole, and an intrinsic viscosity of 0.1 to 2.0 dl/g.

5,589,560

CURABLE COMPOSITIONS INCORPORATING ANHYDRIDE-FUNCTIONAL POLYMERS DERIVED FROM ALKENYL SUCCINIC ANHYDRIDE

Richard S. Valpey, III, Matteson; Thomas W. Yokoyama, Chicago; John D. Kraan, Hometown, all of Ill., and H. James Harwood, Stow, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 176,046, Jan. 3, 1994, Pat. No. 5,480,951. This application Dec. 21, 1995, Ser. No. 575,980

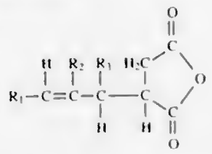
Int. Cl.[6] C08F *222/04;224/00;222/02;220/10*

U.S. Cl. 526—271 **16 Claims**

1. A curable composition which comprises:

(a) an anhydride-functional polymer obtained by polymerizing under free radical addition polymerization reaction conditions, a monomer mixture comprising:

(i) 20 to 75 weight percent of an alkenyl succinic anhydride having the structure:



wherein R_1, R_2 and R_3 are each independently hydrogen or alkyl or substituted alkyl of 1 to about 30 carbons; and

(ii) 25 to 80 weight percent of at least one (meth)acrylic monomer copolymerizable with the alkenyl succinic anhydride; and, optionally,

(iii) 0 to 75 weight percent of at least one unsaturated monomer, other than a (meth)acrylic monomer, which is copolymerizable with the anhydride and the (meth)acrylic monomer; and

(b) an acid-functional compound having an average of at least two carboxylic acid groups per molecule; and

(c) an epoxy-functional compound.

5,589,561

BIORIENTED BLOWN FILM

Russell P. Barry, and Bernard Pellereau, both of Richterswil, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 108,875, Aug. 18, 1993, abandoned, which is a division of Ser. No. 535,097, Jun. 8, 1990, Pat. No. 5,241,030. This application Nov. 20, 1995, Ser. No. 560,599

Claims priority, application United Kingdom, Jun. 27, 1989, 8914703

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.[6] B32B *27/10;* **C08L** *23/20*

U.S. Cl. 526—348.1 **6 Claims**

1. A mono- or multilayered bioriented blown film having a degree of orientation as indicated by a stretching ratio of 3:1 to 8:1 in the machine direction and of 6:1 to 9:1 in the cross-direction wherein at least one layer of the film includes as film-forming polymers

(A) from 75 to 100 percent of at least one linear ethylene/alpha-olefin copolymer having a density of from 0.890 g/cm^3 to 0.930 g/cm^3 and

(B) from 25 to 0 percent of at least one high density linear polyethylene having a density of from 0.935 g/cm^3 to 0.960 g/cm^3,

all percentages being based on the total weight of (A) and (B), with the proviso that the total of the film-forming polymers (A) and (B) has a single melting point as determined by differential scanning calorimetry according to ASTM D-3417.

5,589,562

POLYMERS CONTAINING ALTERNATING SILSESQUIOXANE AND BRIDGING GROUP SEGMENTS AND PROCESS FOR THEIR PREPARATION

Joseph D. Lichtenhan, Palmdale; Ngo Quang Vu, San Diego; Jeffrey W. Gilman, Landcaster, and Frank J. Feher, Costa Mesa, all of Calif., assignors to The University of Dayton, Dayton, Ohio

Continuation of Ser. No. 105,148, Aug. 12, 1993, Pat. No. 5,412,053. This application Feb. 3, 1995, Ser. No. 382,854

Int. Cl.[6] C08G *77/04*

U.S. Cl. 528—9 **10 Claims**

1. A process for the synthesis of polymers containing alternating silsesquioxane and bridging group segments comprising the steps of:

a) providing a difunctional silsesquioxane of the formula $Si_8R_8O_{11}(OA)_2$, OA is —OH, —OSb(CH$_3$)$_4$, —OSn(CH$_3$)$_3$, or —OTl, R is an alkyl, alkenyl, aryl, or alkoxy group; and

b) reacting said difunctional silsesquioxane with a difunctional compound of the formula X-M-X, where M is a silane, a siloxane, or an organometallic bridging group, and X is $(CH_3)_2N$—, $H_8C_4NC(O)(C_6H_5)N$—, —CH$_3$, or —Cl, for a time sufficient to condense the difunctional silsesquioxane monomers and difunctional compound X-M-X into a linear polymer having the formula $[—O—Si_8R_8O_{11}—O—M—]_n$ where n is a number which provides a weight average molecular weight for said polymer of from about 18,000 to 200,000.

5,589,563

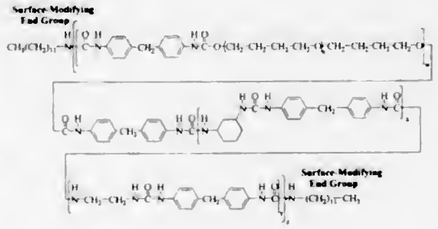
SURFACE-MODIFYING ENDGROUPS FOR BIOMEDICAL POLYMERS

Robert S. Ward, Lafayette, and Kathleen A. White, Pleasant Hill, both of Calif., assignors to The Polymer Technology Group, Calif.

Continuation-in-part of Ser. No. 52,361, Apr. 23, 1993, Pat. No. 5,428,123, which is a continuation-in-part of Ser. No. 874,336, Apr. 24, 1992, abandoned. This application Apr. 1, 1994, Ser. No. 221,666

Int. Cl.[6] C08G *18/00*

U.S. Cl. 528—44 **51 Claims**



1. A surface active endgroup-containing polymer that comprises a linear base polymer having covalently bonded surface active endgroups of a nature and present in an amount such that said polymer has a surface or interfacial tension that differs by at least 1 dyne/cm from the surface or interfacial tension of an otherwise identical polymer having diethylamino endgroups.

5,589,564

WIRE-WETTING FALL POLYMONIZATION PROCESS FOR THE PRODUCTION OF POLYCARBONATES

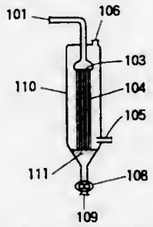
Kyosuke Komiya, Kurasaki; Yoshifumi Kawakami, Fuji, and Hiroshige Okamoto, Okayama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 530,274, Sep. 1, 1995. This application Feb. 1, 1996, Ser. No. 595,081

Claims priority, application Japan, Jul. 23, 1993, 5-182896

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—196 **16 Claims**



1. A method for producing an aromatic polycarbonate, which comprises:

feeding, to a feeding zone having a foraminous plate, at least one polymerizing material selected from the group consisting of:

a molten monomer mixture of an aromatic dihydroxy compound and a diaryl carbonate, and

a molten prepolymer obtained by a process comprising reacting an aromatic dihydroxy compound with a diaryl carbonate,

said foraminous plate having at least one hole, said feeding zone communicating, through said at least one hole, with a polymerization zone comprising a wire-wetting fall polymerization reaction zone, said wire-wetting fall polymerization reaction zone having at least one wire in correspondence with said at least one hole, said at least one wire being securely held at one end thereof in an upper end portion of said wire-wetting fall polymerization reaction zone and extending downwardly through said wire-wetting fall polymerization reaction zone, so that said polymerizing material fed to the feeding zone is enabled to pass downwardly through said foraminous plate and fall along and in contact with said at least one wire toward the other end of said at least one wire, and

allowing said polymerizing material to pass downwardly through said foraminous plate and fall along and in contact with said at least one wire through a wire-wetting fall polymerization reaction zone, to effect a wire-wetting fall polymerization of said polymerizing material,

thereby obtaining a polymer at a bottom of said polymerization zone comprising said wire-wetting fall polymerization reaction zone.

5,589,565

WATER-SOLUBLE CONDUCTING POLYPHENYLENE VINYLENE POLYMERS

Fred Wudl, and Alan Heeger, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Oakland, Calif.

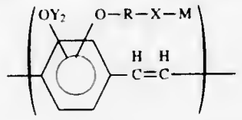
Division of Ser. No. 636,914, Jan. 2, 1991, Pat. No. 5,367,041, which is a division of Ser. No. 616,743, Nov. 16, 1990, Pat. No. 5,310,781, which is a continuation of Ser. No. 243,530, Sep. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 156,928, Dec. 14, 1987, abandoned. This application Mar. 8, 1993, Ser. No. 28,507

Claims priority, application WIPO, Sep. 29, 1986, PCT/US86/0242

Int. Cl.[6] C08G *61/00*

U.S. Cl. 528—205 **5 Claims**

1. A water-soluble conducting self-doping polymer having along its backbone a π-electron conjugated system which comprises approximately 100–500 p-phenylene-vinylene units, wherein between about 0.01 and 100 mole % of said p-phenylene-vinylene units have covalently linked thereto at least one Bronsted acid group, wherein said p-phenylene-vinylene units having said Bronsted unit covalently linked thereto have the structural formula:



wherein

Y_2 is a linear or branched (C_1–C_{10}) alkyl or aryl;

R is a linear or branched (C_1–C_{10}) alkylene or ether;

X is a Bronsted acid anion; and

M is a positive monovalent counter-ion.

5,589,566

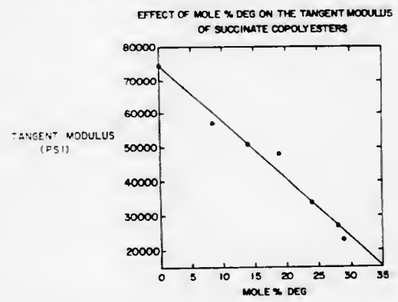
COPOLYESTERS HAVING REPEAT UNITS DERIVED FROM SUCCINIC ACID

Alan W. White, Kingsport; Barry G. Pearcy, Mount Carmel; Alian S. Jones, Church Hill; Charles M. Buchanan, Bluff City, and Robert M. Gardner, Gray, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 459,442, Jun. 2, 1995, Pat. No. 5,498,453, which is a division of Ser. No. 209,500, Mar. 7, 1994, Pat. No. 5,480,962, which is a division of Ser. No. 96,752, Jul. 22, 1993. This application Mar. 1, 1996, Ser. No. 609,188

Int. Cl.[6] C08G *63/82*

U.S. Cl. 528—286 **7 Claims**



1. A process for preparing high molecular weight aliphatic copolyesters having good color comprising the following steps:

(i) combining aliphatic copolyester forming monomers with a titanium-based catalyst system and phosphorus-based additive,

(ii) in a first stage, heating said reaction mixture between 190° and 220° C. at or slightly above atmospheric pressure, and

(iii) in a second stage, heating said reaction mixture between 245° and 260° C. under a reduced pressure of 0.05 to 2.00 mm of Hg.

5,589,567

Patent Not Issued For This Number

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5,589,568

METHODS AND COMPOSITIONS FOR MODULATING G PROTEIN ACTION

Tsutomu Higashijima, and Elliott M. Ross, both of Dallas, Tex., assignors to Board of Regents, The University of Texas, Austin, Tex.

Continuation of Ser. No. 748,319, Aug. 21, 1991, abandoned. This application Apr. 22, 1994, Ser. No. 232,453

Int. Cl.[6] A61K *37/02;* **C07K** *14/00;7/08*

U.S. Cl. 530—324 **85 Claims**

1. A peptide other than MP, MP-A or MP-T, the peptide being from 12 to 26 amino acids in length and including within its structure a G protein modulator region comprising:

a) a mastoparan analog region including the following formula:

AA_1-AA_2-AA_3-AA_4-AA_5-AA_6-AA_7-AA_8-AA_9-AA_{10}-AA_{11}-AA_{12} (Seq id no:70)

wherein:

AA_1=L, W, A, F or Y;

AA_2=K, A, R or Q;

AA_3=A or K;

AA_4–L, W, I, A, K or F;

AA_5=A, L, K, C or R;

AA_6=A, D or K;

AA_7=L, C,, W, A, F or K;

AA_8=A, V, K or R;

AA_9=K, R, Q or A;

AA_{10}=K, A, R or N;

AA_{11}=L, I,, W, V, A or K; and

AA_{12}=L, A or C; or

b) a receptor analog region comprising CVYREAKEQIRKIDRVL (Seq id no:48); CVYREAKEQIRKIL (Seq id no:49); IVYREAKEQIRKIDRVL (Seq id no:50); IVYREAKEQIRKIL (Seq id no:51); CIYRETENRARELAALQGSET (Seq id no:52); CIYRETENRARELAALQGSETIL (Seq id no:53); CVYIVAKRTTKNLEAGVMKEIL (Seq id no:54); CVYIVAKRTTKNLEIL (Seq id no:55); CVFQVAKRQLQKIDKVL (Seq id no:56); CPLSYRAKRTPRRAALM (Seq id no:57); CPFRYQSLMTRARAKVI (Seq id no:58); REHKALKTLGIIC (Seq id no:59); CRSPDFRKAFKRLLC (Seq id no:60); CVYREAKEQIRKIDR (Seq id no:61); CISRASKSRIKKDKKEPVAIL (Seq id no:62); CISRASKSRIKKDKKIL (Seq id no:63); CVYVVAKRESRGLKSGLKTDIL (Seq id no:64); or CVYVVAKRESRGLKIL (Seq id no:65).

5,589,569

Patent Not Issued For This Number

5,589,570

INTEGRIN ALPHA SUBUNIT CYTOPLASMIC DOMAIN POLYPEPTIDES AND METHODS

Richard N. Tamura, San Diego, and Vito Quaranta, La Jolla, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 695,564, May 3, 1991, Pat. No. 5,310,874. This application May 10, 1994, Ser. No. 241,387

Int. Cl.[6] C07K *14/47*

U.S. Cl. 530—350 **2 Claims**

1. An isolated polypeptide of about 24 to about 1091 amino acid residues in length having a sequence that corresponds in sequence to the $\alpha_{6,8}$ subunit sequence shown in SEQ ID NO 3 and the includes the $\alpha_{6,8}$ cytoplasmic domain from residues 1068 to 1091 shown in SEQ ID NO 3.

5,589,571

PROCESS FOR PRODUCTION OF INHIBITED FORMS OF ACTIVATED BLOOD FACTORS

Robert King, Fremont, Calif., assignor to COR Therapeutics, Inc., South San Francisco, Calif.

Filed Oct. 28, 1994, Ser. No. 330,978

Int. Cl.[6] C07K *14/745;1/18;* **A61K** *38/36;* **C12P** *21/06*

U.S. Cl. 530—381 **16 Claims**

1. A process for preparing an inhibited form of an activated blood factor, comprising the steps of providing a partially purified preparation containing the blood factor, treating the partially purified preparation to convert the blood factor to an activated blood factor and to convert the activated blood factor to an inhibited form in a single step, and then recovering the resulting inhibited activated blood factor.

5,589,572

PROCESS FOR PRODUCTION OF INHIBITED FORMS OF ACTIVATED BLOOD FACTORS

Robert King, Fremont, Calif., assignor to COR Therapeutics, Inc., South San Francisco, Calif.

Continuation of Ser. No. 330,978, Oct. 28, 1994. This application Jun. 7, 1995, Ser. No. 474,042

Int. Cl.[6] C07K *14/745;1/18;* **A61K** *38/36;* **C12P** *21/06*

U.S. Cl. 530—381 **13 Claims**

1. A process for preparing an inhibited form of an activated blood factor, comprising the steps of providing a partially purified preparation containing a blood factor selected from the group consisting of Factors II, V, IX, XI, XII, Protein C, Protein S, and fibrinogen, treating the partially purified preparation to convert the blood factor to an activated blood factor and to convert the activated blood factor to an inhibited form in a single step, and then recovering the resulting inhibited activated blood factor.

5,589,573

AMINO ACID SEQUENCES OF ANTI-IDIOTYPIC ANTIBODIES AGAINST ANTI-CANCER HUMAN MONOCLONAL ANTIBODY, AND DNA BASE SEQUENCES ENCODING THOSE SEQUENCES

Hideaki Hagiwara, Takarazuka, and Yasuyuki Aotsuka, Koube, both of Japan, assignors to Yoshihide Hagiwara, Takarazuka, Japan

Filed Oct. 6, 1994, Ser. No. 318,970

Claims priority, application Japan, Oct. 6, 1993, 5-272950

Int. Cl.[6] C07K *16/42;* **A61K** *51/10*

U.S. Cl. 530—387.2 **5 Claims**

1. An Fv region fragment comprising the immunoglobulin H chain variable region fragment having the formula of SEQ ID No. 31 and the immunoglobulin L chain variable region fragment having the formula of SEQ ID No. 35.

5,589,574

ASSAY FOR BONE ALKALINE PHOSPHATASE

Robert L. Wolfert, San Diego, and Craig S. Hill, Encinitas, both of Calif., assignors to Hybritech, Incorporated, San Diego, Calif.

Continuation of Ser. No. 239,185, May 5, 1994, Pat. No. 5,525,473, which is a continuation of Ser. No. 850,013, Mar. 10, 1992, abandoned, which is a continuation of Ser. No. 304,521, Jan. 31, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 458,740

Int. Cl.[6] C07K *16/40*

U.S. Cl. 530—388.26 **6 Claims**

1. A monoclonal antibody which specifically binds to BAP that is less than 20% cross-reactive with LAP in the presence of BAP in serum.

5,589,575

PURIFICATION OF HAPTEN-CARRIER GENERATED ANTIBODIES

Huguette Cohen, and Ross E. Williams, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Agriculture, Ottawa, Canada

Continuation-in-part of Ser. No. 917,394, Jul. 23, 1992, abandoned, and Ser. No. 56,797, May 4, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 300,517

Int. Cl.[6] C07K *1/22;16/00*

U.S. Cl. 530—413 **7 Claims**

1. A method for removing anticarrier antibodies from a mixture of antibodies contained in a liquid medium, which mixture was generated in a host animal in the presence of the antigenic carrier, which process comprises:

(i) contacting the liquid medium containing the mixture of antibodies with a high surface area solid form of the same antigenic carrier;

(ii) incubating the solid form of the antigenic carrier in contact with the medium containing the mixture of antibodies at a temperature, and for a time period, sufficient for adsorption of the anticarrier antibodies by the solid form of the antigenic carrier to be substantially complete; and

(iii) thereafter separating the solid form of the antigenic carrier together with the adsorbed anticarrier antibodies from the liquid medium.

5,589,576

CORES FOR TECHNETIUM RADIOPHARMACEUTICALS

Colin M. Archer, Buckinghamshire; Jonathan R. Dilworth; Panna Jobanputra, both of Essex; Ian A. Latham, Buckinghamshire, and Russell M. Thompson, Essex, all of England, assignors to Amersham International plc, Buckinghamshire, England

Continuation of Ser. No. 689,763, May 29, 1991, abandoned. This application Aug. 12, 1994, Ser. No. 289,654

Claims priority, application United Kingdom, Aug. 29, 1989, 8919488

Int. Cl.[6] C07F *13/00;* **A61K** *51/04*

U.S. Cl. 534—14 **8 Claims**

1. A complex of ^{99m}Tc of formula:

$L_nTc{=}NR$, $L_nTc{-}N{=}NY$ or $L_nTc({-}N{=}NY)_2$

where

L is a mono-dentate or multi-dentate organic ligand;

n is 1, 2, 3 or 4;

R is C_{1-10} aryl, alkyl, alkoxyalkyl, aminoalkyl or thioether group;

or is the group $=NR^1R^2$;

Y is a C_{1-10} aryl, alkyl, alkoxyalkyl, aminoalkyl or thioether group;

R^1 and R^2 are H, an aliphatic or cyclic C_{1-10} alkyl group or a C_{1-10} aryl, alkoxyalkyl, aminoalkyl or thioether group;

R^1 and R^2 may be the same or different provided that both are not H.

5,589,577

APPLICATIONS AND METHODS FOR THE PREPARATION OF FATTY ACID ESTERS OF POLYSACCHARIDES

Soili Peltonen, Rajamäki, and Kai Harju, Vantaa, both of Finland, assignors to Alko Group Ltd., Helsinki, Finland

PCT No. PCT/FI94/00119, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO94/22919, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 30, 1994, Ser. No. 325,358

Claims priority, application Finland, Apr. 7, 1993, 931592; Apr. 7, 1993, 931593

Int. Cl.[6] C07H *19/00*

U.S. Cl. 536—221 **106 Claims**

1. Fatty acid esters of a polysaccharide wherein the fatty acid fraction is at least 80% when the polysaccharide is made up of sugar monomers having 6 carbon atoms and wherein the fatty acid fraction is at least 60% when the polysaccharide is made up of sugar monomers having 5 carbon atoms.

5,589,578

Patent Not Issued For This Number

5,589,579

GENE SEQUENCE AND PROBE FOR A MARKER OF NON-SMALL CELL LUNG CARINOMA

Richard M. Torczynski, and Arthur P. Bollon, both of Dallas, Tex., assignors to Cytoclonal Pharmaceutics, Inc., Dallas, Tex.

Filed Jul. 19, 1994, Ser. No. 276,919

Int. Cl.[6] C12Q *1/68;* **C07H** *21/02*

U.S. Cl. 536—23.1 **15 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence encoding the amino acid sequence depicted in SEQ ID NO:2.

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5,589,580

RIBOZYMES

James P. Haseloff, O'Connor; Wayne L. Gerlach, Hughes; Philip A. Jennings, West Chatswood, and Fiona H. Cameron, Forestville, all of Australia, assignors to Gene Shears Pty. Limited, Neutral Bay, Australia

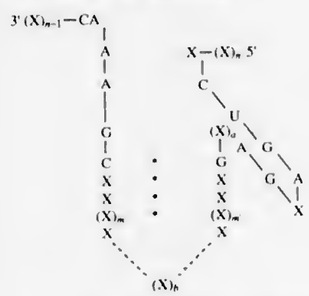
Continuation of Ser. No. 967,693, Oct. 27, 1992, Pat. No. 5,494,814, which is a continuation of Ser. No. 926,148, Aug. 5, 1992, Pat. No. 5,254,678, which is a continuation of Ser. No. 536,625, Aug. 14, 1990, abandoned. This application Feb. 8, 1994, Ser. No. 195,747

Claims priority, application Australia, Dec. 15, 1987, PI5911/87; Aug. 19, 1988, PI9950/88; Sep. 9, 1988, PJ0353/88; Nov. 4, 1988, PJ1304/88; Nov. 7, 1988, PJ1333/88

Int. Cl.[6] C12N *15/11;15/70;15/74;15/79*

U.S. Cl. 536—23.2 **7 Claims**

1. A compound having the formula:



wherein each X represents a nucleotide which may be the same or different;

wherein each of $(X)_{n-1}$ and $(X)_{n'}$ represents an oligonucleotide having a predetermined sequence which is (a) capable of hybridizing with an RNA target sequence to be cleaved and (b) does not naturally occur covalently bound to the sequences C-A-A-A-G-C- and X-C-U-G-A-, respectively, such RNA target sequence not being present within the compound;

wherein each of n−1 and n' represents an integer which defines the number of nucleotides in the oligonucleotide with the proviso that the sum of n+n' is greater than or equal to 14;

wherein each • represents base pairing between the nucleotides located on either side thereof;

wherein each solid line represents a chemical linkage providing covalent bonds between the nucleotides located on either side thereof;

wherein a represents an integer which defines a number of nucleotides with the proviso that a may be 0 or 1 and if 0, the A located 5' of (X), is bonded to the G located 3' of $(X)_n$;

wherein each of m and m' represents an integer which is greater then or equal to 1 and less than or equal to 5;

wherein each of the dashed lines independently represents either a chemical linkage providing covalent bonds between the nucleotides located on either side thereof or the absence of any such chemical linkage; and

wherein $(X)_b$ represents an oligonucleotide which may be present or absent with the proviso that b represents an integer which is greater than or equal to 2 if $(X)_b$ is present.

5,589,581

DNA SEQUENCES USEFUL FOR THE SYNTHESIS OF CAROTENOIDS

Norihiko Misawa; Kazuo Kobayashi, and Katsumi Nakamura, all of Takasaki, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo-To, Japan

Continuation of Ser. No. 519,011, Apr. 19, 1990, abandoned. This application Mar. 10, 1994, Ser. No. 209,617

Claims priority, application Japan, Apr. 21, 1989, 1-103078; Mar. 5, 1990, 2-53255

Int. Cl.[6] C07H *21/04;* **C12N** *11/18;9/02;9/90*

U.S. Cl. 536—23.2 **6 Claims**

1. An isolated and purified DNA encoding a polypeptide which has an enzymatic activity involved in carotenoid biosynthesis and whose amino acid sequence is from A to B of the amino acid sequence shown in FIGS. 1(*a*) and (*b*).

5,589,582

POLYNUCLEOTIDES EN CODING PORCINE CYTOKINES

Robert J. Hawley, Newton; Rodney L. Monroy, Rockport; Margaret D. Rosa, Winchester, all of Mass.; Bernice Z. Schacter, Madison, Conn., and Paul D. Ronath, Boston, Mass., assignors to BioTransplant, Inc., Charlestown, Mass.

Continuation-in-part of Ser. No. 967,188, Oct. 27, 1992, abandoned. This application Oct. 8, 1993, Ser. No. 133,979

Int. Cl.[6] C12N *15/19;* **C07K** *14/52*

U.S. Cl. 536—23.5 **31 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence which is at least 90% identical to a polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding a protein comprising amino acid sequence 1–180 of SEQ ID NO:4; and

(b) a polynucleotide complementary to (a).

5,589,583

PLANT PROMOTER

Harry J. Klee, Ballwin, and James S. Elmer, Ellisville, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 11, 1990, Ser. No. 463,682

Int. Cl.[6] C12N *15/82;15/11;15/67;* **A01H** *5/00*

U.S. Cl. 536—24.1 **17 Claims**

1. An isolated DNA molecule consisting essentially of a plant promoter region from *Arabidopsis thaliana* located upstream to a structural DNA sequence which hybridizes to a cDNA probe derived from the structural DNA sequence shown in FIG. 1, said plant promoter region, when operably linked to a heterologous gene, causes transcription in meristematic tissue or regions of rapidly dividing plant cells.

5,589,584

ANGIOTENSINOGEN GENE VARIANTS AND PREDISPOSITION TO HYPERTENSION

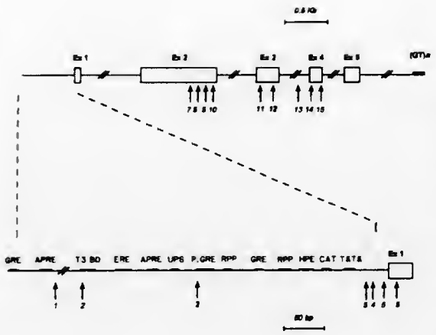
Jean-Marc Lalouel, Salt Lake City, Utah; Xavier Jeunemaitre, Paris, France; Richard P. Lifton, Salt Lake City, Utah; Florent Soubrier, Paris, France; Youri Kotelevtsev, Edinburgh, United Kingdom, and Pierre Corvol, Paris, France, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Division of Ser. No. 952,442, Sep. 30, 1992, Pat. No. 5,374,525. This application Jul. 1, 1994, Ser. No. 269,766

Int. Cl.[6] C07H *21/04;* **C12Q** *1/68*

U.S. Cl. 536—24.31 **3 Claims**

1. An isolated DNA useful in determining predisposition to human hypertension which comprises the DNA sequence of an angiotensinogen gene which codes for methionine at amino acid residue 174.



5,589,585

DNA FRAGMENTS, PROBES AND AMPLIFICATION PRIMERS OF THE 65 KD ANTIGEN OF MYCOBACTERIA

Claude Mabilat, Villeurbanne, France, and Jean-Claude Pechere, Geneva, Switzerland, assignors to Bio Merieux, L'Etoile, France

Filed Aug. 12, 1993, Ser. No. 105,168

Claims priority, application France, Aug. 12, 1992, 92 10094

Int. Cl.[6] C07H *21/04*

U.S. Cl. 536—24.32 **9 Claims**

1. A nucleotide fragment consisting of nucleotides 438 to 751 of a gene coding for a 65-kD mycobacterial antigen or a fully complementary sequence.

5,589,586

NUCLEOSIDES ATTACHED TO A SOLID SUPPORT THROUGH A 3'-SILYL LINKAGE AND THEIR USE IN OLIGONUCLEOTIDE SYNTHESIS

Lars Holmberg, Uppsala, Sweden, assignor to Pharmacia LKB Biotechnology AB, Uppsala, Sweden

PCT No. PCT/SE91/00797, § 371 Date Jul. 24, 1992, § 102(e) Date Jul. 24, 1992, PCT Pub. No. WO92/09615, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 25, 1991, Ser. No. 915,820

Claims priority, application Sweden, Nov. 26, 1990, 9003743

Int. Cl.[6] C07H *21/00*

U.S. Cl. 536—25.3 **9 Claims**

1. A support for the synthesis of oligonucleotides consisting of a solid support having a first nucleoside bound thereto, wherein said first nucleoside is bound to said support via a silylether linkage directly to said first nucleoside, said silylether linkage being stable to synthesis and deprotection reagents and selectively cleavable by a silylether cleaving agent.

6. A method for synthesizing oligonucleotides on a solid support, wherein said solid support has a first nucleoside bound thereto via a silylether linkage directly to said first nucleoside, said silylether linkage being stable to synthesis and deprotection reagents and selectively cleavable by a silylether cleaving agent which comprises:

(i) condensing protected nucleotides onto said first nucleoside thereby forming a desired oligonucleotide in protected form, each condensation of a nucleotide being preceded by an acid catalyzed 5'-deprotection step;

(ii) removing all protecting groups on said protected oligonucleotide except for a 5'-protecting group and cleaving any apurinic sites which may have been formed during acid-catalyzed 5'-deprotection in step (i);

(iii) cleaving said silylether linkage by a silylether cleaving agent to remove said oligonucleotide from said support; and

(iv) purifying said oligonucleotide by reverse phase chromatography, using said 5'-protecting group as an affinity handle.

5,589,587

PROCESS FOR THE PREPARATION OF RIBONUCLEOTIDE REDUCTASE INHIBITORS

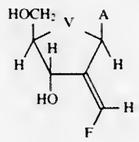
James R. McCarthy; Donald P. Matthews, both of West Chester; Jeffrey S. Sabol, Loveland, all of Ohio; James R. McConnell; Richard E. Donaldson, both of Midland, Mich., and Robert Duquid, Richmond, Va., assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 178,952, Jan. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 31,012, Mar. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 881,978, May 12, 1992, abandoned. This application Apr. 10, 1995, Ser. No. 419,315

Int. Cl.[6] C07H *1/00*

U.S. Cl. 536—28.5 **3 Claims**

1. A process for stereoselectively preparing a compound of the formula

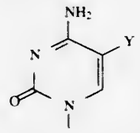


wherein

V is oxy or methylene;

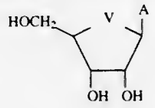
the exocyclic vinylfluoride is in the (E) configuration; and

A is of the formula

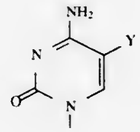


wherein Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, comprising the steps of:

(a) reacting a compound of the formula



wherein A



and Y are defined as above, with excess 1,3-dichloro-1,1,3,3-tetraalkyldisiloxane and triethylamine followed by treatment with SO_3-pyridine complex to produce a 3',5'-protected-2'-keto derivative;

(b) reacting the 3',5'-protected-2'-keto derivative with a phosphonate ylid of the formula $(X)_2OP{=}CF(SO_2Ar)$ wherein the ylid is prepared from potassium tert-butoxide; Ar is an aryl group and X is a phenoxy or C_1–C_4 alkoxy to produce an exocyclic fluorovinyl sulfone in the (Z) configuration;

(c) reacting the (Z)-exocyclic fluorovinyl sulfone with a stannylating reagent of the formula $(R)_3SnH$ wherein R is aryl or C_1–C_4 alkyl to produce an exocyclic (fluorovinyl)stannane in the (Z)-configuration;

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(d) reacting the (Z)-exocyclic (fluorovinyl)stannane with a protolysis agent and, either concomitantly or sequentially, reacting the silyl protecting group with a suitable acid or a fluoride ion source.

5,589,588

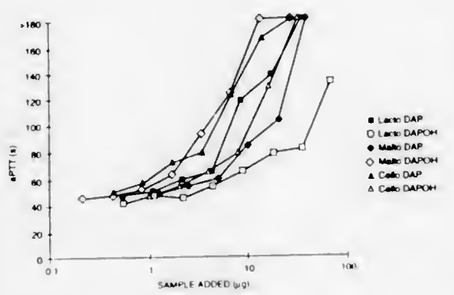
SULFATED ACID AMIDES HAVING ANTICOAGULANT PROPERTIES

Joseph A. Toce, Webster Groves, Mo., assignor to Reliable Biopharmaceutical Corporation, St. Louis, Mo.

Filed Mar. 30, 1993, Ser. No. 40,112

Int. Cl.[6] A61K *31/735*

U.S. Cl. 536—53 **2 Claims**



1. A sulfated acid amide of the formula:

$$(R_1)—NH—R—NH—(R_1)$$

wherein

R_1 is selected from the group consisting of sulfated maltose, sulfated maltotriose and sulfated maltotetrose acids or mixtures thereof, and

R is a hydrocarbon chain of 3 carbons, and is substituted with one hydroxyl in the 2-position.

5,589,589

PROCESS FOR SCREENING CELLULOSE ETHERS

Manfred Sponheimer, Wiesbaden; Guenther Welt, Gau-Bischofsheim, and Manfred Ziegelmayer, Bischofsheim, all of Germany, assignors to Hoechst AG, Germany

Filed Apr. 11, 1995, Ser. No. 420,070

Claims priority, application Germany, Apr. 11, 1994, 44 12 391.4

Int. Cl.[6] C08B *11/20; 11/08*

U.S. Cl. 536—86 **16 Claims**

1. A process for recovering finely divided cellulose ether particles from a particulate cellulose ether containing elongated or fibrous particles thereof cellulose ether having a finely fibrous or wad-like or woolly structure, comprising the following steps:

a) applying a said particulate cellulose ether to a sieve surface of a sieving system,

b) agitating the sieve surface and dividing said particulate cellulose ether into a first, finely divided fraction capable of passing through the sieve and a second, oversize fraction which remains on the sieve surface,

c) during said step b, flushing said agitated sieve surface with an air flow, generally perpendicular to the sieve surface, which air flow is applied from below the sieve surface,

d) discharging the second, oversize fraction from the sieving system, and

e) discharging or recovering the first, finely divided fraction.

5,589,590

PROCESS FOR THE PREPARATION OF CYCLODEXTRINS OR OTHER COMPOUNDS CAPABLE OF PRODUCING CLATHRATES WITH A GAS

Henry Ledon, Versailles; Pierre Larnicol, Chalon-sur-Saone; Marie-Jeanne Desmurs, Saint Gengoux le National, and Michel Dupont, Chagny, all of France, assignors to Chemoxal, Paris, France

Continuation of Ser. No. 887,046, May 22, 1992, abandoned. This application Jan. 25, 1994, Ser. No. 186,238

Claims priority, application France, May 27, 1991, 91 06325

Int. Cl.[6] C08B *37/16;* **C07B** *63/00*

U.S. Cl. 536—127 **32 Claims**

1. A process for purification of a first substance, said first substance being a cyclodextrin capable of forming a clathrate with a gas from a mixture comprising said first substance and other components, said process comprising the following steps:

contacting said mixture with at least one non-toxic and non-flammable gas, in the absence of substantially any substance, other than said at least one gas, that forms a clathrate with said first substance that will precipitate from said mixture, until a precipitate of clathrates is formed comprised of said first substance and the at least one gas;

separating said precipitate of clathrates from said other components remaining in said mixture;

and recovering said first substance with no content of said other substance.

5,589,591

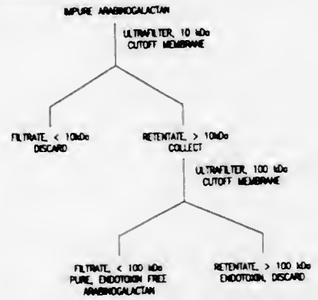
ENDOTOXIN-FREE POLYSACCHARIDES

Jerome M. Lewis, Newton, Mass., assignor to Advanced Magnetics, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 260,551, Jun. 16, 1994, Pat. No. 5,554,386, which is a continuation-in-part of Ser. No. 936,873, Aug. 27, 1992, Pat. No. 5,336,506, which is a continuation-in-part of Ser. No. 900,686, Jun. 17, 1992, Pat. No. 5,478,576, which is a continuation of Ser. No. 630,017, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 679,526, Apr. 2, 1991, Pat. No. 5,141,739, which is a continuation of Ser. No. 384,991, Jul. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,640, Aug. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 67,586, Jun. 26, 1987, Pat. No. 4,827,945, which is a continuation-in-part of Ser. No. 882,044, Jul. 3, 1986, Pat. No. 4,770,183. This application Nov. 29, 1994, Ser. No. 346,142

Int. Cl.[6] C07H *1/00;* **C08B** *37/00*

U.S. Cl. 536—128 **8 Claims**



1. A method of making a highly purified, substantially endotoxin-free arabinogalactan composition which comprises the steps of:

(i) removing from an arabinogalactan-containing preparation by ultrafiltration, materials of a molecular weight that are less than the molecular weight of the arabinogalactan composition, and collecting the arabinogalactan-containing fraction thereof;

(ii) thereafter removing from the arabinogalactan-containing fraction by ultrafiltration, endotoxin and materials of a molecular weight that are greater than the molecular weight of the arabinogalactan; and

(iii) collecting the resulting arabinogalactan-containing fraction, which has been rendered substantially endotoxin-free.

5,589,592

PROCESS FOR PREPARING β-LACTAM DERIVATIVE AND SYNTHETIC INTERMEDIATE

Hiroshi Horikawa, Kawanishi, and Kazuhiko Kondo, Osaka, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

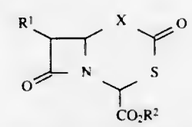
Division of Ser. No. 18,407, Feb. 17, 1993, Pat. No. 5,414,081. This application Apr. 7, 1995, Ser. No. 393,395

Claims priority, application Japan, Jun. 3, 1992, 4-99023

Int. Cl.[6] C07D *503/04*

U.S. Cl. 540—204 **11 Claims**

1. A 1-aza-3-thia-bicycloalkane compound represented by the formula:



(II)

wherein R^1 represents a hydroxy-substituted lower alkyl group which may be protected or an amino group which may be protected; R^2 represents hydrogen atom or an ester residue; X represents a methylene, a methylene group substituted by a lower alkyl group, sulfur atom or a group represented by the formula: $—A—CH_2—$ where A represents sulfur atom, oxygen atom or methylene group;

or a salt thereof.

5,589,593

CRYSTALLINE FORM OF A CEPHALOSPORIN ANTIBIOTIC

Marco Da Col, Bologna; Leone Dall'Asta, Pavia, and Irene Resta, Milan, all of Italy, assignors to Biochimica Opos SpA, Agrate Brianza, Italy

Division of Ser. No. 455,136, May 31, 1995, which is a continuation of Ser. No. 235,262, Apr. 29, 1994, abandoned, which is a continuation of Ser. No. 973,457, Nov. 9, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,888

Claims priority, application Italy, Nov. 11, 1991, MI91A2995

Int. Cl.[6] C07D *501/32*

U.S. Cl. 540—220 **3 Claims**

1. A process for the preparation of crystalline cefaclor and for its conversion to cefaclor monohydrate, which comprises

(i) treating raw cefaclor with a mineral or organic acid in a from about 4/1 (v/v) to about 1/4 (v/v) mixture of water and a substantially water-miscible alcohol until a complete solution is obtained, adjusting the pH of the solution to about 4.5, bringing the temperature of the solution to 0°–5° C. and isolating the crystalline cefaclor thus obtained; then

(ii) acidifying an aqueous suspension of said crystalline cefaclor until a complete solution is obtained, adjusting the pH to about 4.5 and isolating the cefaclor monohydrate thus obtained.

5,589,594

PROCESS FOR THE PREPARATION OF CEPHEM PRODRUG ESTERS

Elisabeth Defossa, Idstein; Gerd Fischer, Limburg; Uwe Gerlach, Frankfurt am Main; Rolf Hörlein, Frankfurt am Main; Norbert Krass, Frankfurt am Main; Rudolf Lattrell, Königstein/Taunus; Ulrich Stache, Hofheim am Taunus, and Theodor Wollmann, Hofheim am Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

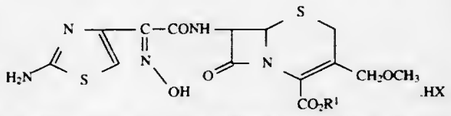
Continuation of Ser. No. 16,562, Feb. 11, 1993, abandoned. This application Dec. 30, 1993, Ser. No. 176,501

Claims priority, application Germany, Feb. 14, 1992, 42 04 349.2

Int. Cl.[6] C07D *501/02*

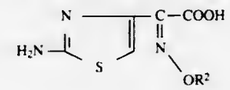
U.S. Cl. 540—228 **5 Claims**

1. A process for the preparation of a compound of the formula I



I

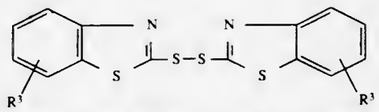
in which R^1 is C_1–C_5-alkanoyloxy-C_1–C_3-alkyl or C_1–C_5-alkoxycarbonyloxy-C_1–C_3-alkyl and X is an inorganic or organic anion, and in which the hydroxyimino group is present in the syn-form, which comprises allowing a compound of the formula II



II

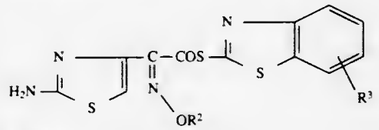
in which

R^2 is a protective group which can be removed by acid hydrolysis, to react with a bis(benzothiazol-2-yl) disulfide of the formula VI



VI

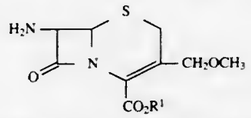
in which R^3 is hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_3–C_6-alkynyl, C_1–C_6-alkyloxy, C_2–C_6-alkenyloxy, C_3–C_6-alkynyloxy, hydroxyl, acetoxy, halogen, nitro, amino, carboxyl or the sulfo group, and triphenylphosphine in an inert solvent, in the presence of a tertiary amine, to give a compound of the formula V



V

in which

R^2 and R^3 have the abovementioned meanings, then reacting the compound of formula V with a 7-aminoceph-3-em-4-carboxylic acid ester of the formula III



III

in which R^1 has the abovementioned meaning, in inert organic or dipolar aprotic solvents at temperatures between 0° and +80° C. and treating the resulting oxime-protected compound of the formula IV

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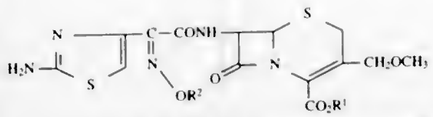


IV

in which R^1 and R^2 have the abovementioned meanings and in which the protected oxime group is present in the syn-form, with inorganic acids or with aliphatic or aromatic sulfonic acids in organic solvents at temperatures between +20° and +110° C. whereby the protective group R^2 is removed and a salt is formed in one step to form the compound of the formula I.

5,589,595

PROCESS FOR TETRAAZACYCLOALKANE PREPARATION

Rolf W. Sandnes; Kjell Undhelm; Michel Gacek, all of Oslo, Norway, and Janis Vasilevskis, Wayne, Pa., assignors to Nycomed Imaging AS, Oslo, Norway

Filed Jun. 7, 1995, Ser. No. 483,189

Claims priority, application United Kingdom, Mar. 10, 1995, 9504922

Int. Cl.[6] C07D *257/02;* **A61K** *49/00*

U.S. Cl. 540—474 **27 Claims**

1. A process for the preparation of macrocyclic tetraazacycloalkanes, said process comprising (i) reacting a tetraazaalkane with a bridging agent to couple four amine nitrogens of said tetraazaalkane to a bridging moiety to yield a fused tricyclic intermediate, (ii) reacting said intermediate to introduce an alkylene bridge between the secondary amine nitrogens in the outer rings of the fused tricyclic intermediate, optionally by decoupling an alkanediylidene bridging moiety from the tertiary amine nitrogens at the ring fusion sites of the fused tricyclic intermediate, and (iii) where necessary, decoupling said bridging moiety to yield a macrocyclic tetraazacycloalkane.

5,589,596

PROCESS FOR PRODUCING AMINES

Atsushi Furutani, Nishinomiya; Takuo Hibi, Toyonaka; Michio Yamamoto, Otsu; Kazuyuki Tanaka, Ibaraki; Kazuhiro Tada, Kyoto; Masami Fukao, Kurita-gun, and Gohfu Suzukamo, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 8, 1994, Ser. No. 194,328

Claims priority, application Japan, Apr. 27, 1993, 5-101074; Jul. 21, 1993, 5-180248; Jul. 21, 1993, 5-180249; Aug. 6, 1993, 5-196041; Aug. 9, 1993, 5-197339

Int. Cl.[6] C07C *209/22*

U.S. Cl. 564—446 **32 Claims**

1. A process for producing an amine by carrying out a reductive amination of a cyclic ketone or by carrying out a reduction of an imino derivative of a cyclic ketone to the corresponding amine which comprises carrying out the reductive amination or reduction in the presence of a cobalt catalyst containing a carbonate of an alkaline earth metal and/or lanthanum oxide on which cobalt is supported.

5,589,597

PROCESS OF PRODUCING ETHER COMPOUND

Tatsuya Egawa; Yasuhiro Kawaguchi; Kenji Mogami, and Nobuaki Shimizu, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

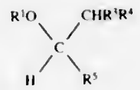
Division of Ser. No. 355,180, Dec. 8, 1994, Pat. No. 5,523,491, which is a division of Ser. No. 66,238, May 25, 1993, Pat. No. 5,399,631. This application Dec. 14, 1995, Ser. No. 572,642

Claims priority, application Japan, Jun. 4, 1992, 4-143922; Sep. 7, 1992, 4-237842

Int. Cl.[6] C07C *43/03;43/11;43/184;43/205*

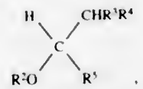
U.S. Cl. 568—608 **3 Claims**

1. A method of production of an ether compound expressed by the formula (II):



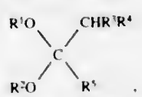
(II)

or by the formula (III):



(III)

wherein R^1 and R^2 are a hydrocarbon group or a hydrocarbon group containing ether oxygens in the main chain, in the side chain or in the both of them, respectively, and may be the same or different from each other and R^3, R^4 and R^5 are a hydrogen atom, a hydrocarbon group or a hydrocarbon group containing either oxygens in the main chain, in the side chain or in the both of them, respectively, and may be the same or different from each other, which comprises bringing an acetal compound or a ketal compound, expressed by the formula (I):



(I)

wherein R^1, R^2, R^3, R^4 and R^5 are the same as those in the formulae (II) and (III), into the reaction at a temperature of 10°–250° C. with hydrogen at a pressure of 1°–200 kg/cm^2 in the presence of a solid acid catalyst having hydrogenating ability.

5,589,598

PROCESS OF PURIFICATION OF 2,6-DIISOPROPYLPHENOL

Maurizio Paiocchi, Milan, Italy, assignor to Zambon Group S.p.A., Vicenza, Italy

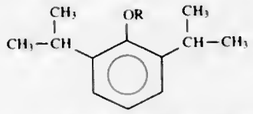
Filed Jun. 1, 1995, Ser. No. 457,592

Claims priority, application Italy, Sep. 28, 1994, MI94A1969

Int. Cl.[6] C07C *37/68*

U.S. Cl. 568—756 **10 Claims**

1. A process for the purification of Propofol comprising the transformation of the crude Propofol into an ester solid at room temperature of formula



(I)

wherein R is a residue of a carboxylic or sulphonic acid, the crystallization of the ester (I) in order to obtain a purity degree equal to or higher than 99.9% and its subsequent hydrolysis.

5,589,599

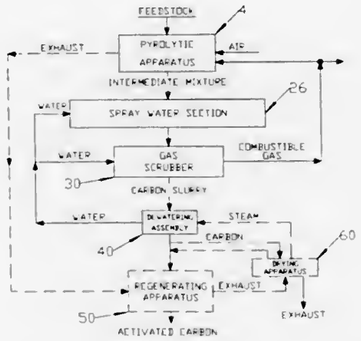
PYROLYTIC CONVERSION OF ORGANIC FEEDSTOCK AND WASTE

Frederick G. McMullen, P.O. Box 396, Gwynedd Valley, Pa. 19437; Dillon G. McMullen, N6640 County Hwy. H, and Roger B. McMullen, N5238 Hwy. 51, both of Irma, Wis. 54442

Filed Jun. 7, 1994, Ser. No. 255,326

Int. Cl.[6] C02F *11/10*

U.S. Cl. 585—240 **5 Claims**



1. A process for producing usable gaseous fuel and a carbonaceous an solid from a substantially organic feedstream such as municipal wastes comprising:

subjecting the feedstream to flash pyrolysis at a temperature of from about 700° to about 2400° F. to form intermediate solid and gas products;

subjecting the intermediate products to a series of water sprays thereby creating a superheated steam with at least the first of said water sprays and later water sprays cooling and condensing the products, scrubbing and contracting the gases, and forming a slurry with the solid product;

separating the gas from the slurry;

scrubbing and drying the gas to remove selected compounds;

draining the water from the solid in the slurry; and

drying the solid.

5,589,600

PREPARATION OF CYCLOHEXENE BY PARTIAL HYDROGENATION OF BENZENE

Rolf Fischer, Heidelberg; Roman Dostalek, Roemersberg, and Laszlo Marosi, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 233,716, Apr. 26, 1994, abandoned, which is a continuation of Ser. No. 14,409, Feb. 5, 1993, abandoned. This application May 25, 1995, Ser. No. 450,981

Claims priority, application Germany, Feb. 5, 1992, 42 03 220.2

Int. Cl.[6] C07C *5/10;5/11*

U.S. Cl. 585—266 **9 Claims**

1. A process for the preparation of cyclohexene by the partial hydrogenation of benzene with hydrogen which comprises: carrying out the partial hydrogenation reaction at elevated temperatures of from about 20° to about 300° C. in an aqueous and liquid phase in the presence of a ruthenium/nickel alloy catalyst having a space lattice constant for the a-axis of from 0.2610 to 0.2705 nm and for the c-axis of from 0.4200 to 0.4280 nm, wherein the aqueous phase contains one or more dissolved cations of Group II to VIII transition metals of the periodic table as promoters.

5,589,601

PROCESS FOR THE DIMERIZATION, CO-DIMERIZATION AND OLIGOMERIZATION OF OLEFINS

Yves Chauvin, Le Pecq, and Hélène Olivier, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, France

Filed Sep. 15, 1995, Ser. No. 528,519

Claims priority, application France, Sep. 16, 1994, 94 11153

Int. Cl.[6] C07C *2/02;2/04;2/24*

U.S. Cl. 585—513 **15 Claims**

1. A process for the dimerization, co-dimerizgation or oligomerization of olefins, comprising contacting said olefins under effective conditions with a catalytic composition which results from mixing at least one tungsten oxyhalide, at least one aryl isocyanate and/or diisocyanate, and at least one alkylaluminum halide.

5,589,602

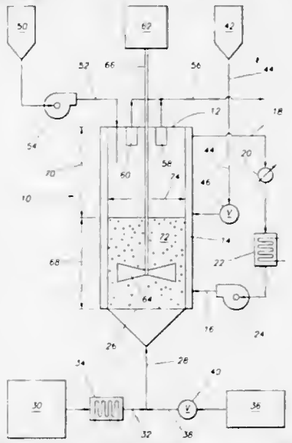
METHOD OF PREPARING ISOMERIZATION CATALYST

Robert S. Smith, 1018 Buoy, Houston, Tex. 77062, and Steven L. McMahon, 848 Amy Lea, Sevierville, Tenn. 37862

Division of Ser. No. 150,950, Nov. 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,153

Int. Cl.[6] C07C *5/27;* **B01J** *23/04*

U.S. Cl. 585—671 **20 Claims**



1. A method of isomerizing 5-vinyl-2-norbornene (VNB) to 5-ethylidene-2-norbornene comprising contacting VNB with an isomerization catalyst at a temperature of 0° to 80° C. and a contact time in the range of 1 to 12 hours wherein said isomerization catalyst is prepared by:

(a) introducing alumina particles having a particle diameter in the range of 10 to 500 microns into a vertical fluidization zone,

(b) introducing an upward flow of fluidizing nitrogen gas to said fluidization zone at a rate sufficient to suspend said alumina in a fluidized bed maintained in said fluidization zone,

(c) maintaining the temperature in the fluidization zone at a premixing temperature in the range of 150° to 400° C. to dry said alumina, and thereafter,

(d) introducing an amount of sodium, wherein said amount of sodium is within the range of 1:20 to 1:5 based upon the weight of alumina particles, into said fluidization zone at a rate of 0.01 to 0.45 lb sodium/hr per lb alumina while maintaining the temperature in the fluidization zone within the range of 100° to 200° C.,

(e) maintaining said flow of fluidizing gas for a mixing period of at least 30 minutes after said amount of sodium has been introduced to said fluidization zone to disperse said sodium on said alumina to form an isomerization catalyst, and thereafter,

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(f) introducing an amount of oxygen to said fluidization zone at a rate in the range of 0.01 to 1 moles/hr per mole of sodium wherein said amount of oxygen is within the range of 0.001:1 to 0.2:1 based on the moles of oxygen introduced to said fluidization zone to the moles of said amount of sodium to form an isomerization catalyst, and

(g) withdrawing said isomerization catalyst from said fluidization zone.

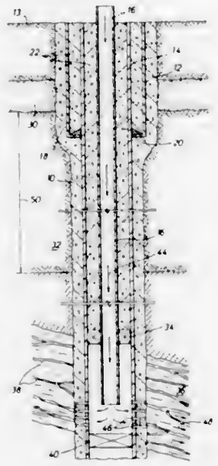
2. The method of isomerizing an olefin which comprises contacting a stream comprising the olefin with an activated catalyst, wherein the activated catalyst is prepared by a method comprising introducing an amount of alkali metal into a fluidized bed of support particles wherein said fluidized bed of support particles is maintained at a temperature above the melting point of the alkali metal and in a fluidized bed state for a time sufficient to evenly disperse the alkali metal on the support particles without substantial breakdown of the support particles, wherein said fluidized bed of support particles is maintained in a fluidized state utilizing a fluidizing gas flowing at a superficial velocity of from 2 to 20 linear feet per minute, and wherein the diameter of the support particles is in the range from 10 to 500 microns.

5,589,603

METHOD AND APPARATUS FOR THE INJECTION DISPOSAL OF SOLID AND LIQUID WASTE MATERIALS FROM THE DRILLING AND PRODUCTION OF OIL AND GAS WELLS

Albert H. D. Alexander, Laurel, Miss.; W. Thomas Ballatine, Mandeville, La.; Leland D. Lakey, Sandeville, La., and Frank L. Lyon, Mandeville, La., assignors to Newpark Resources, Inc., Metairie, La.

Filed Aug. 22, 1994, Ser. No. 294,250
Int. Cl.[6] A62D *3/00*
U.S. Cl. 588—250 **35 Claims**



1. A method for disposing solid material in a subterranean injection formation comprising:

(a) mixing at the surface of the earth said solid material, liquid and viscosifier thereby forming a slurry;

(b) penetrating a subterranean injection formation with a borehole;

(c) selecting said subterranean injection formation such that:

(i) the porosity and permeability of said subterranean injection formation is such that said slurry can be either flowed through said borehole and into said injection formation by means of the force of gravity or pumped through said borehole and into said injection formation at a low surface injection pressure, and

(ii) said injection formation is below underground sources of drinking water; and

(d) transferring said slurry from the surface of the earth through said borehole into said injection formation.

5,589,604

EXPRESSION OF HUMAN PROTEIN C IN MAMMARY TISSUE OF TRANSGENIC MAMMALS

William N. Drohan, Springfield; Tracy D. Wilkins, Blacksburg; William H. Velander, Blacksburg, and John L. Johnson, Blacksburg, all of Va., assignors to American Red Cross, Washington, D.C., and Virginia Intellectual Property Division, Blacksburg, Va.

Continuation of Ser. No. 638,995, Jan. 11, 1991, abandoned. This application May 23, 1994, Ser. No. 247,484
Int. Cl.[6] C12N *5/00;15/00;9/48;* **C12P** *21/04*
U.S. Cl. 800—2 **20 Claims**

1. A transgenic non-human mammal that contains and expresses a human protein C DNA construct in the cells of its mammary gland, wherein the DNA construct consists of:

(a) a mammary gland promoter,

(b) a nucleotide sequence that encodes a signal peptide, wherein said signal peptide is effective in directing the secretion of an associated polypeptide into the milk of said transgenic non-human mammal, and wherein said signal peptide-encoding nucleotide sequence is operatively associated with said mammary gland promoter, and

(c) a nucleotide sequence encoding human protein C that is operatively associated with said signal peptide-encoding nucleotide sequence,

wherein human protein C is secreted into the milk of said transgenic non-human mammal, and when purified, said protein C has a specific activity more than about 80% of the specific activity of human protein C isolated from human plasma, as determined by an assay of protein C serine protease activity or anticoagulant activity, and

wherein said non-human mammal is selected from the group consisting of mouse, pig, sheep, goat and cattle.

5,589,605

HYBRID CORN WITH A GENETIC COMPLEMENT PRODUCING INCREASED YIELD, SEEDLING VIGOR, EARLY STAND, STALK STRENGTH AND LOW HARVEST MOISTURE

Marvin F. Lindsey, Boone, Iowa, assignor to DeKalb Genetics Corporation, DeKalb, Ill.

Continuation of Ser. No. 463,848, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 187,188, Apr. 28, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,460
Int. Cl.[6] A01H *5/00;1/00*
U.S. Cl. 800—200 **2 Claims**

1. F_1 generation hybrid corn plant EXP 748, wherein a sample of seed of EXP 748 has been deposited under ATCC accession No. 40470.

5,589,606

INBRED CORN LINE ZS1679

Michael R. Buendgen, Madison, Wis., and Bernard J. Hable, Ankeny, Iowa, assignors to Zenco (No. 4) Limited, London, England

Filed Mar. 28, 1995, Ser. No. 413,872
Int. Cl.[6] A01H *1/02;4/00;5/00;* **C12N** *5/04*
U.S. Cl. 800—200 **11 Claims**

1. Inbred corn seed designated ZS1679 seed of which has been deposited in the ATCC under deposit number X.

2. A corn plant produced by the seed of claim 1.

5,589,607

Patent Not Issued For This Number

5,589,608

Patent Not Issued For This Number

5,589,609

Patent Not Issued For This Number

5,589,610

STAMEN-SPECIFIC PROMOTERS FROM CORN

Marc De Beuckeleer; Lydia Herdies; Véronique Gossele, all of Gent, Belgium, and Celestina Mariani, Nijmegen, Netherlands, assignors to Plant Genetic Systems, N.V., Belgium

PCT No. PCT/EP92/00275, § 371 Date Oct. 4, 1993, § 102(e) Date Oct. 4, 1993, PCT Pub. No. WO92/13957, PCT Pub. Date Aug. 20, 1992
PCT Filed Feb. 5, 1992, Ser. No. 104,073
Claims priority, application European Pat. Off., Feb. 7, 1991, 91400300; Jun. 28, 1991, 91401787
Int. Cl.[6] A01H *1/00;5/00;5/10;* **C12N** *15/10;15/29*
U.S. Cl. 800—205 **37 Claims**

9. A stamen-specific promoter region, wherein said promoter region is contained within the sequence of nucleotides 1 to 1179 of SEQ ID No. 3.

19. A plant cell containing stably integrated in its genome a foreign DNA comprising the promoter region of claim 9 operably linked to a heterologous structural gene.

24. A plant or seed containing stably integrated in the genome of its cells a foreign DNA comprising the promoter region of claim 9 operably linked to a heterologous structural gene.

5,589,611

DISEASE RESISTANCE GENE FROM MAIZE AND ITS USE FOR DISEASE RESISTANCE AS A SELECTABLE MARKER AND AS A GENE IDENTIFICATION PROBE

Steven P. Briggs, Des Moines, and Gurmukh S. Johal, Urbandale, both of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 995,658, Dec. 15, 1992, abandoned. This application Sep. 17, 1993, Ser. No. 123,761
Int. Cl.[6] A01H *1/04;* **C12N** *5/00;15/00;* **C07H** *21/04*
U.S. Cl. 800—205 **11 Claims**

9. A method of imparting resistance to diseases caused by *C. carbonum* to plants of a susceptible taxon, comprising the steps of:

a) culturing cells or tissues from at least one plant from the taxon,

b) introducing into the cells or tissue culture at least one copy of an expression cassette comprising the Hm1 gene operably linked to plant regulatory sequences which cause the expression of the gene in the cells, and

c) regenerating disease-resistant whole plants from the cell or tissue culture.

5,589,612

VIRUS RESISTANT PLANTS TRANSFORMED WITH A PVY PROTEASE GENE

Joseph M. Jilka, Ankeny, Iowa, and Nilgun E. Tumer, Chesterfield, Mo., assignors to Monsanto Company

Continuation of Ser. No. 910,792, Jul. 9, 1992, abandoned. This application Nov. 4, 1993, Ser. No. 148,022
Int. Cl.[6] C12N *15/40;5/14;15/82;* **A01H** *5/00*
U.S. Cl. 800—205 **13 Claims**

10. A virus resistant transformed potato plant which contains a PVY protease gene, wherein said protease gene is derived from a PVY which is capable of infecting said plant and wherein said protease gene is stably incorporated into the genome of said plant and is expressed at a level sufficient to render the plant resistant to PVY.

5,589,613

CARNATION PLANTS AND METHODS FOR THEIR TRANSFORMATION AND PROPAGATION

Ebrahim Firoozabady, Pleasant Hill, Calif.; Christine Lemieux, Boulder, Colo.; Benjamin A. Moll, Berkeley, and Karol Robinson, Moraga, both of Calif., assignors to Florigene Europe B.V., Rijnsburg, Netherlands

Continuation of Ser. No. 678,915, Apr. 1, 1991, abandoned. This application Nov. 10, 1993, Ser. No. 150,528
Int. Cl.[6] A01H *4/00*
U.S. Cl. 800—205 **41 Claims**

1. A method for genetically transforming carnation plant material, said method comprising:

cocultivating carnation plant material with *Agrobacterium tumefaciens* or *rhizogenes* cells carrying an exogenous DNA sequence;

initiating callus formation in the plant material; and

selecting transformed plant cells.

5,589,614

PLANT-DERIVED GLUTATHIONE-S-TRANSFERASE ISOFORM II PROMOTER

Ian G. Bridges, Silchester; Simon W. J. Bright, Marlow; Andrew J. Greenland, Maidenhead; David C. Holt, Wokingham; Ian Jepson, Slough, and Wolfgang W. Schuch, Crowthorne, all of England, assignors to Zeneca Limited, London, England

PCT No. PCT/GB92/01187, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO93/01294, PCT Pub. Date Jan. 21, 1993
PCT Filed Jul. 1, 1992, Ser. No. 170,294
Claims priority, application United Kingdom, Jul. 2, 1991, 9114259
Int. Cl.[6] A01H *4/00;* **C12N** *15/82*
U.S. Cl. 800—205 **7 Claims**

1. A genomic DNA sequence encoding the gene promoter for the 27 kD subunit of glutathione-S-transferase, isoform II, containing the nucleotide sequence shown in FIG. 8 herewith.

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5,589,615

PROCESS FOR THE PRODUCTION OF TRANSGENIC PLANTS WITH INCREASED NUTRITIONAL VALUE VIA THE EXPRESSION OF MODIFIED 2S STORAGE ALBUMINS

Ann De Clercq, Harelbeke, Belgium; Enno Krebbers, Alhambra, Calif.; Joël Vandekerckhove, Loppem, Belgium; Luiz Barreto De Castro; Eugen Gander, both of Brasileia, Brazil, and Marc Van Montagu, Brussels, Belgium, assignors to Plant Genetic Systems N.V., Ghent, Belgium, and Brazilian Agricultural Research Organization-Embrapa/Cenargen, Brasileia, Brazil

Continuation of Ser. No. 47,538, Apr. 19, 1993, abandoned, which is a continuation of Ser. No. 499,386, Aug. 9, 1990, abandoned. This application Apr. 18, 1994, Ser. No. 229,069

Claims priority, application United Kingdom, Oct. 18, 1988, 88402611; Oct. 20, 1988, 88402650

Int. Cl.[6] A01H *4/00*

U.S. Cl. 800—205 **19 Claims**

1. A seed-forming plant susceptible to Agrobacterium transformation; the genome of said plant comprising a recombinant DNA encoding a precursor of a modified 2S albumin, under the control of a promoter, said recombinant DNA comprising:

a nucleic acid sequence encoding a precursor of a 2S albumin from Brassica species, an Arabidopsis species, *Ricinus communis* or *Bertholletia excelsa*, wherein a second DNA sequence is inserted into or replaces in part a region of said nucleic acid sequence between (i) a third codon downstream of a codon encoding a fourth cysteine residue and (ii) a third codon upstream of a codon encoding a fifth cysteine residue of the large subunit of said 2S albumin and wherein said second DNA sequence encodes a polypeptide containing an amino acid selected from the group consisting of a lysine, a methionine, a tryptophan, a threonine, a phenylalanine, a leucine, a valine, an arginine and an isoleucine; and whereby said precursor of said modified 2S albumin is expressed and said modified 2S albumin or said precursor of said modified 2S albumin is stored in said plant.

5,589,616

MONOCOT SEED STORAGE PROTEINS IN DICOTS

Leslie M. Hoffman, Madison, Wis., assignor to Mycogen Plant Science, Inc., San Diego, Calif.

Continuation of Ser. No. 982,869, Nov. 30, 1992, abandoned, which is a division of Ser. No. 393,834, Aug. 14, 1989, Pat. No. 5,215,912, which is a continuation of Ser. No. 902,224, Aug. 29, 1986, abandoned. This application Jul. 25, 1994, Ser. No. 279,616

Int. Cl.[6] C12N *5/14;15/29;* **A01H** *5/00;5/10*

U.S. Cl. 800—205 **64 Claims**

1. A dicot cell containing a monocot seed storage protein.

7. A plant material descended from the cell of claim 1, in which said monocot seed storage protein is detectably expressed.

5,589,617

ENHANCED REGENERATION SYSTEM

Narender S. Nehra; Kutty K. Kartha, and Ravindra N. Chibbar, all of Saskatoon, Canada, assignors to National Research Council of Canada, Saskatoon, Canada

Continuation of Ser. No. 29,652, Mar. 11, 1993, abandoned. This application Aug. 3, 1994, Ser. No. 284,296

Int. Cl.[6] A01H *1/00;4/00;* **C12N** *5/04;5/10;15/00;15/09*

U.S. Cl. 800—205 **21 Claims**

1. In a method of regenerating wheat or barley plants from harvested immature plant embryos, the improvement comprising isolating scutellar tissue from said embryos in such a manner that substantially all of the embryo axis is removed and the scutellum is essentially undamaged by the removal of the embryo axis, and culturing the isolated scutellar tissue in vitro under conditions conducive to the regeneration of a wheat or barley plant by somatic embryogenesis, wherein said scutellar tissue is capable of producing predominantly embryogenic callus.

16. An isolated scutellum of a wheat or barley plant, from which substantially all of the embryo axis is removed, and which is essentially undamaged by the removal of the embryo axis, at least some of whose cells are transformed with foreign DNA.

5,589,618

MATERIALS AND METHODS FOR INCREASING CORN SEED WEIGHT

L. Curtis Hannah, Gainesville, Fla., and Michael Giroux, Pullman, Wash., assignors to University of Florida, Gainesville, Fla.

Filed Sep. 1, 1994, Ser. No. 299,675

Int. Cl.[6] A01H *4/00;* **C12N** *15/05*

U.S. Cl. 800—205 **10 Claims**

1. A polynucleotide molecule, comprising a variant of the wild type shrunken-2 (Sh2) gene, wherein said variant codes for the insertion of at least one additional amino acid within the allosteric binding site of the ADP-glucose pyrophosphorylase (AGP) enzyme subunit, whereby a plant expressing said polynucleotide molecule has increased seed weight relative to the seed weight of a plant expressing the wild type Sh2 gene.

8. A plant expressing the polynucleotide molecule of claim 1.

5,589,619

PROCESS AND COMPOSITION FOR INCREASING SQUALENE AND STEROL ACCUMULATION IN HIGHER PLANTS

Joseph Chappell, Lexington, Ky.; Court A. Saunders, Clarendon Hills, and Fred R. Wolf, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 934,374, Aug. 14, 1992, Pat. No. 5,349,126, which is a continuation-in-part of Ser. No. 596,467, Oct. 12, 1990, Pat. No. 5,306,862. This application Dec. 8, 1994, Ser. No. 308,551

Int. Cl.[6] A01H *5/00;* **C12N** *15/00;15/82*

U.S. Cl. 800—205 **7 Claims**

1. A process of increasing squalene accumulation in a transgenic plant comprising:

(a) transforming a plant cell with a recombinant DNA molecule comprising a vector operatively linked to a DNA segment that encodes a polypeptide having HMG-CoA reductase activity, and a promoter suitable for driving the expression of said polypeptide in said plant cell to form a transformed plant cell; and

(b) regenerating said transformed plant cell into said transgenic plant.

6. A transgenic plant produced in accordance with the process of claim 1.

5,589,620

BIBENZYL SYNTHASE GENES

Helmut Kindl, Marburg; Rüdiger Hain, Langenfeld, and Hans-Jörg Reif, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 11, 1994, Ser. No. 321,358

Claims priority, application Germany, Oct. 13, 1993, 43 34 791.6

Int. Cl.[6] A01H *5/00;5/10;* **C12N** *15/29;15/82*

U.S. Cl. 800—205 **25 Claims**

1. An isolated and purified DNA sequence comprising a nucleotide sequence that encodes a bibenzyl synthase isolatable from an orchid.

11. Transgenic whole plants comprising a DNA sequence according to claim 1 as foreign DNA or additional DNA.

5,589,621

PINOSYLVINE SYNTHASE GENES

Helmut Kindl, Marburg; Rüdiger Hain, Langenfeld; Hans-Jörg Reif, Cologne; Klaus Stenzel, Duesseldorf, and Jürgen Thomzik, Langenfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 941,469, Sep. 8, 1992, Pat. No. 5,391,724. This application Nov. 14, 1994, Ser. No. 338,996

Claims priority, application Germany, Sep. 18, 1991, 41 30 986.3

Int. Cl.[6] A01H *4/00;* **C12N** *5/14*

U.S. Cl. 800—205 **3 Claims**

3. A transformed whole plant containing within its genome a nucleotide sequence selected from the group consisting of (i) the nucleotide sequence of the cDNA contained in plasmid pin 5-49, (ii) the nucleotide sequence of the cDNA sequence of SEQ ID No: 1 and (iii) the nucleotide sequence of a degenerate variant of (i) or (ii), wherein said nucleotide sequence is expressed when said transformed whole plant is exposed to fungi, said transformed whole plant having increased resistance to said fungi as compared to an untransformed whole plant of the same plant species exposed to the same fungi under the same conditions, and said increased resistance to said fungi being a result of the expression of said nucleotide sequence.

5,589,622

PLANT PARASITIC NEMATODE CONTROL

Sarah J. Gurr, York; Michael J. McPherson, Dewsbury; Howard J. Atkinson, Leeds, and Dianna J. Bowles, North Yorkshire, all of England, assignors to Advanced Technologies (Cambridge) Ltd., Cambridge, England

Continuation of Ser. No. 988,954, Jun. 28, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 356,790

Claims priority, application United Kingdom, Sep. 10, 1990, 9019736; Apr. 19, 1991, 9108471

Int. Cl.[6] C12N *15/09;15/63;* **A01M** *1/00;5/00*

U.S. Cl. 800—205 **34 Claims**

1. A method of controlling nematodes, the method including the steps of:

a) identifying a plant gene induced specifically at or adjacent to a nematode feeding site within a successfully nematode-infected plant;

b) preparing a construct by combining a promoter region of said plant gene with a further region which codes for a product disruptive of nematode attack; and,

c) transforming plants with the construct to obtain plants which are nematode resistant.

25. A nematode resistant transgenic plant incorporating a modified gene derived from a method according to claim 1.

5,589,623

GENETIC CONTROL OF ETHYLENE BIOSYNTHESIS IN PLANTS

Adolph J. Ferro, Lake Oswego; Richard K. Bestwick, Portland, and Lyle R. Brown, Corvallis, all of Oreg., assignors to Agritope, Inc., Beaverton, Oreg.

Continuation of Ser. No. 255,833, Jun. 8, 1994, Pat. No. 5,416,250, which is a continuation of Ser. No. 613,858, Dec. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 448,095, Dec. 12, 1989, abandoned. This application Dec. 20, 1994, Ser. No. 360,974

Int. Cl.[6] A01H *4/00;* **C12N** *15/82*

U.S. Cl. 800—205 **10 Claims**

10. A transgenic plant containing a DNA sequence which encodes and expresses a S-adenosylmethionine hydrolase enzyme, where said enzyme can hydrolyze S-adenosylmethionine to homoserine and 5'-methylthioadenosine.

5,589,624

ANTIFUNGAL POLYPEPTIDE AND PROCESS FOR ITS PRODUCTION

Norbert Ulbrich, Berlin; Rolf Hilgenfeld, Friedrichsdorf; Heinz Hänel, Oberursel; Burkhard Sachse, Kelkheim; Peter Braun, Mainz; Joachim Wink, Rödermark; Peter Eckes, Kelkheim; Jürgen Logemann, and Jozef Schell, both of Köln, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 945,982, Oct. 30, 1992, Pat. No. 5,421,839. This application Jan. 13, 1995, Ser. No. 372,455

Claims priority, application Germany, Jun. 15, 1990, 40 19 105.2; Mar. 6, 1991, 41 07 140.9

Int. Cl.[6] C12N *5/04;5/10;15/09;15/31;* **A01H** *1/00;5/00*

U.S. Cl. 800—205 **19 Claims**

1. A plant cell which expresses the polypeptide with the amino acid sequence Ala-Thr-Tyr-Asn-Gly-Lys-Cys-Tyr-Lys-Lys-Asp-Asn-Ile-Cys-Lys-Tyr-Lys-ala-Gln-Ser-Gly-Lys-Thr-Ala-Ile- Cys-Lys-Cys-Tyr-Val-Lys-Lys-Cys-Pro-Arg-Asp-Gly-Ala-Lys-Cys-Glu- Phe-Asp-Ser-Tyr-Lys-Gly-Lys-Tyr-Cys (SEQ ID NO: 1).

5,589,625

TRANSGENIC PLANTS DISPLAYING MULTIPLE VIRUS RESISTANCE AND A PROCESS FOR THEIR PRODUCTION

Mart Saarma, Helsinki, Finland; Merikke Kelve; Erkki Truve, both of Tallin, Estonia, and Teemu Teeri, Espoo, Finland, assignors to Kemira Oy, Biotech, Helsinki, Finland

Continuation-in-part of Ser. No. 965,343, Oct. 23, 1992, abandoned. This application Jan. 18, 1995, Ser. No. 374,229

Claims priority, application European Pat. Off., Mar. 18, 1992, 92104676

Int. Cl.[6] A01H *5/00;* **C12N** *15/82*

U.S. Cl. 800—205 **24 Claims**

1. A transgenic plant that utilizes the 2,5A oligoadenylate pathway and displays resistance to multiple plant viral taxonomic groups comprising a genetically engineered DNA sequence encoding at least one polypeptide having a 2,5A synthetase activity, wherein said polypeptide activates an endonuclease causing degradation of viral RNA.

5,589,626

USE OF LYSOZYME GENE STRUCTURES IN PLANTS TO INCREASE RESISTANCE

Rüdiger Hain, Langenfeld, and Klaus Sterzel, Duesseldorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 163,493, Dec. 7, 1993, abandoned, which is a division of Ser. No. 555,557, Jul. 19, 1990, Pat. No. 5,349,122. This application Feb. 14, 1995, Ser. No. 389,085

Claims priority, application Germany, Aug. 10, 1989, 39 26 390.8

Int. Cl.[6] A01H *5/00;5/10;* **C12N** *15/56;15/82*

U.S. Cl. 800—205 **41 Claims**

10. Transformed whole plants, said transformed whole plants being other than solanaceous plants, said transformed whole plants comprising in their genome one or more lysozyme gene structures, said lysozyme gene structures expressing lysozyme, said lysozyme gene structures comprising a chimetic gene fusion of the TR promoter, the signal peptide-encoding sequence of barley alpha-amylase and one or more lysozyme genes, and said transformed plants, as a result of being transformed with said lysozyme gene structures, exhibiting an increased resistance to said fungus as compared to a plant of the same plant species which is not so transformed.

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5,589,627

SENSOR FAULT DETECTION

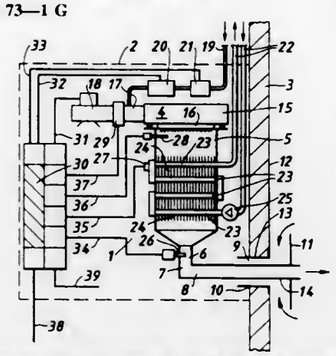
David M. Sutton, Camberley, Great Britain, assignor to British Gas plc, London, Great Britain

Filed Jan. 31, 1995, Ser. No. 381,562

Claims priority, application United Kingdom, Feb. 2, 1994, 9402018

Int. Cl.[6] F23N *5/00*

U.S. Cl. 73—1 G **7 Claims**



1. Apparatus for compensating for faults in a sensor providing an output signal representative of the aeration of a combustible mixture, the apparatus comprising means for checking whether a current value of a stored reference signal with which the output signal is compared to control the aeration is suitable for causing an intended value of aeration to be maintained, means for estimating a corrected value of the stored reference signal in the event that a current value of the stored reference signal is found on checking not to be suitable for causing an intended value of aeration to be maintained and means for storing the corrected value of the reference signal with which the output signal is then compared.

5,589,628

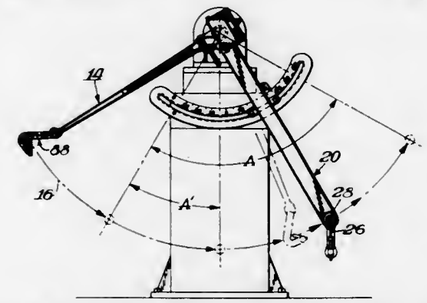
GOLF BALL STRIKING DEVICE

Joseph M. Braly, Kennett Square, Pa., assignor to PGA Tour, Ponte Vedra, Fla.

Filed Dec. 19, 1995, Ser. No. 575,092

Int. Cl.[6] G01N *3/30*

U.S. Cl. 73—12.02 **17 Claims**



1. A golf ball striking device comprising a framework, a club and shaft assembly rotatably mounted to the framework for movement along a swing path in a first vertical plane, and a golf ball tee assembly having upper and lower ends with the upper end rotatably mounted to the framework for free movement of the golf ball tee assembly in a second vertical plane into any one of a plurality of positions, means for releasably locking the golf ball tee assembly in place at any one of the plurality of positions, a golf ball tee at the lower end of the golf ball tee assembly for supporting a golf ball in the first vertical plane in the swing path of the club and shaft assembly, means on the golf ball tee assembly for maintaining the tee vertical at any of the plurality of positions of the golf ball tee assembly, and motivator means connected to drive the club and shaft assembly along its swing path for impacting a golf ball on the tee.

5,589,629

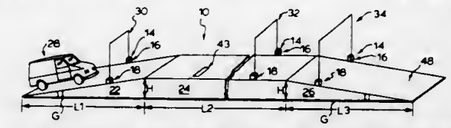
METHOD AND APPARATUS FOR TESTING VEHICLE EXHAUST EMISSIONS

Stephen J. Quinn, 91 Breckonwood Cr., Thornhill, Ontario, Canada

Filed Apr. 25, 1995, Ser. No. 429,237

Int. Cl.[6] G01N *21/00*

U.S. Cl. 73—23.31 **19 Claims**



1. A method of spectroscopic testing of exhaust emissions of vehicles having internal combustion engines to estimate whether the emissions of any vehicle meet predetermined standards, comprising:

moving each said vehicle under its own power along a test track under controlled conditions of operation,

said test track having an upwardly inclined portion, a horizontal portion and a downwardly inclined portion, the method comprising the steps of:

(a) moving the vehicle to ascend the upwardly inclined portion at a positive rate of acceleration and within a predetermined first range of velocities, and remotely testing the exhaust emissions of the vehicle by spectroscopic means as the vehicle ascends the upwardly inclined portion at a first test point on the upwardly inclined portion;

(b) moving the vehicle across the horizontal portion at a substantially constant velocity and within a predetermined second range of velocities, and remotely testing the exhaust emissions of the vehicle by spectroscopic means as the vehicle crosses the horizontal portion at a second test point on the horizontal portion; and

(c) moving the vehicle to descend the downwardly inclined portion at a negative rate of acceleration and within a predetermined third range of velocities, and remotely testing the exhaust emissions of the vehicle by spectroscopic means as the vehicle descends the downwardly inclined portion at a third test point on the downwardly inclined portion;

comparing the test results from the first, second and third test points of one vehicle with results for vehicles which meet the predetermined standards, said steps (a), (b) and (c) being performed in any order.

5,589,630

FAST GAS CHROMATOGRAPHY METHOD, APPARATUS AND APPLICATIONS

Patrick M. Wiegand, South Charleston; John F. Fisher, St. Albans; John R. Parrish, Cross Lanes; Elizabeth S. Ballard, Charleston; Courtland P. Sears, III, Dunbar; George W. Schwarz, Jr., and Cloid R. Smith, III, both of Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 88,677, Jul. 7, 1993, Pat. No. 5,437,179.

This application Apr. 26, 1995, Ser. No. 429,185

Int. Cl.[6] G01N *30/54*

U.S. Cl. 73—23.35 **3 Claims**

1. A fast temperature programming module for heating and cooling a gas chromatographic column, comprising:

a) cylindrical body having two parallel, circular faces, said body comprising an inlet means in the center of one of the circular

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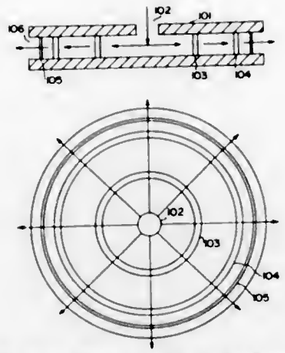


faces and an exit means located at the perimeter of the faces for the passage of heat transfer fluid through said body, said body being suitable for the location of a gas chromatographic column therein:

b) circular heating means located inside said body, said heating means being capable of imparting a temperature change to the heat transfer fluid; and

means to provide an electrical current to said heating means in order to impart a temperature change to said heating means.

5,589,631

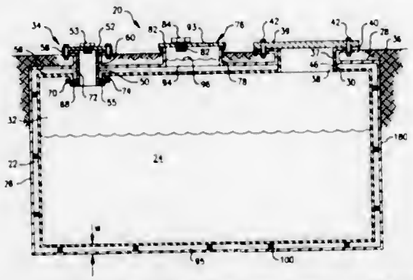
LEAK DETECTION WITH NON-TOXIC LIQUIDS

G. Everett Spring, Makawao, Hl., and Douglas V. Keller, Jr., Lafayette, N.Y., assignors to Spring Patents Corporation, Makawao, Hl.

Continuation of Ser. No. 922,622, Jul. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 530,613, Jul. 9, 1990, Pat. No. 5,184,504, and a continuation-in-part of Ser. No. 673,772, Mar. 21, 1991, abandoned. This application Jul. 26, 1994, Ser. No. 281,854

Int. Cl.[6] G01M *3/32*

U.S. Cl. 73—49.2 **4 Claims**



1. A method of detecting leaks in a system comprising a primary containment for a substance with a fluid phase and a secondary containment enveloping the primary containment, said method comprising the steps of:

filling the space between the primary containment and the secondary containment with a non-corrosive, nontoxic, leak detection liquid which contains vegetable oil and citric acid in a minor amount effective to reduce the concentration of oxidation catalyzing metal ions in said liquid, said vegetable oil: (a) having a viscosity of not more than 100 centistokes at a temperature of −25° F., (b) being essentially stable over a temperature range of −25° to 140° F., and (c) being essentially chemically inert relative to the materials from which the primary and secondary containments are fabricated; and

said method further comprising the step of monitoring a characteristic of or associatable with said leak detection liquid for a change indicative of a leak in at least one of said components.

5,589,632

METHOD AND DEVICE FOR ESTIMATING THE THRUST OF A RAMJET

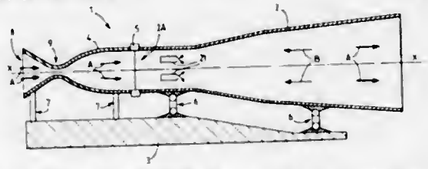
Alain Chevalier, and Vincent Protat, both of Bourges, France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed May 9, 1995, Ser. No. 437,058

Claims priority, application France, May 18, 1994, 94 06058

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—117.4 **12 Claims**



1. A method for estimating a thrust of a ramjet, said method comprising:

(a) mounting a combustion chamber of the ramjet on support means for providing said combustion chamber with partial freedom of longitudinal movement;

(b) arranging blowing means, comprising a nozzle which is fixed in position relative to said support means, at an intake of said combustion chamber;

(c) arranging, between said nozzle and the intake of said combustion chamber, at least one flexible bladder which is filled with a fluid;

(d) blowing air through said nozzle into the combustion chamber so as to create in said combustion chamber feed conditions which are identical to operational feed conditions existing during a defined operation of the ramjet;

(e) feeding fuel to said combustion chamber so as to generate combustion; and

(f) measuring the pressure of the fluid contained in said bladder, said pressure resulting from a displacement of said combustion chamber with respect to said nozzle during the combustion.

5,589,633

METHOD AND APPARATUS FOR MEASURING PUMPING ROD POSITION AND OTHER ASPECTS OF A PUMPING SYSTEM BY USE OF AN ACCELEROMETER

James N. McCoy, 2210 Midwestern Pkwy., Wichita Falls, Tex. 76308; Jerry B. West, Dallas, and Augusto L. Podio, Austin, both of Tex., assignors to James N. McCoy, Wichita Falls, Tex.

Division of Ser. No. 808,578, Dec. 17, 1991, Pat. No. 5,406,482. This application Apr. 7, 1995, Ser. No. 418,378

Int. Cl.[6] G06F *15/00*

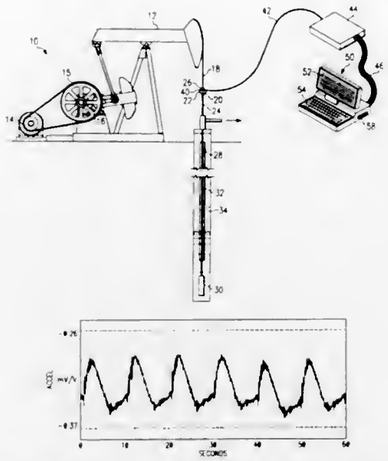
U.S. Cl. 417—63 **3 Claims**

1. A method for analyzing the performance of a pumping system for an oil well by use of an accelerometer, wherein said pumping system includes a rod connected to a downhole pump, comprising the steps of:

mounting said accelerometer to said pumping system, wherein said accelerometer produces an output signal,

digitizing said output signal to produce a first digital data set,

storing said first digital data set in a memory of a computer, and



displaying said first digital data set as a waveform on a display screen of said computer wherein said waveform includes features indicating performance of said pumping system.

5,589,634

SEMICONDUCTOR ACCELERATION SENSOR FOR DETECTING ACCELERATION IN ORTHOGONAL DIRECTIONS

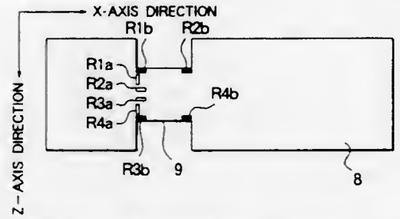
Teruaki Nagahara, and Masahiro Yamamoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1995, Ser. No. 512,632

Claims priority, application Japan, Mar. 15, 1995, 7-056223

Int. Cl.[6] G01P *15/12*

U.S. Cl. 73—514.33 **2 Claims**



1. A semiconductor acceleration sensor comprising.

an acceleration sensor beam having first and second opposing surfaces;

a diaphragm formed on the first surface of said acceleration sensor beam, said diaphragm having a width less than the width of the acceleration sensor beam as measured in a direction perpendicular to the longitudinal axis of said acceleration sensor beam;

a pair of groups of gauge resistors arranged on a first side of said diaphragm at end portions of said diaphragm as viewed in the longitudinal direction of said acceleration sensor beam;

first and second bridge circuits formed by electrically connecting the gauge resistors of the respective groups, said first bridge circuit being formed by connecting the gauge resistors of one of said groups to sense acceleration acting in direction of thickness of said acceleration sensor beam, the second bridge circuit being formed by connecting the gauge resistors of the other of said groups to sense acceleration acting in the direction which is perpendicular both to the longitudinal and thickness directions of said acceleration sensor beam, wherein each gauge resistor of said second bridge circuit is disposed at a respective corner of the first side of said diaphragm.

5,589,635

AUTOMATED TAPPING PROCESS FOR COMPLEX PARTS USED FOR DETECTING SHALLOW FAULTS

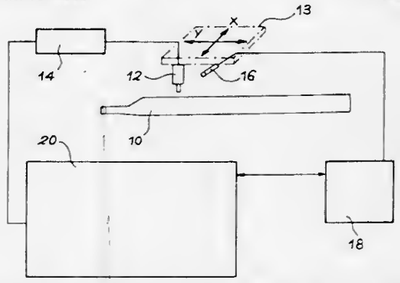
Gilles Baudrillard, Suresnes, and Christophe P. Bouju, Paris, both of France, assignors to Aerospatiale Soclete Nationale Industrielle, France

Filed Aug. 8, 1995, Ser. No. 512,531

Claims priority, application France, Aug. 8, 1994, 94 09808

Int. Cl.[6] G01N *9/24*

U.S. Cl. 73—600 **12 Claims**



1. Process for tapping a complex part, wherein the part is subject to successive shocks based on impacts distributed over a surface to be tested of the part and a diagnosis relative to a presence of shallow faults is deduced from an acoustic response produced by said shocks, in which sound signals produced by each shock are collected and at least two successive sound signals are compared with one another in order to deduce therefrom in automated manner a fault diagnosis when a significant difference is detected between these successive sound signals.

5,589,636

METHOD OF AND APPARATUS FOR THE DETECTION OF AN ULTRASONIC FIELD

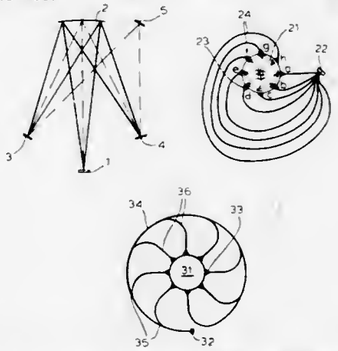
Wieslaw Bicz, Wroclaw, Poland, assignor to Sonident Anstalt Liechtensteinischen Rechts, Vaduz, Liechtenstein

Filed Dec. 6, 1994, Ser. No. 349,880

Claims priority, application Germany, Apr. 22, 1994, 44 14 081.9

Int. Cl.[6] G01B *17/00;* **G06K** *9/00*

U.S. Cl. 73—617 **11 Claims**



1. A method for detecting ultrasonic waves propagated through a medium, comprising the steps of:

(a) at a given time collecting respective ultrasonic waves at each of a plurality of spaced apart collection locations in said medium;

(b) passing ultrasonic waves collected at said given time at each of said collection locations from the respective collection location to a common detection site along a respective ultrasonic wave path assigned to the respective collection location

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having a sound transit time different from sound transit times of others of said ultrasonic wave paths terminating at said common detection site; and

(c) detecting ultrasonic waves received at said common detection site with a single transducer responsive to ultrasonic waves from a plurality of said paths and received in a time-spaced relationship determined by the respective sound transit times, and converting the detected ultrasonic waves to electrical signals with said transducer.

5,589,637

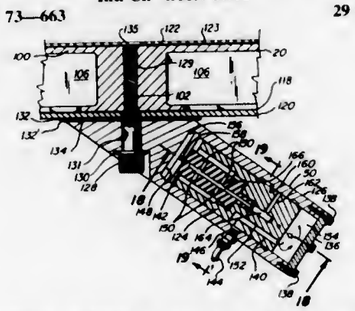
EXCITER-MOUNTING FOR SHAKER TABLE

Gregg K. Hobbs, Westminister, Colo., assignor to Qualmark Corporation, Denver, Colo.

Division of Ser. No. 950,631, Aug. 27, 1992, Pat. No. 5,365,788, which is a continuation-in-part of Ser. No. 487,757, Mar. 1, 1990. This application Nov. 22, 1994, Ser. No. 344,544

Int. Cl.[6] G01N *29/12*

U.S. Cl. 73—663 **29 Claims**



1. Screening apparatus for imparting vibrational acceleration forces to a device to be tested, comprising:

a shaker table having a top surface and a bottom surface with device mounting means for securely attaching the device to said top surface; and

an exciter that produces vibrational acceleration forces with exciter mounting means for connecting said exciter to said bottom surface of the table, said exciter mounting means including said table having a table hole extending through said table from said bottom surface to said top surface and including said exciter having an exciter hole that extends through said exciter and aligns axially with said table hole an exciter mounting bolt extending through said exciter hole in said exciter and into said table hole said exciter mounting bolt having a tapped center bore extending axially into said exciter mounting bolt in a manner that is accessible from the top surface of the table for receiving and fastening a threaded device mounting bolt into said exciter mounting bolt.

5,589,638

PRESSURE SENSOR HAVING A HEAT CONDUCTING ELEMENT BETWEEN THE PRESSURE TRANSMITTING ELEMENT AND THE PRESSURE SENSOR HOUSING

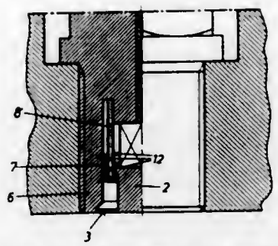
Josef Glaser, Graz, and Pierre Fornet, Leibnitz, both of Austria, assignors to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed May 30, 1996, Ser. No. 655,463

Claims priority, application Austria, Jun. 2, 1995, A950/95

Int. Cl.[6] G01L *7/00*

U.S. Cl. 73—706 **6 Claims**



1. Pressure sensor comprising a housing containing a measuring device which is separated from said housing by a radial gap and comprises a pressure transmitting element and a measuring element, said pressure sensor comprising a sealing membrane tightly and flexibly connecting said housing and said pressure transmitting element on a side facing a medium to be measured, wherein at least one heat conducting element is provided between said pressure transmitting element and said housing, said heat conducting element being made from a material of good thermal conductivity and having a large cross-section for heat conduction such that most of the heat arising in a region of said pressure transmitting element is carried off to said housing via said heat conducting element, acting as bending or rolling element in the instance of axial shifts between said pressure transmitting element and said housing and being flexible in axial direction as regards force transmission.

5,589,639

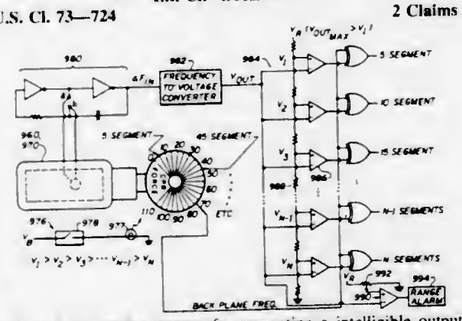
SENSOR AND TRANSDUCER APPARATUS

Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13090, and Nicholas J. D'Antonio, 138A Long Rd., Tully, N.Y. 13159

Continuation-in-part of Ser. No. 621,653, Dec. 31, 1990, Pat. No. 5,279,163, which is a continuation-in-part of Ser. No. 834,939, Feb. 28, 1986, Pat. No. 4,823,619, and a continuation-in-part of Ser. No. 151,483, Feb. 2, 1988, Pat. No. 4,987,783. This application Jan. 18, 1994, Ser. No. 182,578

Int. Cl.[6] G01L *9/00*

U.S. Cl. 73—724 **2 Claims**



1. A force sensing system for generating a intelligible output signal corresponding to a parameter, said system comprising:

sensing means having a stationary first portion and a second portion movable relative to the first portion for generating an electric reactance signal corresponding to the parameter;

first supporting means connected to a housing or conduit for supporting said first portion of said sensing means;

second deflectable supporting means for supporting said movable second portion of said sensing means;

securing means for securing said first and second supporting means in a movable relationship, said first and second supporting means being movable relative to each other in response to the occurrence of said parameter to move said movable second portion with respect to said stationary first portion of said sensing means to generate said electric reactance signal;

processing means including reactance controlled square wave generator means for receiving said reactance signal and for generating a corresponding variable period pulse train transduced signal, voltage converter means for establishing a voltage signal having a magnitude proportional to the frequency of the variable period pulse train transduced signal, and means for receiving said voltage signal and generating an intelligible output signal reflective of the magnitude and variation in said voltage signal; and

transmitting means for transmitting said electric reactance signal from said sensing means to said processing means.

5,589,640

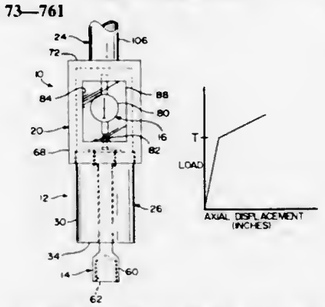
METHOD FOR DETECTING CHANGES IN PRELOAD ON A TIE ROD INSTALLED AS PART OF A CORE SHROUD REPAIR IN A BOILING WATER REACTOR

Patrick J. Butler, 6909 Duke Dr., Alexandria, Va. 22307

Filed Apr. 3, 1996, Ser. No. 627,154

Int. Cl.[6] F16B *31/02*

U.S. Cl. 73—761 **10 Claims**



1. In a boiling water reactor having a core shroud disposed within a reactor vessel and a plurality of tie rods installed with an initial preload between vertically spaced sites on the core shroud at a respective plurality of angularly spaced locations about the shroud periphery as part of a core shroud repair, a method of measuring preload on an installed tie rod to determine whether the preload on the tie rod has changed since installation, said method comprising the steps of

(a) lowering a tool into the reactor vessel from a remote location positioned externally of the reactor vessel;

(b) attaching the tool to an upper portion of the tie rod;

(c) using the tool to apply a tensile load along a longitudinal axis of the tie rod;

(d) measuring the tensile load as it is applied to the tie rod;

(e) measuring axial displacement of the tie rod as the tensile load is applied;

(f) plotting the load measured in step (d) versus the axial displacement measured in step (e); and

(g) identifying a change in slope on the load-displacement plot occurring at a load corresponding to the tie rod preload.

5,589,641

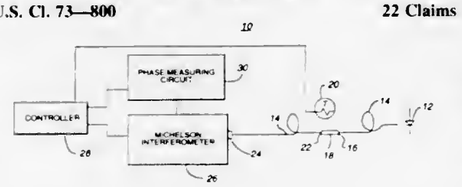
STRAIN AND FABRY-PEROT ETALON MEASUREMENT SYSTEM AND METHOD

Bartley C. Johnson, Clayton, and John H. Belk, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Jun. 5, 1995, Ser. No. 461,820

Int. Cl.[6] G01L *1/24*

U.S. Cl. 73—800 **22 Claims**



10. A method of measuring strain, comprising the steps of:

(a) transmitting a low-coherence light through an optical strain sensor;

(b) coupling an output of the optical strain sensor and a high-coherence light source into a coherence detector;

(c) determining an equal optical path length point;

(d) measuring a first phase change of the high-coherence light source from the equal optical path length point to a first optical path length of the strain sensor;

(e) applying a strain to the optical strain sensor;

(f) measuring a second phase change of the high-coherence light source from the equal optical path length point to a second optical path length of the strain sensor; and

(g) calculating a difference phase change from the first phase change and the second phase change.

5,589,642

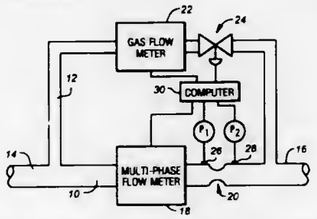
HIGH VOID FRACTION MULTI-PHASE FLUID FLOW METER

Joram Agar, Grand Cayman, Cayman Islands, and David Farchi, Houston, Tex., assignors to Agar Corporation Inc., Houston, Tex.

Filed Sep. 13, 1994, Ser. No. 305,344

Int. Cl.[6] G01F *1/74*

U.S. Cl. 73—861.04 **25 Claims**



1. A high void fraction measuring multi-phase fluid flow meter for measuring flow of a multi-phase fluid, comprising:

a first fluid flow path including a first flow measuring device for measuring gas and liquid flow and a restrictor coupled in series with said first flow measuring device thereby to slow the flow of fluid through said first flow measuring device when said fluid includes liquid;

a second fluid flow path in parallel with said first fluid path and including a second flow measuring device for measuring gas flow;

means for detecting liquid flow in said flow meter;

means for diverting flow of gas into said second fluid flow path liquid flow when liquid flow is not detected by said detecting means;

means for outputting an indication of the amount of liquid flow through said first flow measuring device and combined total amount of gas flow through said first and second flow measuring devices.

5,589,643

ACROSS THE WALL PRESSURE DIFFERENTIAL INDICATOR

Robert D. Pyle, 3286 Balsam Ridge St., White Oak, Ohio 45239

Filed Apr. 25, 1995, Ser. No. 428,503

Int. Cl.[6] G01F *1/28*

U.S. Cl. 73—861.75 **10 Claims**

1. An across the wall pressure differential indicating apparatus comprising:

a wall duct having first and second open ends,

first and second mounting plates respectively attached to said wall duct at said first and second open ends respectively, and

a low speed airflow indicator is adapted to indicate a pressure differential and is mounted in full fluid communication with

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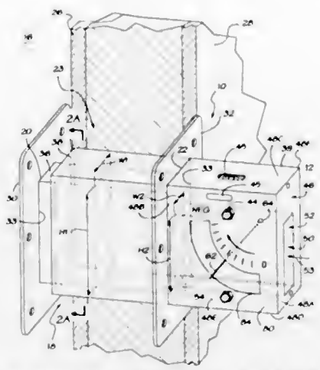


said wall duct at one of said ends such that all airflow passing through said wall duct also passes through said indicator.

5,589,644

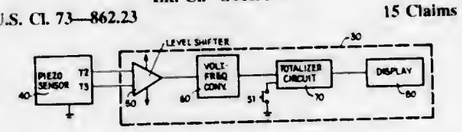
TORQUE-ANGLE WRENCH

Thomas P. Becker; Matthew M. Crass, both of Kenosha; Gordon A. Putney, Lake Geneva; Randy J. Niesen, Kenosha, and Dean J. Iwinski, Muskego, all of Wis., assignors to Snap-on Technologies, Inc., Crystal Lake, Ill.

Filed Dec. 1, 1994, Ser. No. 347,871

Int. Cl.[6] G01L *5/00*

U.S. Cl. 73—862.23 **15 Claims**



1. A torque-angle wrench comprising:

a handle for applying torque through a tightening angle at a rotational angular velocity;

a piezoelectric gyroscopic sensor, including a vibrating body responsive to rotation of said handle, for generating an electrical signal representative of the rotational angular velocity; and

integrating means for converting said electrical signal into an output signal representing degrees of rotation of said handle, said integrating means including a voltage to frequency converter and a totalizer circuit, said electrical signal being converted to a digital pulse signal by said voltage to frequency converter and said digital pulse signal being fed directly to said totalizer circuit which, on the basis of said digital pulse signal, generates said output signal.

5,589,645

STRUCTURE OF MAGNETOSTRICTIVE SHAFT APPLICABLE TO MAGNETOSTRICTION-TYPE TORQUE SENSOR FOR DETECTING TORQUE APPLIED TO ROTATABLE SHAFT AND METHOD FOR MANUFACTURING THE SAME

Nobuaki Kobayashi; Satoshi Kaise, and Hideki Kano, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

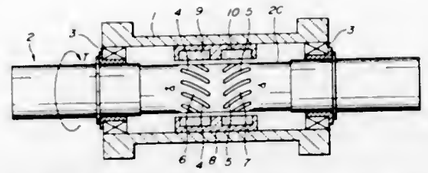
Filed Nov. 22, 1994, Ser. No. 345,751

Claims priority, application Japan, Nov. 30, 1993, 5-326325; Dec. 3, 1993, 5-339290

Int. Cl.[6] G01L *3/10;* **G01R** *33/18*

U.S. Cl. 73—862.335 **6 Claims**

1. A structure of a magnetostriction-type torque sensor, comprising:



a) a cylindrical outer casing;

b) a magnetostrictive shaft disposed within said outer casing so as to enable a rotation thereof according to a torque applied thereto; and

c) a pair of self-inductance determining coils, each coil being connected to a torque magnitude and direction detection circuitry and being wound around a radial part of an outer peripheral surface of the magnetostrictive shaft with a gap provided against the outer peripheral surface, wherein said magnetostrictive shaft comprises a shaft parent material made of a non-magnetic austenitic series metallic material and a magnetic thin film formed on the whole outer peripheral surface of said shaft parent material, said magnetic thin film being made of a magnetostriction material.

5,589,646

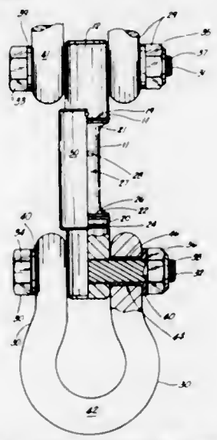
TENSION LOAD CELL APPARATUS

Jon E. Khachaturian, and William B. Thrift, both of New Orleans, La., assignors to Versabar, Inc., Harvey, La.

Continuation-in-part of Ser. No. 36,184, Mar. 23, 1993, Pat. No. 5,429,007. This application Jul. 3, 1995, Ser. No. 498,022

Int. Cl.[6] G01L *1/22*

U.S. Cl. 73—862.474 **20 Claims**



11. A method of generating a tension load value with a load cell comprising the steps of:

a) providing a structural member of metallic construction having a pair of larger diameter end portions and a smaller diameter center portion, each larger diameter portion having a transverse opening that receives a lifting pin;

b) generating a tension load value with a strain gauge mounted at the center portion of the structural member responsive to an elongation of the structural member when loaded;

c) covering the center section with a casing;

d) attaching one end portion of the casing to one of the larger diameter end portions of the structural member;

e) the other larger diameter end portion of the casing from the structural member so that the structural member can elongate independently of the casing when the structural member is loaded; and

f) wherein in step "b" the flow of the strain field from the transverse openings through the center portion remains smooth, parallel and free of substantial discontinuity.

5,589,647

FLEXIBLE SENSOR TUBE AND METHOD FOR DETERMINING A CONCENTRATION CURVE OF A MEDIUM ALONG A PATH WITH THE FLEXIBLE SENSOR TUBE

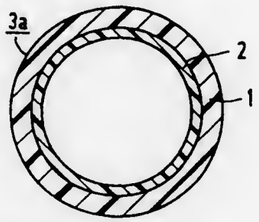
Peter Jax, Erlangen, and Klaus Ruthrof, Nürnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 19, 1995, Ser. No. 491,395

Claims priority, application Germany, Dec. 17, 1992, 42 42 806.8

Int. Cl.[6] G01N *37/00*

U.S. Cl. 73—863.23 **5 Claims**



1. A sensor assembly, comprising:

a sensor and

a flexible tube communicating with said sensor and extending along a given path for determining a concentration curve of a medium along the given path, said flexible tube being formed of a material having relatively good permeability to the medium and having an inner surface; and

a thin coating completely covering said inner surface and being formed of a material having relatively poor permeability to the medium.

5,589,648

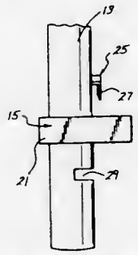
TEST KIT GRIPPING APPARATUS

Matthew A. Valbuena, 23235 Sky Dr., Lake Forest, Calif. 92630

Filed Nov. 18, 1994, Ser. No. 342,216

Int. Cl.[6] G01N *1/12*

U.S. Cl. 73—864.51 **10 Claims**



1. A gripping apparatus for a water test kit, said water test kit comprising a housing having a base portion, an upper portion, and two side edges, said gripping apparatus comprising:

a handle element;

a retaining bracket having a base portion and two side arm portions, said side arm portions being adapted to grip said two water test kit side edges;

a slit disposed on said handle element for receiving a base portion of said test kit; and

clip means disposed on said handle element above said slit for securing an upper portion of said test kit to said handle element;

wherein said gripping apparatus may be used to manipulate said water test kit into a predetermined submerged location within a body of water for the purpose of obtaining one or more samples of said water.

5,589,649

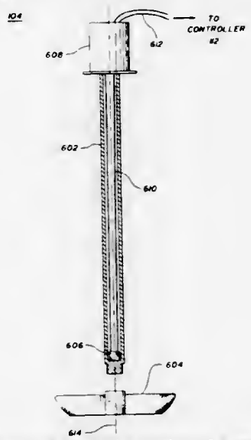
DISSOLUTION TESTING APPARATUS

Gerald Brinker, North Brunswick; Peter Hladik, Piscataway, both of N.J., and Alan Gutwillig, Sterling, Va., assignors to Distek, Inc., North Brunswick, N.J.

Continuation of Ser. No. 201,633, Feb. 25, 1994, abandoned. This application Feb. 14, 1995, Ser. No. 389,063

Int. Cl.[6] G01N *13/00;* **B01L** *7/00*

U.S. Cl. 73—866 **63 Claims**



1. An apparatus for dissolution testing of a material in a test solution within a test vessel, comprising:

(a) a stirring element for stirring the test solution;

(b) a non-liquid-bath heating element placed around the outside of the test vessel for heating the test solution; and

(c) a controller for controlling the heating element to control the temperature of the test solution, wherein the stirring element comprises:

(1) a hollow shaft; and

(2) a temperature sensor located within the hollow shaft for generating signals representative of the temperature of the test solution when the hollow shaft is inserted into the test solution, wherein the controller controls the heating element in accordance with the signals from the temperature sensor.

5,589,650

APPARATUS AND METHOD FOR DEFINING MOLDING TECHNOLOGICAL PROPERTIES OF MOLDING SUBSTANCES IN CASTING WORKS

Eckardt Flemming; Werner Tilch, both of Freiberg; Thomas Schuszter, Augsburg; Marian Ivanov, Freiberg, and Paul Eirich, Handheim, all of Germany, assignors to Maschinenfabrik Gustav Eirich, Germany

Filed Apr. 21, 1994, Ser. No. 230,892

Claims priority, application Germany, Apr. 21, 1993, 43 12 939.0; Apr. 21, 1993, 43 12 938.2

Int. Cl.[6] G01N *33/38;29/18;29/00;29/10*

U.S. Cl. 73—866 **25 Claims**

5. A process for defining properties and composition of molding sand which comprises:

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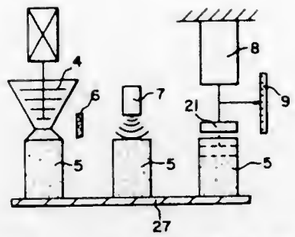
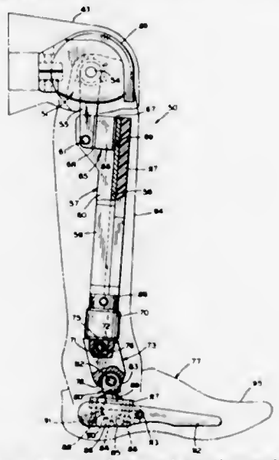


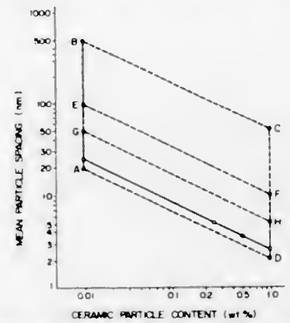
a) introducing a sample of the molding sand into a test sleeve having a side wall and opposing ends;
b) compressing the sample within said sleeve by means of a stamp and pressure plate which move toward each other to compress the sample within the sleeve to form a compressed sample having opposing ends;
c) after compressing the sample measuring a length of the sample between the stamp and pressure plate;
d) measuring ultrasonic speed through the sample by means of at least one ultrasonic transducer located at one of said ends;
e) measuring at least one other property of the sample selected from the group consisting of moisture content, compressibility, ultrasound attenuation and temperature; and
f) using all of such measurements to define the properties of the sample.

5,589,651
LOWER LEG FOR CRASH TEST DUMMY
David C. Viano, Bloomfield Hills; Edward A. Jedrzejczak, Brown City, and Joseph G. Smrcka, Northville, all of Mich., assignors to First Technology Safety Systems, Inc., Plymouth, Mich.
Filed Oct. 28, 1994, Ser. No. 331,282
Int. Cl.[6] G01B *3/10*
U.S. Cl. 73—866.4 **9 Claims**



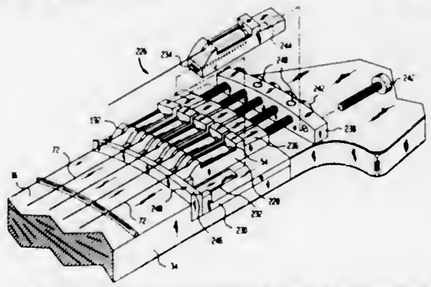
4. A lower leg assembly for a crash test dummy having a thigh bone comprising:
a tibia having an upper end, a lower end for connecting to a foot assembly of a crash test dummy and a front surface extending between said upper and lower ends of said tibia;
a pivot arm having an upper end adapted for pivotal connection to a lower end of a thigh bone of the crash test dummy and a lower end pivotally connected to said upper end of said tibia;
a lower leg skin having an interior space surrounded by an inner wall, said tibia being retained in said interior space; and
a leg laceration indicator being retained in said interior space between said inner wall and said front surface for indicating crash injuries whereby said leg laceration indicator is at least one of lacerated, punctured and inelastically deformed by forces applied to a portion of said lower leg skin abutting said leg laceration indicator during a crash test.

5,589,652
CERAMIC-PARTICLE-DISPERSED METALLIC MEMBER, MANUFACTURING METHOD OF SAME AND USE OF SAME
Toshiaki Arato, Katsuta; Yasuhisa Aono, Hitachi; Shigeo Tsuruoka, Hitachi, and Katsuhiro Komuro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 23, 1994, Ser. No. 200,731
Claims priority, application Japan, Mar. 18, 1993, 5-058335
Int. Cl.[6] C22C *9/00*
U.S. Cl. 75—235 **18 Claims**



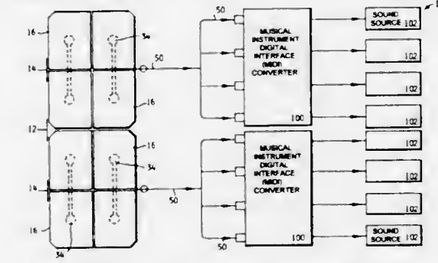
3. A ceramic-particle-dispersed metallic member in which ceramic super fine particles, and solid lubricant particles or solid lubricant short size fibers are dispersed, wherein said ceramic super fine particles have the content not more than 1 wt % and the mean grain size not more than 200 nm, and a region where said ceramic super fine particles are dispersed in a matrix by not less than 500 in number per section area of one square micrometer at 1 wt % is formed substantially over the entirety region of said metallic member.

5,589,653
TUNING SYSTEMS FOR STRINGED INSTRUMENTS
Floyd D. Rose, 114 Via de la Valle, Del Mar, Calif. 92104
Filed Jun. 7, 1995, Ser. No. 484,121
Int. Cl.[6] G10D *3/06*
U.S. Cl. 84—314 N **6 Claims**



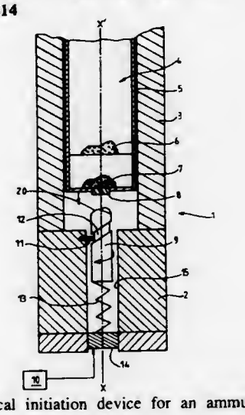
1. A stringed instrument comprising: a body; a neck attached to said body; a fretboard having first and second ends arranged on said body; a nut assembly mounted on said neck at one end of said fretboard, said nut assembly comprising a plurality of individually pivotable string holders in combination with a fixed nut having a plurality of corresponding nut critical contact surfaces; a bridge including a plurality of bridge critical contact surfaces mounted on said body spaced from an opposing end of said fretboard, said plurality of bridge critical contact surfaces arranged at a selectively adjustable distance from corresponding ones of said plurality of nut critical contact surfaces; and a plurality of strings each having a first end and a second end and a predetermined length extending between said first and second ends, said plurality of strings extending across and being in contact with said plurality of bridge critical contact surfaces and corresponding ones of said plurality of nut critical contact surfaces and being secured at said first end to said bridge and at said second end to corresponding ones of said plurality of individually pivotable string holders so that said plurality of strings are under tension to permit obtaining of musical notes upon strumming or plucking thereof, said second end of said plurality of strings being selectively moveable with corresponding ones of said plurality of individually pivotable string holders along a path including a vertical component, said bridge including tuning means for obtaining at least harmonic tuning upon adjusting said distance between said plurality of bridge critical contact surfaces and said plurality of nut critical contact surfaces.

5,589,654
ELECTRONIC DANCE FLOOR SYSTEM
Kern T. Konwiser, and Kip M. Konwiser, both of 1 Catamaran St., Ste. A, Marina Del Rey, Calif. 90292
Filed Mar. 7, 1996, Ser. No. 612,117
Int. Cl.[6] G01H *1/02; 1/55*
U.S. Cl. 84—600 **22 Claims**



1. An electronic dance floor system comprising:
a) a composite pad assembly comprising:
(1) an electrical switch module having a side surface, an upper surface, a lower surface and an output that terminates at a pair of output terminals that project from the side surface, where said switch module closes when pressure is applied to the upper surface,
(2) an electrical cable assembly having an inward end and an outward end, where the inward end is attached to the output terminals on said electrical switch module and the outward end is attached to an output jack,
(3) an upper pad section having a lower surface and an upper surface, where to the center of the lower surface is attached, by an attachment means, the upper surface of said electrical switch module,
(4) a lower base section having a lower surface and an upper surface,
(5) a center section having an inward edge, a centered module bore extending therethrough and a cable slot that interfaces with the module bore and that extends normal to the inward edge, wherein said module bore is placed over said electrical switch module and the cable slot is placed over said cable such that the outward end of said cable extends outward from the inward edge of said center section, where when the lower surface of said upper pad section is attached, by an attachment means, to the upper surface of said center section, and the lower surface of said center section is attached, by an attachment means, to the upper surface of said lower base section said composite pad assembly is formed, wherein when pressure is applied to the upper surface of said upper pad section, the pressure closes said switch to produce an analog trigger signal that is applied through the output jack of said cable,
b) a musical instrument digital interface (MIDI) converter which receives the trigger signal from said electrical switch module via the output jack and converts the signal to a corresponding digital signal, and
c) a MIDI equipped sound source that through an audio cable, receives and converts the digital signal to a specific sound produced by said sound source.

5,589,655
ELECTRICAL INITIATION DEVICE WITH CONTACTOR
André Gaulmier, Charenton Du-Cher, France, assignor to Giat Industries, France
Filed Apr. 11, 1995, Ser. No. 420,839
Claims priority, application France, Apr. 15, 1994, 94 04526
Int. Cl.[6] F41F *3/04;* **F41A** *19/00*
U.S. Cl. 89—1.814 **7 Claims**



1. An electrical initiation device for an ammunition igniter, comprising:
a contactor located in a launch tube, the contactor being equipped with means to impart translational movement and means to impart rotational movement, both the translational and rotational movement being imparted to the contractor by the weight of the ammunition on said contactor, and the contactor further being equipped with a head including cleaning means for abutting against and cleaning a contact surface of the ammunition igniter.

5,589,656
SPLIT WEDGE/BREECHBLOCK AND SEALING MEANS FOR GUN
Richard W. Tortorici, Jr., Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 12, 1996, Ser. No. 613,736
Int. Cl.[6] F41A *3/74*
U.S. Cl. 89—24 **8 Claims**

1. A split stepped wedge/breechblock apparatus for opening and closing a powder chamber of a gun tube of a high pressure gun, said apparatus comprises:
a wedge member having a first side adapted to fit against the one end of the gun tube to thereby close the powder chamber of the gun tube, said wedge member including a central longitudinal port which passes from the first side of the wedge member through to a second side of the wedge member and is aligned with the bore centerline of the gun tube when the first

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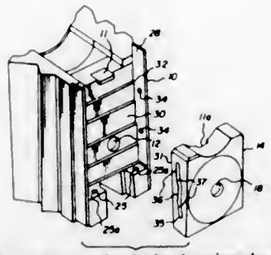


side of the wedge member is fitted against the gun tube, said wedge member further including a sealing means associated with the first side of the wedge member for sealing the wedge member against the gun tube and the second side of the wedge member forming a stepped face,

a breechblock having a first side which includes a stepped face adapted to closely fit with the stepped face of said wedge member, said breechblock including a central longitudinal port which passes from said first side through to a second side and which is aligned with the central port of said wedge member when said breechblock is in a first, closed position, said breechblock being capable of a movement along a path substantially perpendicular to the bore centerline of the gun tube from said first, closed position tu a second, open position, and

means for coupling said breechblock and said wedge member together so as to cause the sealing means of said wedge member to be drawn out of engagement with the gun tube to a drawback position during a first phase of said movement of said breechblock and causes said wedge member to move out of alignment with said gun tube to thereby open the powder chamber during a second portion of said movement of said breechblock.

5,589,657

DETONATING SYSTEM HAVING A DETONATOR WITHIN AN INSULATING CONTAINER

Uwe Gessel, Troisdorf; Rolf Rospek, Edemissen, and Helmut Zollner, Meerbusch, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 26, 1995, Ser. No. 429,530

Claims priority, application Germany, Apr. 26, 1994, 44 14 411.3

Int. Cl.[6] F42C *19/12*

U.S. Cl. 102—202.14 **7 Claims**

2. A detonating system comprising a detonator surrounded by a thermal insulating container, said detonator comprising an electronic detonator which is operative at temperatures up to 150° C., said insulating container comprising Dewar vessel having an open end positioned within an external protective sheath, a sealing plug for closing the open end of the Dewar vessel and an upper lid for closing an open end of the external protective sheath; said sealing plug and said upper lid each being provided with at least one opening for allowing entry of a detonating cord which is connected to the detonator and said detonating cord extending out of the insulating container.

5,589,658

SABOT WITH CONTROLLED SEPARATION OF THE ELEMENTS FOR SUBCALIBER PROJECTILES

Jean-Claude Sauvestre, 64 rue de la Vallée, 18230 Saint-Doulchard, France

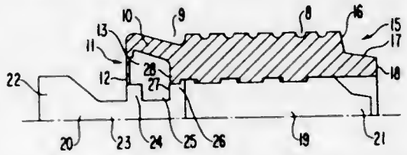
PCT No. PCT/FR94/00984, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO95/04913, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 5, 1994, Ser. No. 411,661

Claims priority, application France, Aug. 6, 1993, 93 09708

Int. Cl.[6] F42B *14/06*

U.S. Cl. 102—521 **13 Claims**



1. A sabot for encasing a subprojectile in an ammunition casing holding a propellant charge, and wherein the sabot separates into multi-pieces upon being discharged out of a firearm, comprising:

a main body having a leading end and a trailing end;

an elongated external wall extending from the trailing end, wherein an external channel is formed between the external wall and the trailing end of the main body to enable the external wall to be flexible and wherein the external wall is adapted to contact an inner wall of the casing;

a partition wall extending inwardly from the elongated external wall, substantially perpendicularly to the main body,

wherein the elongated wall, the partition wall and an outer surface of the subprojectile form an internal annular chamber, the partition wall separating the internal annular chamber from the propellant charge, and wherein the elongated external wall and the external channel form an external chamber, the elongated wall separating the inner and outer chambers, and

wherein the partition wall is breakable upon igniting the propellant charge to trap gases produced therein, which gases cause separation of the sabot upon being discharged.

5,589,659

CONTROL OVER EXCESS COATING COMPOSITION IN COATING DEVICE FOR TRAVELING PAPER WEB

Martin Kustermann, Heidenheim; Ingo Gottwald, Steinheim, and Manfred Ueberschär, Nattheim, all of Germany, assignors to J.M. Voith GmbH, Germany

Filed Sep. 10, 1993, Ser. No. 119,963

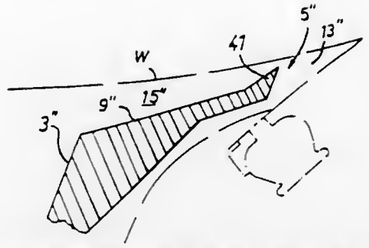
Claims priority, application Germany, Sep. 10, 1992, 42 30 276.5

Int. Cl.[6] B05C *3/02*

U.S. Cl. 118—413 **22 Claims**

1. A device for the predosing of coating composition on a web of material traveling past the device along a path of travel in a predetermined direction of travel, comprising

a doctor element;



a coating material guide member having a first side, an opposite second side and a tip, the guide member being structured and arranged to extend from a location away from the web toward the web such that the first side faces generally toward the web, the opposite second side generally faces away from the web and the tip of the guide member extends generally parallel to the doctor element across the web for defining a slot between the tip of the guide member and the web;

means for supporting the doctor element in engagement with the web at a location along the path of travel of the web; the guide member being spaced from the doctor element with the means supporting the doctor element for defining a feed channel for coating composition between the doctor element and the opposite second side of the guide member;

means for feeding the coating composition along the feed channel and toward the web; the means for feeding coating composition and the distance between the tip of the guide member and the doctor element being coordinated to define a pressure space for the coating composition between the opposite second side of the guide member and the doctor element;

the first side of the guide member being so shaped and oriented as to define a return channel and a discharge channel for excess coating composition which has moved out of the pressure space past the slot at the tip of the guide member and over the first side of the guide member, the discharge channel being defined between the first side of the guide member and a support member, and the first side of the guide member and the discharge channel being so shaped as to define a pressure reduction space for the excess coating composition in which substantially no back pressure is extended on the excess coating composition, the width of the discharge channel being at least 1.7 times the minimum width of the feed channel.

5,589,660

ENHANCED PERFORMANCE BLASTING AGENT

Robert W. Perry, Morgan Hill, and Forrest R. Goodson, San Jose, both of Calif., assignors to United Technologies Corportion, Hartford, Conn.

Filed Aug. 3, 1995, Ser. No. 510,751

Int. Cl.[6] C06B *45/06*

U.S. Cl. 149—18 **7 Claims**

1. A composition for quarry blasting comprising from about 13 to 15 weight percent of wax, from about 15 to 25 weight percent of aluminum powder, from about 10 to 52 weight percent sodium perchlorate and from about 10 to 52 weight percent ammonium nitrate, all weights being based on the total weight of the composition.

6. A blasting system comprising a mixture of two components, the first component being ANFO, and the second component being a composition comprising from about 13 to 15 weight percent of wax, from about 15 to 25 weight percent of aluminum powder, from about 10 to 52 weight percent sodium perchlorate and from about 10 to 52 weight percent ammonium nitrate, all weights being based on the total weight of the composition, wherein the weight ratio of the first component to the second component is from about 70/30 to 30/70.

5,589,661

SOLID PROPELLANT BASED ON PHASE-STABILIZED AMMONIUM NITRATE

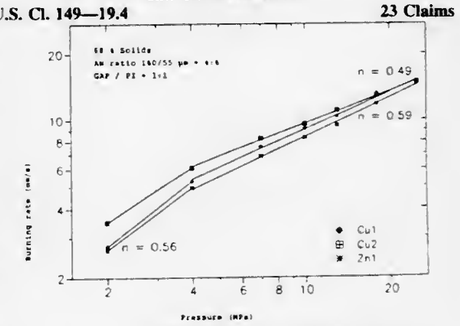
Klaus Menke, Bruchsal; Jutta Böhnlein-Mauss, Speyer; Helmut Schmid; Klaus M. Bucerius, both of Karlsruhe, and Walther Engel, Wöschbach, all of Germany, assignors to Fraunhofer-Gesselschaft zur Forderung der angewandten Forschung e.V., Munich, Germany

Filed Sep. 29, 1995, Ser. No. 536,640

Claims priority, application Germany, Oct. 5, 1994, 44 35 523.8

Int. Cl.[6] C06B *45/10*

U.S. Cl. 149—19.4 **23 Claims**



Burning behaviour of Cu-PSAN and Zn-PSAN/GAP-propellants with V/Mo-Oxid as burning catalysts

1. Solid propellant for rocket propulsion systems or gas generators, comprising 35 to 80 wt. % ammonium nitrate (AN) with an average particle size of 5 to 200 μm, which is phase-stabilized (PSAN) by chemical reaction with Cu0 or Zn0, 15 to 50 wt. % of a binder system of a binder polymer and an energy-rich plasticizer, as well as 0.2 to 5.0 wt. % of a burning moderator of vanadium oxide/molybdenum oxide as an oxide mixture or mixed oxide.

5,589,662

PYROTECHNIC MIXTURE AND GAS GENERATOR FOR AN AIRBAG

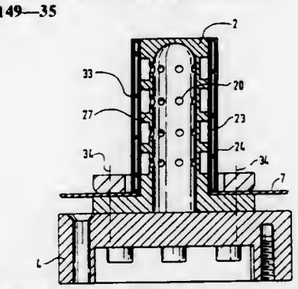
Ulrich Schleicher, Hersbruck; Martin Klober, Heideck; Wolfgang Schwarz, Nuremberg, and Eugen Feuerstake, Erlangen, all of Germany, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 125,029, Sep. 21, 1993. This application Jun. 7, 1995, Ser. No. 475,673

Claims priority, application Germany, Sep. 21, 1992, 42 31 521.2; Apr. 2, 1993, 43 10 853.9

Int. Cl.[6] C06B *35/00;21/00*

U.S. Cl. 149—35 **25 Claims**



1. Gas-generator, particularly for an airbag, comprising as a propellant charge a pyrotechnic mixture in the form of granulates comprising a nitrogen-generating substance, an inorganic oxidizing agent and as a binder silicone rubber, wherein said nitrogen-generating substance is an alkaline metal azide, an alkaline earth metal azide or an ammonium azide, characterized in that said mixture contains granulates each comprising a plurality of particles

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of the nitrogen-generating substance and the inorganic oxidizing agent having a size of from 1 μm to 200μm, which are bonded together by said binder, which is present in an amount of 13 to 28%, based on the weight of the total mixture.

5,589,663

EARTHED CABLE GLAND

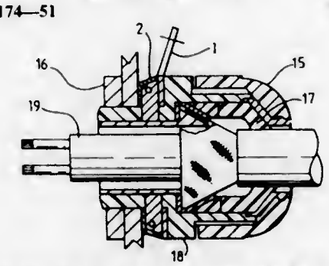
Alan C. D. Wales, Newcastle upon Tyne, United Kingdom, assignor to Elkay Electrical Manufacturing Company Limited, Newtown, United Kingdom

Filed Dec. 22, 1993, Ser. No. 171,651

Claims priority, application United Kingdom, Dec. 23, 1992, 9226789

Int. Cl.[6] H02G *15/04*

U.S. Cl. 174—51 **9 Claims**



1. An earthed cable gland for an armoured cable for mounting on an enclosure wall comprising:

an electrically insulating gland nut;

an electrically insulating tubular entry member, threaded at one end for engagement with the gland nut, and with at least one slot extending longitudinally from an other end of the entry member along a part of its length;

means for mounting the entry member on an enclosure wall;

an electrically conducting tubular connection member retained within the entry member and for engagement with an armour covering of a cable extending through said cable gland;

an electrically conducting contact member located within the at least one slot in the entry member, the contact member being moveable inwardly, when said entry member is mounted on the enclosure wall, from a first position wherein said contact member is substantially free of the connection member to a second position wherein said contact member is in abutment and electrical contact with the connection member; and

an earth tag for electrical contact with the contact member.

5,589,664

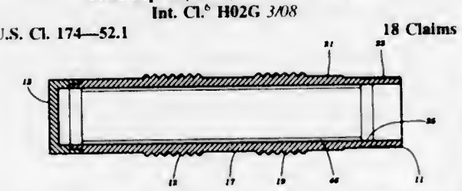
APPARATUS FOR CONTAINING ELECTRICAL COMPONENTS FOR SENSING OR MEASURING MAGNETIC FIELDS

John E. Rode, Fonda, N.Y., assignor to Temper Corporation, Fonda, N.Y.

Filed Sep. 21, 1993, Ser. No. 124,818

Int. Cl.[6] H02G *3/08*

U.S. Cl. 174—52.1 **18 Claims**



1. An apparatus for containing electric components for sensing or measuring magnetic fields comprising:

a tubular member made of a ferrous metal, said tubular member being capable of receiving electrical components for measuring magnetic fields therein;

a cap affixed to one end of the tubular member, said cap being made of a non-ferrous metal;

means for mounting said tubular member into a housing wherein said cap is within said housing.

5,589,665

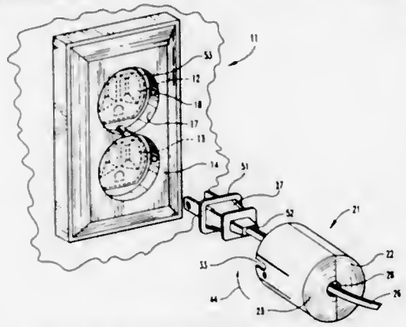
CHILD-RESISTANT ELECTRICAL OUTLET COVER

Randal Scamacca, 222 Deer Park Ct., Seymour, Ind. 47274

Filed Jun. 7, 1994, Ser. No. 254,953

Int. Cl.[6] H02G *3/14;* **H05K** *5/03*

U.S. Cl. 174—67 **13 Claims**



1. An electrical outlet shield apparatus comprising:

a face plate having a front and a back and an opening through the back for reception therein of a socket boss of a wall-mounted electrical socket assembly,

the face plate having a recess associated with the opening, the recess having a wall extending outwardly from the opening to the front of the plate;

a pair of anchor pins projecting from the wall of the recess toward the center of the recess;

a covering cup having an open end for reception in the recess, and the cup having a closed end,

the cup having a first slot intercepting the open end and a second slot intercepting the open end and an aperture spaced from a closed end of the second slot,

the spacing of the slots at the open end corresponding to the spacing of the pins so that the cup can be installed on the pins by advancing the open end of the cup straight into the recess with open ends of the slots in registry with the pins,

the cup having a wall portion between the second slot and the aperture and which, by abuttingly engaging one of the pins that is in the second slot, normally prevents turning the cup in the recess,

the wall portion being manually deflectable inwardly to clear that wall portion from the abuttingly engaging relationship with the one pin while the cup is in the recess to enable turning the cup to place the aperture in registry with the one pin,

the wall portion being resiliently restorable to non-deflected condition for reception of the aperture around the one pin to secure the cup in the recess.

5,589,666

ENCLOSURE FOR SEALING A SPLICE OF ELECTRICAL CABLES

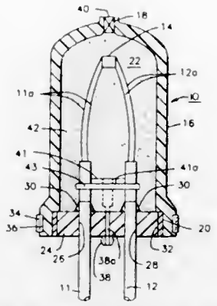
David J. DeCarlo, Toms River; Thomas L. Mineur, High Bridge, and Ronald S. Stanwick, Belvidere, all of N.J., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Continuation-in-part of Ser. No. 776,139, Oct. 15, 1991, Pat. No. 5,251,373. This application Apr. 30, 1993, Ser. No. 55,494

Int. Cl.[6] H02G *15/06*

U.S. Cl. 174—87 **19 Claims**

1. An enclosure for sealing a splice of electrical cables comprising:



a closure defining an interior space for accommodating a splice of cables and defining an opening for receipt of said splice therethrough;

a closure seal for sealably closing said closure opening and having one or more apertures for receipt therethrough of said cables;

means for sealing said closure seal to said closure and for sealing said cables to said closure seal at said one or more apertures;

an inlet fitting extending into and communicating with said interior space, said inlet fitting adapted to receive and pass an encapsulant under pressure therethrough into said interior space; and

an outlet fitting extending into and communicating with said interior space, said outlet fitting adapted to pass said encapsulant therethrough when said encapsulant is exposed to a predetermined pressure in said interior space.

5,589,667

REMOVABLE CORE FOR PRE-STRETCHED TUBE

Tomio Tsukazaki, Machida, and Tsunehisa Nakamura, Tokyo, both of Japan, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

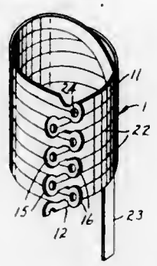
PCT No. PCT/US93/03139, § 371 Date Sep. 14, 1994, § 102(e) Date Sep. 14, 1994, PCT Pub. No. WO93/22816, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 2, 1993, Ser. No. 302,821

Claims priority, application Japan, Apr. 28, 1992, 4-109374; May 8, 1992, 4-116249

Int. Cl.[6] H01B *7/00*

U.S. Cl. 174—135 **8 Claims**



1. A removable core for supporting a pre-stretched elastomeric tube in a radially-expanded condition comprising:

a flexible sheet having opposite edges which include means for interlocking said opposite edges to maintain said sheet in a cylinder;

said sheet having a series of substantially parallel lines of localized weakening extending from one of said opposite edges to a point near but short of the other of said opposite edges, with successive lines extending from alternate edges of said sheet to define a strip beginning at a free end and continuing in a serpentine length between and around consecutive lines;

so that pulling said free end will cause said strip to separate along said lines and permit said core to be removed from said tube without coiling of said strip.

5,589,668

MULTI-METAL LAYER WIRING TAB TAPE CARRIER AND PROCESS FOR FABRICATING THE SAME

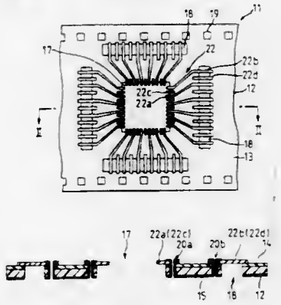
Kenji Yamaguchi; Shoji Takagi; Sadahiko Mitsugi; Mamoru Mita, and Tomio Murakami, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Nov. 10, 1993, Ser. No. 149,795

Claims priority, application Japan, May 12, 1993, 5-110476

Int. Cl.[6] H05K *1/14*

U.S. Cl. 174—266 **23 Claims**



1. A multi-metal layer wiring TAB tape carrier, comprising:

a plurality of conductive metal layers forming a wiring pattern of said TAB tape carrier;

at least one dielectric layer interposed between said conductive metal layers for electrically isolating said conductive metal layers from each other, a first conductive metal layer, of the plurality of conductive metal layers, being on a first side of said at least one dielectric layer, and a second conductive metal layer, of the plurality of conductive metal layers, being on an opposed side of the at least one dielectric layer, said at least one dielectric layer having connection holes therethrough; and

a conductive via layer formed in said connection holes, so as to electrically connect said first conductive metal layer to said second conductive metal layer through said at least one dielectric layer, by way of said conductive via layer,

wherein said conductive via layer and one of the first and second conductive metal layers are codeposited layers formed by vapor deposition, and wherein said conductive via layer and said one of the first and second conductive metal layers are a continuous integral layer.

5,589,669

ELECTRICAL CONTACT FOR PRINTED CIRCUIT BOARDS

Stuart D. Downes, Milford, and Leonard A. Merrill, Millis, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Dec. 28, 1995, Ser. No. 579,773

Int. Cl.[6] H05K *1/02*

U.S. Cl. 174—266 **17 Claims**

1. An electrical contact for mounting on a printed circuit board that has a plated-through hole, the contact comprising:

a conductive pin; and

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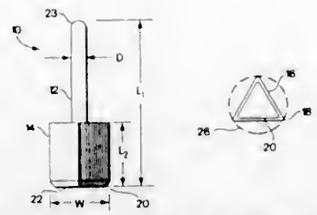


a base attached to one end of the pin, the base having a triangular cross-section with three sides and three vertices, the base constricted and arranged to be mounted in a plated-through hole on a printed circuit board.

5,589,670

WEIGHING APPARATUS AND METHOD USING VARIABLE KEY BAR MEANS

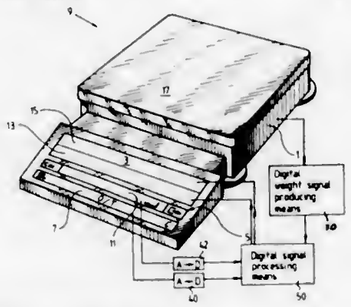
Urs Berli, Bauma, Switzerland, assignor to Mettler-Toledo AG, Greifensee, Switzerland

Filed Jan. 24, 1994, Ser. No. 185,259

Claims priority, application Switzerland, Feb. 26, 1993, 589/93

Int. Cl.[6] **G01G** *19/22*

U.S. Cl. 177—25.13 **5 Claims**



1. Weighing apparatus comprising:

(a) a scale housing (**1**) including load responsive means (**17**);

(b) means (**30**) for producing a digital weight signal as a function of a load applied to said load-responsive means;

(c) digital signal processing means (**50**) for processing the digital weight signal in accordance with selected ones of a plurality of weighing parameters stored in a memory to produce a desired result;

(d) display means (**13,15**) controlled by the digital signal processing means for displaying:

(1) selected ones of the plurality of weighing parameters, and

(2) said desired result; and

(e) variable keyboard means including:

(1) a first tare bar key (**7**) for taring said digital weight signal producing means and said display means; and

(2) a second parameter bar key (**11**) for selecting weighing parameters and programs indicated in said display, said second bar key including a plurality of variable switching portions of variable length longitudinally of said parameter bar key, resectively.

5,589,671

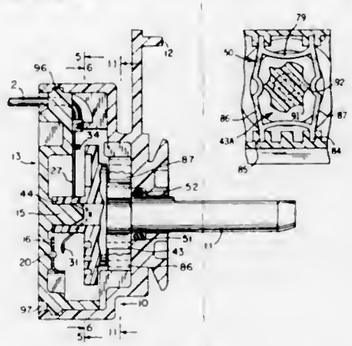
ROTARY SWITCH WITH SPRING STABILIZED CONTACT CONTROL ROTOR

David G. Hackbarth, New Berlin, Wis.; Kenyon A. Hapke, Libertyville, Ill., and Spencer C. Schantz, Dousman, Wis., assignors to US Controls Corp., New Berlin, Wis.

Filed Aug. 22, 1995, Ser. No. 518,108

Int. Cl.[6] **H01H** *19/60;21/80;* **G05G** *5/06*

U.S. Cl. 200—6 R **17 Claims**



1. A rotary switch comprising:

a base member and a housing for enclosing the base member,

a plurality of electrical switch contacts mounted to said base member,

a rotor including a shaft journaled for rotation in said housing and means on said shaft for operating said switch contacts in response to rotation of said shaft, and including an index wheel mounted to the shaft coaxially therewith,

said index wheel having circumferentially spaced apart radially outwardly extending teeth defined by curved radially inwardly depressed recesses between said teeth,

a plastic spring operatively engaged with said index wheel to control said rotor to turn in discrete angular steps when said shaft is turned,

said spring is comprised of two longitudinally extending laterally spaced apart deflectable legs having opposite free end portions and struts spanning laterally between said legs and joined with said legs, respectively, near said opposite free end portions, each of said legs having a detent formed therein intermediate of said free end portions, said detents being convex and registered in said recesses of said index wheel when said rotor has turned one step,

said housing having pairs of laterally spaced apart slots with said pairs of slots longitudinally spaced apart to provide for inserting in said pairs of slots said free end portions of said legs of said spring and,

said end portions of said legs being constrained in said slots to prevent said legs from moving longitudinally by any amount when said legs are deflected by said detents thereon passing over said tips of said index wheel teeth when said rotor is turned.

5,589,672

CIRCUIT BREAKER WITH ARC QUENCHING DEVICE AND VENT

Naoshi Uchida; Masao Miura; Jun Oyama; Katsunori Kuboyama, and Koji Asakawa, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

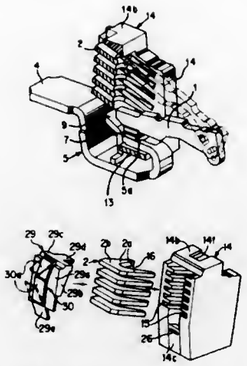
Filed Jun. 7, 1995, Ser. No. 477,822

Claims priority, application Japan, Jun. 14, 1994, 6-155332; Dec. 20, 1994, 6-334792

Int. Cl.[6] **H01H** *9/36;33/04*

U.S. Cl. 218—34 **11 Claims**

1. A circuit breaker comprising:



a stationary contact member bent back into a U-shape and having a stationary contact at a bent back portion thereof;

a U-shaped magnetic driving core disposed at the bent back portion of the stationary contact member and having arms extending upwardly from the bent back portion;

a moving contact member situated adjacent to the stationary contact member to be able to contact with the stationary contact;

a plurality of grids laminated vertically with a space therebetween and situated adjacent to the stationary contact member to surround the same; and

a unitary molded insulator situated around the stationary and moving contact members, said insulator including a pair of side walls facing to each other, each side wall having a hollow part extending upwardly from a lower end thereof, and a plurality of slots arranged in the opposed side walls to vertically space apart from each other so that when the circuit breaker is assembled, the side walls are located to sandwich the stationary and moving contact members while the arms of the magnetic driving core are located in the hollow parts of the side walls, and the grids are inserted into the slots and vertically piled together.

5,589,673

ELECTRIC HIGH-TENSION CIRCUIT BREAKER

Volker Lehmann; Heiner Marin, and Ingolf Reiher, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

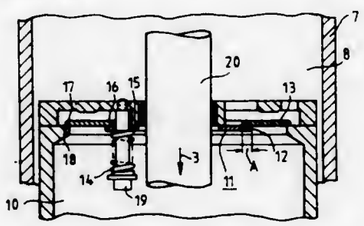
PCT No. PCT/DE93/00129, § 371 Date May 15, 1995, § 102(e) Date May 15, 1995, PCT Pub. No. WO93/20573, PCT Pub. Date Oct. 14, 1993

PCT Filed Feb. 9, 1993, Ser. No. 313,086

Claims priority, application Germany, Mar. 31, 1992, 42 11 159.5

Int. Cl.[6] **H01H** *33/86*

U.S. Cl. 218—66 **10 Claims**



1. A high-tension circuit breaker with a separating gap and having self-generated quenching gas flow comprising:

a compression device for blow-out of electric arcs, the compression device including:

a compression space delimited by an inner wall of the compression device and by a piston;

a pressure chamber heatable by the arc energy, adjacent to the separating gap and connected to said compression space of the compression device;

a piston for insertion into an open end of the compression device, the piston including:

a low-pressure space delimited by an inner wall of the piston; and

a valve device located on the piston, between the compression space and the low-pressure space, the valve device comprising first and second concentric washers in contact with one another, the second washer having an outer diameter greater than an outer diameter of the first washer and an inner diameter greater than an inner diameter of the first washer and smaller than an outer diameter of the first washer,

wherein the valve device acts as a refill valve by allowing the compression space to be refilled with gas from the low-pressure space and as a relief valve by allowing gas under pressure to pass from the compression space to the low-pressure space.

5,589,674

METAL-ENCAPSULATED, GAS-INSULATED SWITCHING INSTALLATION

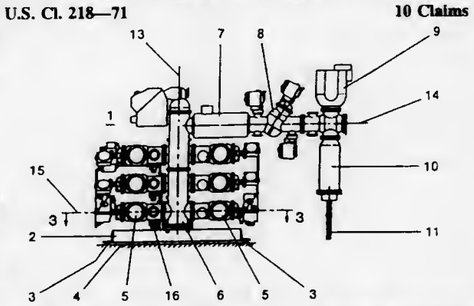
Ernst Berger, Mellingen; Franz Heil, Baden-Rütihof; Herbert Schifko, Glattbrugg, and Piero Tecchio, Oberrohrdorf, all of Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 29, 1995, Ser. No. 412,926

Claims priority, application Switzerland, Apr. 19, 1994, 1218/94

Int. Cl.[6] **H02B** *13/035;* **H01H** *33/70*

U.S. Cl. 218—71 **10 Claims**



1. A single-phase, metal-encapsulated, gas-insulated switching installation, the modular circuit breaker pole comprising:

a modular circuit breaker pole, the modular circuit breaker pole including

an enclosure lower part having a first end and a second end, and at least one opening for connecting an isolator for a busbar system between the first end and the second end of the enclosure lower part,

an enclosure upper part having a first end and a second end, at least one of the first end and the second end of the enclosure upper part being attachable to either of the first end and the second end of the enclosure lower part,

an enclosure cover attachable to either of the second end and the first end of the enclosure upper part;

the enclosure lower part, the enclosure upper part, and the enclosure cover defining at least part of a circuit breaker pole enclosure having a pole axis, and

a quenching chamber disposed inside of the pole enclosure and electrically connectable to the isolator through the opening in the enclosure lower part.

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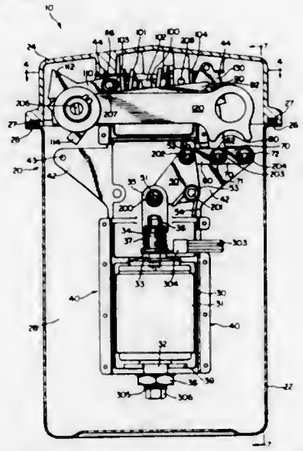
VACUUM SWITCH

Nole L. Walters, Granger, Ind.; Edward A. Raleigh, Madison, Wis., and Peter H. Thiel, Bloomington, Ind., assignors to Trinetics, Inc., Mishawaka, Ind.

Filed Apr. 8, 1994, Ser. No. 224,819
Int. Cl.[6] H01H *33/02;33/66*
U.S. Cl. 218—140 **22 Claims**



1. A mechanism for opening and closing the contacts of a vacuum switch, comprising:

a drive link coupled to a movable contact of the vacuum bottle;

a first toggle link coupled to said drive link;

a drop link coupled to said first toggle link and to a lever;

a cam rotatably coupled to said lever for imparting motion to said lever;

a handle coupled to said cam for rotating said cam;

an over-center spring assembly coupled to said cam for resisting movement of the movable contact until a predetermined level of force is stored in said spring assembly;

a clevis attached to the movable contact; and

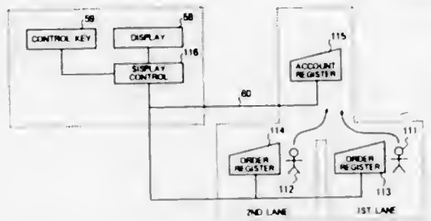
a pin extending through the arms of said clevis and said drive link.

5,589,676

ELECTRONIC CASH REGISTER SYSTEM

Kesayoshi Iguchi, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 21, 1995, Ser. No. 407,627
Claims priority, application Japan, May 27, 1994, 6-115423
Int. Cl.[6] G07G *1/00*
U.S. Cl. 235—7 R **4 Claims**



1. An electronic cash register system comprising:

a plurality of order registers each having a register number and for receiving content of orders;

a display unit for displaying the content of orders received by said plurality of order registers;

a display control unit having an internal memory, for controlling display on said display unit and successively storing in said internal memory a plurality of said content of orders received by said plurality of order registers in association with the register number of the one of said plurality of order registers which received one of said plurality of content of orders; and

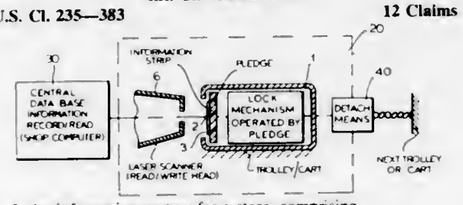
a plurality of account registers each associated with at least one of said plurality of order registers and having its own register number corresponding to that of said at least one of said plurality of order registers and for reading out the content of orders from the internal memory of said display control unit on the basis of said own register number and then accounting for the read-out content of orders.

5,589,677

PLEDGE LOCK FOR A SHOPPING TROLLEY

Horst Merchel, Bietigheim-Bissingen, Germany, assignor to Vendoret Holding S. A., Luxembourg-Hesperange, Luxembourg

Continuation of Ser. No. 254,293, Jun. 6, 1994, abandoned.
This application Mar. 28, 1996, Ser. No. 623,983
Claims priority, application Germany, Jun. 4, 1993, 43 18 627.0; Dec. 8, 1993, 43 41 791.4
Int. Cl.[6] G06K *15/00*
U.S. Cl. 235—383 **12 Claims**



1. An information system for a store, comprising

a plurality of interlockable shopping trolleys, each of said trolleys being provided with a respective pledge lock securing a locked position of the trolley;

detaching means on each of the trolleys cooperating with the pledge lock for removably enabling release of the respective trolley;

means on each of the locks forming a respective opening;

an information carrier forming a pledge and carrying shopper information for a customer and removably inserted in the respective opening to unlock the pledge lock, said information carrier being retained in the unlocked pledge lock;

central information database means for storing information derived from and applicable to the respective carrier; and

means separate from the pledge lock in the store and forming part of the central information database means for scanning the respective carrier while it is retained in the pledge lock for communication of information between the central information database means and the respective information carrier.

5,589,678

SCANNER OF A BAR CODE VERIFIER

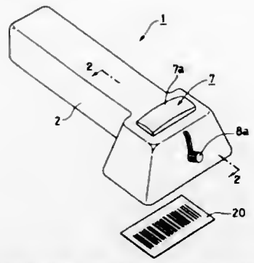
Toru Atsumi; Yasuhiro Kamijo, both of Kariya; Yoshiki Furukawa, and Naoki Matumura, both of Hadano, all of Japan, assignors to Nippon Denso Co. Ltd., and Stanley Electric Co. Ltd., both of Aichi-ken, Japan

Filed Sep. 21, 1995, Ser. No. 531,469
Claims priority, application Japan, Sep. 22, 1994, 6-254630
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—472 **9 Claims**

1. A scanner for reading a bar code comprising:

a light source for irradiating a bar code with rays of light;

a sensor device for receiving rays of light reflected by said bar code;



a case for housing said light source and said sensor device;

characterized in that

said case is provided with an opening for allowing said reflected rays of light to enter the case arranged at a position to be placed vis-a-vis said bar code;

a viewing window for allowing the operator of the scanner to confirm the alignment of said bar code and said opening; and

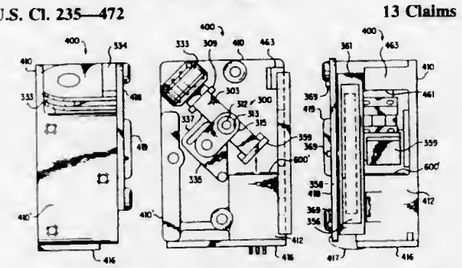
a blind shutter for closing said viewing window, to block external light from entering the scanner.

5,589,679

PARALLELEPIPED-SHAPED OPTICAL SCANNING MODULE

Paul Dvorkis, Stony Brook, and Howard Shepard, Great River, both of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation of Ser. No. 237,531, May 3, 1994, Pat. No. 5,479,000, which is a continuation-in-part of Ser. No. 789,705, Nov. 8, 1991, Pat. No. 5,412,198, which is a continuation-in-part of Ser. No. 520,464, May 8, 1990, Pat. No. 5,168,149, which is a continuation-in-part of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110. This application Dec. 19, 1995, Ser. No. 575,662
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—472 **13 Claims**



1. An optical scanning module including a light emitter for emitting a light beam and a detector for receiving light reflected back from indicia with portions of differing light reflectivity and producing an electrical signal corresponding to the differing light reflectivity of the indicia, comprising:

a first circuit board carrying a first circuit forming at least a portion of a first side of said module;

a second circuit board carrying a second circuit forming at least a portion of at least a portion of a second side of said module;

a base forming at least a portion of a third side of said module; said first and second circuits being electrically connected to each other; and

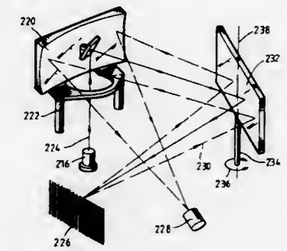
said optical scanning module being in the shape of a rectangular parallelepiped.

5,589,680

PORTABLE LASER DIODE SCANNING HEAD

Jerome Swartz, Old Field; Howard M. Shepard, Great River; Mark J. Krichever, Hauppauge; Boris Metlitsky, Stony Brook, and Edward Barkan, Setauket, all of N.Y., assignors to Symbol Technologies, Holtsville, N.Y.

Continuation of Ser. No. 163,580, Dec. 7, 1993, abandoned, which is a continuation of Ser. No. 784,619, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 562,037, Aug. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 454,144, Dec. 21, 1989, Pat. No. 5,021,641, which is a division of Ser. No. 295,151, Jan. 9, 1989, Pat. No. 4,897,532, which is a division of Ser. No. 148,669, Jan. 26, 1988, Pat. No. 4,825,057, which is a division of Ser. No. 706,502, Feb. 28, 1985, abandoned. This application Feb. 22, 1996, Ser. No. 604,858
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—472 **8 Claims**



1. A method for reading indicia such as bar code symbols, comprising the steps of:

generating a laser light beam utilizing a laser light source;

reflecting the generated light beam to a moving scanning mirror utilizing a stationary folding mirror;

reflecting the light beam from said scanning mirror to form a scanning pattern in a field located outside the scanning apparatus; at least a portion of the light received by the field and reflected from indicia in the field being returned back to the scanning mirror;

reflecting said returned light by the scanning mirror to a concave stationary collecting mirror, wherein the collecting mirror is larger than the folding mirror and the folding mirror is mounted in front of the surface of the collecting mirror near the line central portion of the surface of said collecting mirror; and

reflecting said returned light by said collecting mirror to a light sensor for detecting the variable intensity of the reflected light over a field of view, and for generating an electrical signal indicative of the variable light intensity.

5,589,681

CARD RECEIVER ENABLING A BROKEN CARD TO BE EJECTED AND CARD READER USING IT

Bruno Merlin, Argenteuil, and Jean Quintana, Cergy, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, France

PCT No. PCT/FR93/00533, § 371 Date Jan. 26, 1995, § 102(e) Date Jan. 26, 1995, PCT Pub. No. WO93/25977, PCT Pub. Date Dec. 23, 1993
PCT Filed Jun. 4, 1993, Ser. No. 351,238
Claims priority, application France, Jun. 4, 1992, 92 06781
Int. Cl.[6] G06K *13/00*
U.S. Cl. 235—482 **11 Claims**

1. Information-bearing-card receiver (1), including an insertion slot (4) made between two lips (5, 5A), with a bearing lip (5) being one of the two lips, means (6, 17P) for bending the card (3) which are arranged, in the direction of insertion of the card (3), beyond this bearing lip (5), means (11) for guiding the front edge (3A) of

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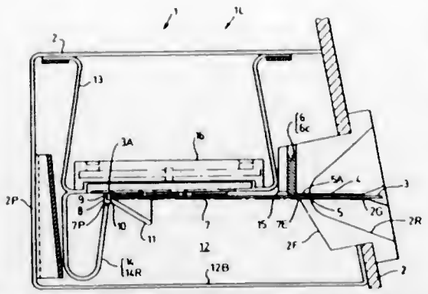


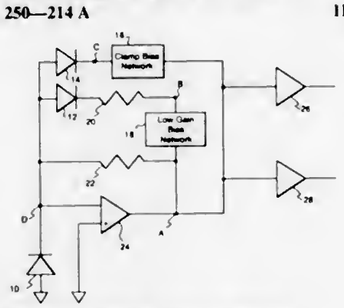
the said card (3) in order to bring the card (3) into a read position in which the card is capable of being, read when the card is fully inserted, and means (8) for receiving, in the read position, the front edge (3A) of the card (3), which include a limit-stop wall (9) constructed so as to be moved in the direction of insertion of the card (3) under the action of a thrust by the card (3) and against the action of first return means (13), characterized by the fact that the bending means (6, 17P) are arranged for acting in the direction of the bearing lip (5) and against the action of the guiding means (11) and for laterally ejecting the card (3) out of its introduction path when is out of reach of the bearing lip (5).

5,589,682

PHOTOCURRENT DETECTOR CIRCUIT WITH HIGH SENSITIVITY, FAST RESPONSE TIME, AND LARGE DYNAMIC RANGE

Dale M. Brown, Schenectady, and Gerald J. Michon, Waterford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1995, Ser. No. 474,238
Int. Cl.[6] H01J *40/14;* **H03F** *17/00;* **G01J** *5/28*
U.S. Cl. 250—214 A **11 Claims**



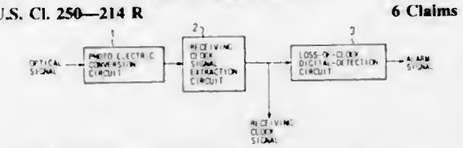
1. A photocurrent detector circuit comprising:
a photodetector;
an operational amplifier, the photodetector being coupled to an input terminal of the operational amplifier;
a first resistor being coupled between the photodetector and an output terminal of the operational amplifier;
a first diode;
a second resistor, the first diode being coupled between the photodetector and the second resistor;
a low gain bias network being coupled between the second resistor and the output terminal of the operational amplifier;
a second diode being coupled to the photodetector; and
a clamp bias network being coupled between the second diode and the output terminal of the operational amplifier.

5,589,683

OPTICAL RECEIVER APPARATUS FOR QUICKLY DETECTING LOSS OF A COMPOSITE OPTICAL SIGNAL INPUT EMPLOYING A LOSS-OF-CLOCK DETECTOR

Yukako Nakai, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 19, 1994, Ser. No. 308,587
Claims priority, application Japan, Sep. 20, 1993, 5-233102
Int. Cl.[6] H01J *40/14*
U.S. Cl. 250—214 R **6 Claims**



1. An optical signal receiver apparatus comprising:
a photoelectric conversion circuit for receiving an optical signal conveying cyclic timing information, and converting the optical signal into an electrical signal conveying the cyclic timing information;
a receiving clock signal extraction circuit for extracting a receiving cock signal indicating the cyclic timing information, from the electrical signal; and
a loss-of-clock digital-detection circuit for detecting absence of a change in a digital level of the receiving clock signal, wherein said loss-of-clock digital-detection circuit comprises a latch circuit for latching a predetermined constant electric level cyclically in synchronization with the digital level change in the receiving clock signal, and being reset by receiving a cyclic reset signal having a frequency less than the frequency of the receiving clock signal, the time required to detect loss of clock being determined by the frequency of said reset signal.

5,589,684

MULTIPLE DIODE LASERS STABILIZED WITH A FIBER GRATING

Brian F. Ventrudo, Victoria, and Peter G. Berrang, Sidney, both of Canada, assignors to SDL, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 267,785, Jun. 28, 1994, Pat. No. 5,485,481. This application Mar. 30, 1995, Ser. No. 415,129
Int. Cl.[6] G02F *1/01*
U.S. Cl. 250—225 **30 Claims**

1. Apparatus for generating a stable source of optical radiation comprising:
two mutually incoherent diode lasers that emit linearly polarized light beams substantially in a single spatial mode and that include a diode laser cavity including an output facet having substantially broadband reflectivity capable of generating multiple longitudinal modes within the laser cavity in the absence of external optical feedbacks, said beams comprising mutually incoherent beams of substantially orthogonal polarizations;
a polarizing beam combiner to receive said beams of substantially orthogonal polarizations and combine them into a single, substantially unpolarized beam of light, while adding the optical power of said beams;

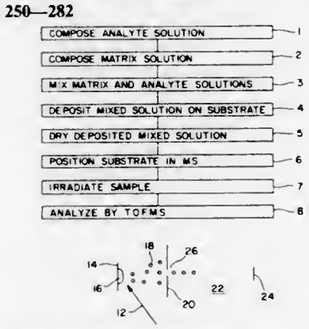
first means for directing the orthogonally polarized emission of each diode laser into the polarizing beam combiner while maintaining the polarization state of each diode laser such that the light beams from each laser exiting the beam combiner are substantially overlapped and co-propagating;
an optical fiber which includes a guided-wave region that is capable of sustaining at lease one mode of wavelength of the diode laser;
second means for directing the combined light of the diode lasers into the guided-mode region of the optical fiber;
a narrow-bandwidth reflector formed in the guided mode region of the optical fiber.

5,589,685

MATRIX ENHANCED SIMS

Kuang Jen Wu, 2705 Alma St., and Robert W. Odom, 2068 Harvard St., both of Palo Alto, Calif. 94306

Filed May 26, 1995, Ser. No. 451,257
Int. Cl.[6] H01J *49/90*
U.S. Cl. 250—282 **25 Claims**



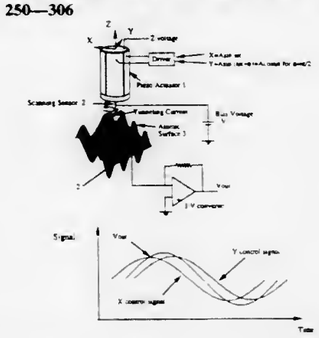
1. A method for measuring any one of:
(i) a spatial distribution of a plurality of analyte particulates;
(ii) a difference in masses of each of said plurality of analyte particulates;
(iii) a mass of each of said analyte;
which includes the steps in operable order:
(a) providing a mass spectrometer constructed to project an energetic primary beam on a target surface of said mass spectrometer and to impose an accelerating field between said target surface and an accelerating electrode wherein said primary beam is one of:
(i) an electron beam;
(ii) a negative ion beam;
(iii) a positive ion beam; and
(iv) neutral beam;
(b) mixing a quantity of an analyte component in a quantity of a matrix forming compound such as to form a sample wherein said matrix forming compound is one of an acid and a base selected to enhance ionization efficiency;
(c) depositing said sample on a substrate;
(d) positioning said substrate on said target surface;
(e) projecting said primary beam onto said sample such as to sputter said analyte particulates from said sample;
(f) directing said sputtered analyte particulates toward said accelerating electrode in an extraction field then into a drift region to a detector; and
(g) measuring the mass-to-charge ratio of analyte said particulates by said mass spectrometer.

5,589,686

METHOD OF AN APPARATUS FOR REAL-TIME NANOMETER-SCALE POSITION MEASUREMENT OF THE SENSOR OF A SCANNING TUNNELING MICROSCOPE OR OTHER SENSOR SCANNING ATOMIC OR OTHER UNDULATING SURFACES

Tetsuo Ohara, 12 Lindall Pl., #4, Boston, Mass. 02114

Continuation of Ser. No. 216,057, Mar. 22, 1994, abandoned. This application Jan. 19, 1996, Ser. No. 588,651
Int. Cl.[6] G01B *5/28;* **H01J** *37/26*
U.S. Cl. 250—306 **20 Claims**



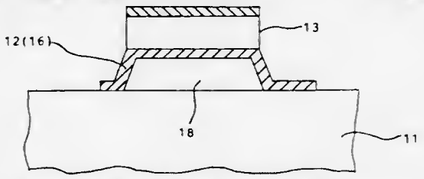
13. Apparatus for real-time nanometer position measurement of a sensor probe scanning a periodically undulating surface as the surface and the probe are relatively moved, having, in combination with said probe, means for setting up a current between the probe and the surface; means operable during said scanning for oscillating the probe about a reference origin point of the probe by a controlling sinusoidal voltage; means for measuring the output sinusoidal voltage generated by the current during said oscillating and after passing to the surface; means for comparing the phase and/or amplitude of the controlling and output voltages by means for multiplying said output sinusoidal voltage by said controlling sinusoidal voltage; and means for developing from such comparing, positional signals on a continual basis, indicative of the direction and distance of the probe off the apex of the nearest atom or undulation of the surface, and thus the position of the probe along the surface.

5,589,687

INFRARED DETECTION DEVICE COMPRISING A PYROELECTRIC THIN FILM AND METHOD FOR FABRICATING THE SAME

Satoshi Kawata; Masaji Dohi; Yoichiro Sakachi, and Hiroshi Daiku, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1995, Ser. No. 413,958
Claims priority, application Japan, Apr. 18, 1994, 6-101682
Int. Cl.[6] G01J *1/02*
U.S. Cl. 250—338.3 **11 Claims**



1. An infrared detection device comprising:
a substrate having a surface which has a plurality of mesas, each of said mesas having a hollow structure, and
a pyroelectric thin film formed on said surface having said mesas.

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5,589,688

INFRARED RADIATION SENSOR

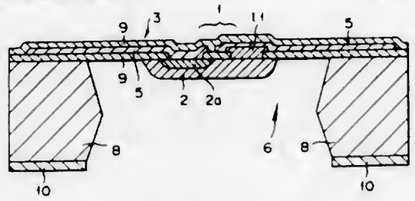
Mitsuteru Kimura, 2-56, Shiomidai 3-chome, Shichigahama-cho, Miyagi-gun, Miyagi-ken, and Takeshi Kudo, Kanagawa, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, and Mitsuteru Kimura, Miyagi-ken, both of Japan

Filed Nov. 29, 1995, Ser. No. 564,428

Claims priority, application Japan, Nov. 30, 1994, 6-296565

Int. Cl.[6] G01J *5/20*

U.S. Cl. 250—338.4 **6 Claims**



1. A heat sensitive infrared radiation sensor comprising an n type single crystal area formed in the shape of a thin film by doping a sensor substrate made of p type semiconductor with an n type impurity through the surface of said sensor substrate, a temperature sensor element formed in said n type single crystal area, a hollow part formed by removing by etching said p type semiconductor from the substantially lower and peripheral parts of said n type single crystal area as to leave said n type single crystal area of the sensor substrate, and a thermally and electrically insulating thin film bridge structure part having said n type single crystal area in the shape of a thin film provided with said temperature sensor element carried thereon, said bridge structure part formed over said hollow part and including a light receiving part.

5,589,689

INFRARED DETECTOR WITH FABRY-PEROT INTERFEROMETER

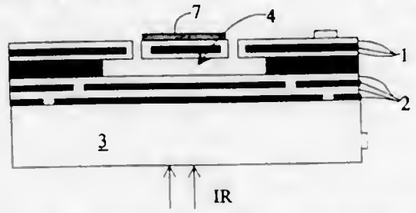
Yrjö Koskinen, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Jul. 7, 1995, Ser. No. 499,188

Claims priority, application Finland, Jul. 7, 1994, 943251

Int. Cl.[6] G01J *5/10*

U.S. Cl. 250—339.01 **20 Claims**



1. A silicon micromechanically fabricated infrared detector comprising:

an electrically tuneable Fabry-Perot interferometer having mirrors and being manufactured by silicon micromechanical techniques;

an infrared radiation absorbing layer integrally coupled with one of the mirrors;

thermal detector means for detecting the amount of radiation absorbed into said absorbing layer.

5,589,690

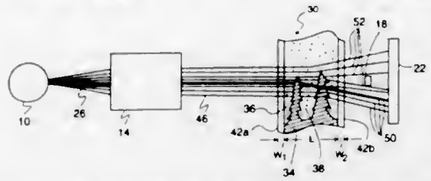
APPARATUS AND METHOD FOR MONITORING CASTING PROCESS

Thomas A. Siewert, Boulder; William P. Dubé, Denver, and Dale W. Fitting, Golden, all of Colo., assignors to National Institute of Standards and Technology, Washington, D.C.

Filed Mar. 21, 1995, Ser. No. 407,699

Int. Cl.[6] G01N *23/20*

U.S. Cl. 250—390.06 **25 Claims**



1. A method for monitoring an interface between a crystalline phase and an amorphous phase of a material within a container, comprising the steps of:

directing source radiation through at least one wall of a container and into an interface between a portion of a crystalline phase of a material and a portion of an amorphous phase of said material contained in said container to provide diffracted radiation having a first diffraction component with a first spatial radiation distribution associated with said crystalline phase and a second diffraction component with a second spatial radiation distribution associated with said amorphous phase, said first and second spatial radiation distributions being spatially distinct;

receiving at least a portion of at least one of said first diffraction component and said second diffraction component of said diffracted radiation on a radiation sensitive detector means located outside of said container to provide an output signal, said output signal including information corresponding to said spatial radiation distribution of the received portion; and

using said output signal to monitor said interface between said crystalline phase and said amorphous phase.

5,589,691

PROCESS FOR RECOVERY AND RECYCLE OF METHANESULFONIC ACID AND PHOSPHOROUS ACID

Edamanal S. Venkataramani, Woodbridge; Andrew L. Forman, Scotch Plains; Ralph J. Maglietta, Jr., Piscataway; William A. Vaughn, Avenel, all of N.J., and Richard R. Dauer, Longmont, Colo., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 6, 1994, Ser. No. 254,213

Int. Cl.[6] C09K *3/00*

U.S. Cl. 252—182.11 **13 Claims**

1. A process comprising the steps of:

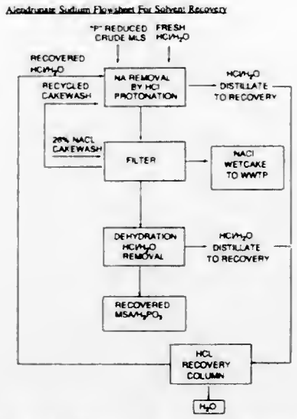
(i) contacting an aqueous medium comprised of the sodium salts of methanesulfonic acid and phosphorous acid with hydrochloric acid to obtain an HCl concentration of about 6N or above to precipitate sodium chloride;

(ii) separating sodium chloride from the aqueous medium in (i);

(iii) washing the separated sodium chloride with saturated aqueous sodium salt solution to remove residual methanesulfonic acid;

(iv) removing hydrochloric acid and water from the resulting medium in Step (iii) by atmospheric distillation;

(v) separating methanesulfonic acid and phosphorous acid from the resulting medium in Step (iv), which contains small



amounts of HCl and H_2O, by vacuum distillation to yield a dry mixture of methanesulfonic acid/phosphorous acid.

5,589,692

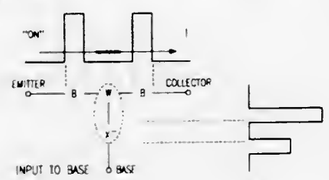
SUB-NANOSCALE ELECTRONIC SYSTEMS AND DEVICES

Mark A. Reed, New Haven, Conn., assignor to Yale University, New Haven, Conn.

Continuation of Ser. No. 893,092, Jun. 1, 1992, Pat. No. 5,475,341. This application Apr. 11, 1995, Ser. No. 421,357

Int. Cl.[6] H01L *29/06;35/24*

U.S. Cl. 257—23 **3 Claims**



1. A picoelectronic device comprising:

first and second conductor chains, each comprising multiple monomor units having mutually conjugated bonding;

a first barrier region, connected to said first conductor chain, said first barrier having a potential energy for electrons which is less favorable than that of said first conductor chain;

a second barrier region, connected to said second conductor chain, said second barrier having a potential energy for electrons which is less favorable than that of said second conductor chain;

a well region, connected to said first and second barrier regions, said well region having a potential energy for electrons which is more favorable than that of said first and second barrier regions;

a third barrier region, connected to said well region, said third barrier having a potential energy for electrons which is less favorable than that of said well;

a third conductor chain, comprising multiple monomor units having mutually conjugated bonding, and operatively connected to said well region through said third barrier region;

whereby changing potentials applied to said third chain can effect modulation of currents between said first and second chains.

5,589,693

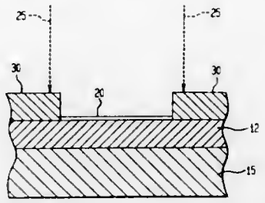
SUBSTRATES AND METHODS FOR GAS PHASE DEPOSITION OF SEMICONDUCTORS AND OTHER MATERIALS

Tien-Heng Chiu, Spotswood, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 346,444, Nov. 29, 1994, Pat. No. 5,462,012. This application Jun. 7, 1995, Ser. No. 475,110

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—48 **12 Claims**



1. A substrate for semiconductor growth comprising:

a wafer having a temperature monitoring zone of a growth preventing material, the temperature monitoring zone having an area of at least about 3 mm^2.

5,589,694

SEMICONDUCTOR DEVICE HAVING A THIN FILM TRANSISTOR AND THIN FILM DIODE

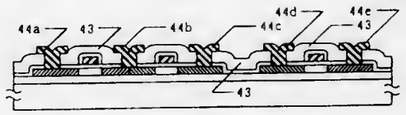
Toru Takayama, Kanagawa, and Yasuhiko Takemura, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Division of Ser. No. 216,107, Mar. 21, 1994, Pat. No. 5,501,989. This application Mar. 28, 1995, Ser. No. 411,972

Claims priority, application Japan, Mar. 22, 1993, 5-86744; Mar. 22, 1993, 5-86745; Mar. 22, 1993, 5-86746; Mar. 22, 1993, 5-86747

Int. Cl.[6] H01L *29/78*

U.S. Cl. 257—67 **25 Claims**



1. A semiconductor circuit having at least one thin film transistor and at least one thin film diode formed on a substrate, wherein

a semiconductor film that forms an active region (channel-forming region) of said thin film transistor comprises the same layer of a semiconductor film as that of an intrinsic region (I-layer) of said thin film diode, and

a concentration of a catalyst element for promoting crystallization of semiconductor contained in source and drain regions of said thin film transistor is higher by more than one digit than that in the active region of said thin film transistor.

5,589,695

HIGH-PERFORMANCE HIGH-VOLTAGE DEVICE STRUCTURES

Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 158,675, Nov. 29, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,369

Int. Cl.[6] H01L *27/01;29/68;29/78*

U.S. Cl. 257—77 **13 Claims**

1. A high-voltage power device structure having a low $R_{d(on)}$, comprising:

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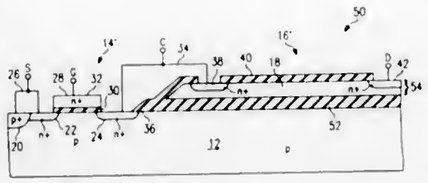


a source region of a first conductivity type formed in a silicon substrate region;

a gate electrode located over said silicon substrate region adjacent said source region;

a high voltage drift region located in a non-silicon-only substrate region, wherein said non-silicon-only substrate region comprises silicon-carbide;

a drain region of said first conductivity type located in said high voltage drift region;

a first diffused region of said first conductivity type located in said silicon substrate region adjacent said gate electrode;

a second diffused region of said first conductivity type located in said high voltage drift region and connected to said first diffused region.

5,589,696

TUNNEL TRANSISTOR COMPRISING A SEMICONDUCTOR FILM BETWEEN GATE AND SOURCE/DRAIN

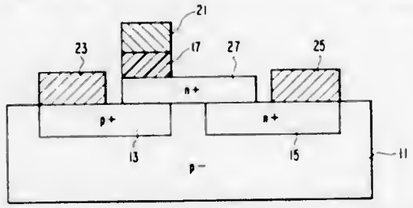
Toshio Baba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 14, 1992, Ser. No. 960,863

Claims priority, application Japan, Oct. 15, 1991, 3-265749

Int. Cl.[6] H01L *29/06;29/861;29/866*

U.S. Cl. 257—105 **15 Claims**



1. A tunnel transistor including a semiconductor substrate having a principal surface and doped with an impurity of a first conductivity type to a first concentration and degenerate first and second semiconductor layers formed contiguous to said principal surface with a spacer region left therebetween and doped with an impurity of said first conductivity type and a second conductivity type, respectively, to a concentration higher than said first concentration, said tunnel transistor comprising:

a degenerate third semiconductor layer formed on top of said principal surface and doped with an impurity of said second conductivity type to cover said spacer region and first and second parts of said first and said second semiconductor layers, respectively, while leaving third and fourth parts of said first and said second semiconductor layers uncovered;

a gate isolating film formed on said third semiconductor layer over said first part of the first semiconductor layer and having a wider forbidden bandwidth than said third semiconductor layer;

a gate electrode on said gate isolating film; and

a pair of electrodes forming ohmic junctions with said third and said fourth parts of the first and the second semiconductor layers.

5,589,697

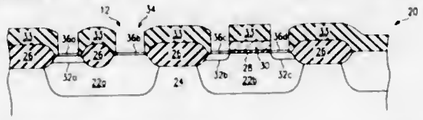
CHARGE PUMP CIRCUIT WITH CAPACITORS

Michael C. Smayling, Missouri City, Tex., and Luciano Talamonti, Rieti, Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 270,090, Jul. 1, 1994, Pat. No. 5,479,040, which is a division of Ser. No. 65,694, May 21, 1993, Pat. No. 5,364,801, which is a continuation of Ser. No. 628,783, Dec. 17, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 473,051

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—204 **25 Claims**



1. A charge pump comprising:

first and second clocks having a predetermined phase differential;

a plurality of Schottky diodes coupled in series; and

a plurality of capacitors having first and second plates, said first plates coupled between said Schottky diodes and said second plates alternately coupled to said first and second clocks.

5,589,698

SOLID STATE IMAGING DEVICE HAVING SLIDING POTENTIAL GRADIENT

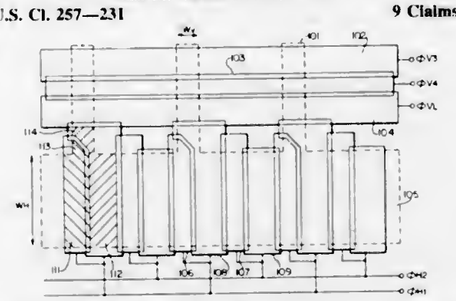
Yasutaka Nakashiba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 7, 1994, Ser. No. 350,897

Claims priority, application Japan, Dec. 10, 1993, 5-310513

Int. Cl.[6] H01L *27/148;29/768*

U.S. Cl. 257—231 **9 Claims**



1. A solid state imaging device comprising:

a) a plurality of photo-electric converter elements;

b) a vertical charge transfer section receiving signal charges generated by said photo-electric converter elements and transferring said signal charges through a vertical channel section;

c) a horizontal charge transfer section receiving said signal charges transferred from said vertical channel section and transferring said signal charges through a horizontal channel section having:

1) a first region of one conductivity type having a first impurity concentration and serving as a charge storage region, and

2) a second region of said one conductivity type having a second impurity concentration and serving as a charge barrier region; and

d) a coupling region including a portion of said horizontal channel section extended towards said vertical channel section with a width substantially equal to the width of said vertical channel section to provide electrical coupling therebetween, said coupling region having a potential gradient continuously changing from said vertical channel section towards said horizontal channel section generated by varying the effective channel width associated with said first region in a complementing proportion to the effective channel width associated with said second region, while maintaining said width of said coupling region constant.

5,589,699

ELECTRICALLY ERASABLE PROGRAMMABLE NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING SELECT GATES AND SMALL NUMBER OF CONTACT HOLES

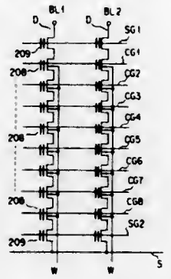
Hitoshi Araki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1994, Ser. No. 359,660

Claims priority, application Japan, Dec. 27, 1993, 5-348512; Jun. 30, 1994, 6-150242; Nov. 11, 1994, 6-277470

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **52 Claims**



1. A non-volatile semiconductor memory device comprising:

memory cell means for storing data, which has a source/drain region formed in a surface portion of a semiconductor substrate, a first control gate electrode formed on the source/drain region, and a first charge-accumulating region formed between the first control gate electrode and the semiconductor substrate, the first charge-accumulating region being charged with electricity in a writing mode as a result of a difference in potential between the first control gate electrode and the semiconductor substrate and between the first control gate electrode and the source/drain region, thereby setting the threshold voltage of the memory cell means to a value higher than a voltage applied to the first control gate electrode in a reading mode, the first charge-accumulating region being discharged of electricity in an erasing mode as a result of a difference in potential reverse to that in the writing mode, thereby setting the threshold voltage of the memory cell means to a value lower than the voltage applied to the first control gate electrode in the reading mode; and

select transistor means having a second control gate electrode located at an end portion of the memory cell means, and a second charge-accumulating region similar to the first charge-accumulating region and located between the second control gate electrode and the semiconductor substrate, the select transistor means having a positive threshold voltage at least in the reading mode and the writing mode for the memory cell means.

5,589,700

SEMICONDUCTOR NONVOLATILE MEMORY

Hironobu Nakao, Kyoto, Japan, assignor to Rohm Co., Ltd., Japan

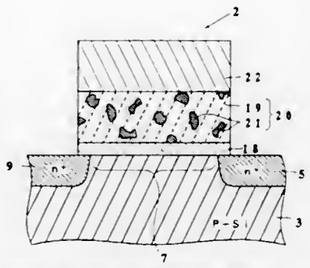
Continuation of Ser. No. 844,803, Mar. 2, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,698

Claims priority, application Japan, Aug. 20, 1991, 3-208058

Int. Cl.[6] H01L *29/792*

U.S. Cl. 257—325 **3 Claims**

1. A semiconductor device including a nonvolatile memory, comprising:



a first conductivity type semiconductor region;

a pair of second conductivity type diffusion regions formed within said first conductivity type semiconductor region;

an insulating layer formed on said first conductivity type semiconductor region;

a charge trapping layer comprising a plurality of silicon nitride regions formed within a silicon dioxide layer, said charge trapping layer formed on said insulating layer, and

a control electrode formed on said charge trapping layer.

5,589,701

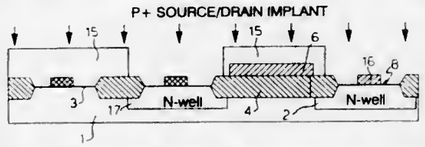
PROCESS FOR REALIZING P-CHANNEL MOS TRANSISTORS HAVING A LOW THRESHOLD VOLTAGE IN SEMICONDUCTOR INTEGRATED CIRCUITS FOR ANALOG APPLICATIONS

Livio Baldi, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 282,408, Jul. 28, 1994, Pat. No. 5,534,448. This application Jun. 7, 1995, Ser. No. 486,747

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—369 **9 Claims**



1. A CMOS integrated circuit for analog applications comprising:

a substrate of semiconductor material having a uniform first doping level and a uniform first work function;

a plurality of N-channel transistors;

a plurality of first P-channel transistors having a first threshold voltage, said first P-channel transistors having gate electrodes comprised solely of polysilicon, the polysilicon having a second doping level and a second work function, the second doping level being less than the first doping level, the second work function being less than the first work function, such that said first P-channel transistors have a positive flat band voltage; and

a plurality of second P-channel transistors having gate electrodes comprised solely of polysilicon having a different doping level than the second doping level of the first plurality of P-channel transistors the second P-channel transistors having a second threshold voltage, the second threshold voltage having an absolute value higher than the first threshold voltage.

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5,589,702

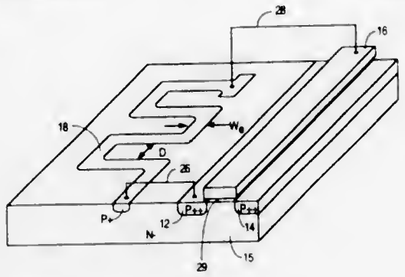
HIGH VALUE GATE LEAKAGE RESISTOR

Martin J. Alter, Los Altos, Calif., assignor to Micrel Incorporated, San Jose, Calif.

Division of Ser. No. 180,579, Jan. 12, 1994, Pat. No. 5,439,841. This application Apr. 10, 1995, Ser. No. 418,748

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—379 **22 Claims**



1. A device comprising:

a semiconductor substrate;

an MOS transistor having a gate, a source region, and a drain region, said source region and said drain region formed in said semiconductor substrate to a first diffusion depth and having a first dopant concentration; and

a high value gate leakage resistor for providing a specified resistance between a first node and a second node, said resistor formed proximate to said MOS transistor on said substrate, said resistor having a first end for connection to said gate and a second end for connection to a current sink,

wherein said resistor comprises a diffusion region formed in said substrate by implanting dopants into said substrate through an oxide portion less than a first thickness, said oxide portion less than said first thickness formed by ends of two opposing bird's beaks which have merged together, oxide portions greater than said first thickness blocking said dopants from implanting into said substrate, wherein the resistivity of said resistor is controlled by controlling the extent of merging of said bird's beaks.

5,589,703

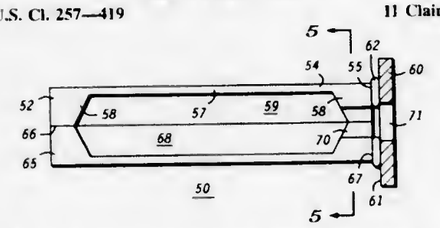
EDGE DIE BOND SEMICONDUCTOR PACKAGE

Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 28, 1995, Ser. No. 431,217

Int. Cl.[6] H01L *29/82*

U.S. Cl. 257—419 **11 Claims**



9. An edge die bond semiconductor package comprising:

a semiconductor die having an active major surface and a mounting edge substantially orthogonal to the active surface, the semiconductor die including a sensor diaphragm positioned in the major surface and a grid surrounding the diaphragm and defining a depression in the semiconductor die;

a constraint die having a cooperating surface formed to mate with the grid of the semiconductor die and a mounting edge substantially orthogonal to the cooperating surface, the semiconductor die and the constraint die being formed of materials having substantially similar temperature coefficients of expansion;

the semiconductor die and the constraint die being chemically bonded together so that a sensor cavity is defined between the diaphragm and the constraint die with the diaphragm defining one wall of the sensor cavity, the semiconductor die and the constraint die being further bonded with the mounting edge of the semiconductor die and the mounting edge of the constraint die forming a single mounting edge substantially orthogonal to the diaphragm;

a base having a mounting surface; and

material affixing the single mounting edge of the semiconductor die and the constraint die to the mounting surface of the base.

5,589,704

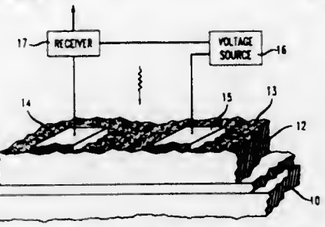
ARTICLE COMPRISING A SI-BASED PHOTODETECTOR

Barry F. Levine, Livingston, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 27, 1995, Ser. No. 379,422

Int. Cl.[6] H01L *31/0232*

U.S. Cl. 257—436 **8 Claims**



1. An article comprising a Si-based photodetector comprising

a) a crystalline Si layer disposed on a dielectric material, said Si layer having a major surface; and

b) spaced apart first and second contacts to the Si layer; and the article also comprises

c) a voltage source for providing a bias voltage between said first and second contacts, and a receiver that is responsive to a current between said first and second contacts, said current being responsive to electromagnetic radiation of wavelength λ incident on said major surface;

CHARACTERIZED IN THAT

d) the thickness t of said crystalline Si layer is less than an absorption length $0.5\ \alpha^{-1}$ in crystalline Si of said radiation of wavelength λ, and is in the range 1.5–5 μm;

e) said dielectric material has a refractive index that is less than a refractive index of crystalline Si; and

f) at least a portion of said major surface is textured, such that said radiation of wavelength λ is transmitted through said portion of the surface in substantially random directions, wherein associated with said at least portion of the surface is an average feature size, said average feature size being in the range $0.2(\lambda/2n)$ to $5(\lambda/2n)$, where n is the refractive index of crystalline Si for radiation of wavelength λ.

5,589,705

REAL-TIME SEMICONDUCTOR RADIATION DETECTOR

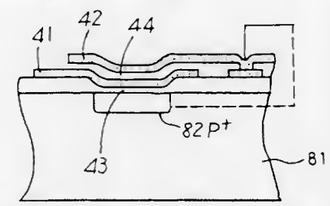
Yutaka Saito, and Yoshikazu Kojima, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Continuation of Ser. No. 36,058, Mar. 23, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 417,141

Claims priority, application Japan, Mar. 24, 1992, 4-066364; Mar. 5, 1993, 5-045439

Int. Cl.[6] H01L *31/00*

U.S. Cl. 257—459 **11 Claims**



1. A semiconductor radiation detector comprising: a semiconductor substrate; radiation detecting means formed on the semiconductor substrate for detecting incident radiation and producing a corresponding electrical output signal; an output electrode connected to the radiation detecting means; and a capacitor electrically connected to the radiation detecting means and the output electrode; wherein the radiation detecting means comprises a PN junction formed in a first surface of the semiconductor substrate and the output electrode is formed of a material selected from the group consisting of poly-si and a metal silicide; and wherein the capacitor comprises a plurality of electrodes and a plurality of insulating layers.

5,589,706

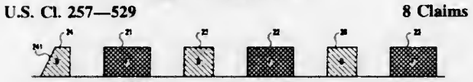
FUSE LINK STRUCTURES THROUGH THE ADDITION OF DUMMY STRUCTURES

Alexander Mitwalsky, Poughkeepsie, N.Y., and James G. Ryan, Newtown, Conn., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 31, 1995, Ser. No. 455,811

Int. Cl.[6] H01L *27/10*

U.S. Cl. 257—529 **8 Claims**



1. A fuse bank for an integrated circuit comprising:

an array of fuse links; and

an interstitial array of dummy structures in close proximity of the fuse links so as to promote forming vertical sidewalls and constant height of the fuse links, whereby the fuse links may be reliably and reproducibly cut by laser.

5,589,707

MULTI-SURFACED CAPACITOR FOR STORING MORE CHARGE PER HORIZONTAL CHIP AREA

John E. Cronin, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1994, Ser. No. 335,012

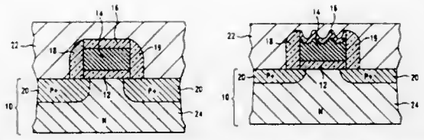
Int. Cl.[6] H01L *27/108;29/00*

U.S. Cl. 257—532 **2 Claims**

1. A semiconductor chip comprising:

a semiconductor substrate, first and second regions of a first conductivity type deposed therein, said regions being separated by a third region of a second conductivity type;

a first elongated dielectric layer disposed on a portion of a surface of said substrate overlying a portion of said third region;



a first, conductive, elongated capacitor plate, having a selected width and further having a pair of sidewalls of a selected height, located over said first dielectric layer on said substrate and separated from said third region in said substrate by said first dielectric layer,

a second dielectric layer deposed along substantially the full length of a first one of said pair of sidewalls;

a third dielectric layer deposed along substantially the full length of the other one of said pair of sidewalls;

a fourth dielectric layer disposed over substantially the full length of said top surface; and

a second capacitor conductive plate extending along substantially the full length of one of the dielectric layers on one of said sidewalls and in electrical contact with said first region in said substrate, wherein the first capacitor plate has a top surface that is non-planar.

5,589,708

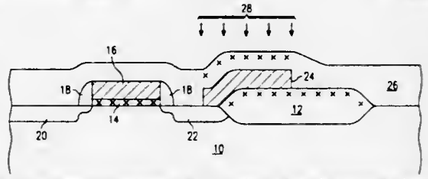
RADIATION HARD INTEGRATED CIRCUITS WITH IMPLANTED SILICON IN GATE OXIDE LAYER, FIELD OXIDE REGION, AND INTERLEVEL DIELECTRIC LAYER

Alexander Kalnitsky, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 905,020, Jun. 26, 1992, Pat. No. 5,418,174. This application Jan. 5, 1995, Ser. No. 368,889

Int. Cl.[6] H01L *23/552;23/58*

U.S. Cl. 257—646 **3 Claims**



1. A structure consisting of a portion of an integrated circuit, comprising:

an active area;

a plurality of field oxide regions;

a lightly doped polysilicon structure over a portion of the active area and filed oxide regions;

an interlevel dielectric layer disposed over the active area, field oxide regions, and lightly doped polysilicon structure, wherein selected portions of the interlevel dielectric layer have implanted silicon ions of a sufficient dose to form electron traps to capture radiation induced electrons, wherein the dose is less than $1\times10^{14}/cm^2$.

5,589,709

LEAD FRAME CAPACITOR AND CAPACITIVELY-COUPLED ISOLATOR CIRCUIT USING SAME

Robert C. Dobkin, Monte Sereno, and Robert L. Reay, Mountain View, both of Calif., assignors to Linear Technology Inc., Milpitas, Calif.

Division of Ser. No. 985,881, Dec. 3, 1992, Pat. No. 5,444,600. This application Mar. 8, 1995, Ser. No. 401,027

Int. Cl.[6] H01L *23/495*

U.S. Cl. 257—666 **17 Claims**

1. An isolator circuit comprising:

a first circuit adapted to be coupled to a first ground potential;

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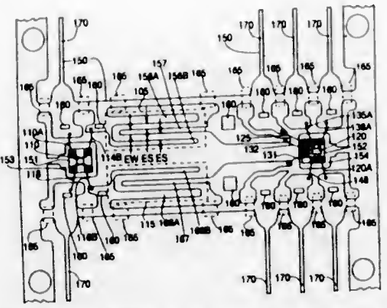


a second circuit adapted to be coupled to a second ground potential; and

one or more capacitors coupled between the first circuit and second circuit for providing capacitively-coupled isolation therebetween, the capacitors having electrodes formed from a lead frame structure.

5,589,710

Patent Not Issued For This Number

5,589,711

SEMICONDUCTOR PACKAGE

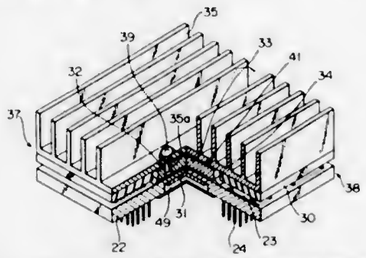
Toshifumi Sano; Masahiro Yamada; Yoshiaki Umezawa; Yoshikatsu Okada, and Akira Natori, all of Tokyo, Japan, assignors to NEC Corporation, and Japan Aviation Electronics Industry, Limited, both of Japan

Filed Dec. 28, 1994, Ser. No. 365,502

Claims priority, application Japan, Dec. 29, 1993, 5-351496

Int. Cl.[6] H01L *23/34;23/552*

U.S. Cl. 257—718 **18 Claims**



1. A multi-chip package for packaging a semiconductor device comprising a substrate having upper and lower surfaces, a primary integrated circuit chip mounted on the lower surface of said substrate, secondary integrated circuit chips mounted on a predetermined region of the upper surface of said substrate, said multi-chip package comprising:

a heat sink having a convex section, said convex section being opposed to said primary integrated circuit chip, said heat sink being thermally connected to said primary integrated circuit chip through said convex section, said convex section having a hole at a center thereof;

a stud member, comprising a rod section and a board section, for fixing said heat sink to said substrate with the rod section inserted in the hole and with the board section inserted between said heat sink and said substrate, the rod section having a threaded end, said stud member being fixed to said substrate by an adhesive; and

a nut screwed to said threaded end, thereby fixing said heat sink to said substrate.

5,589,712

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD OF MANUFACTURING THE SAME

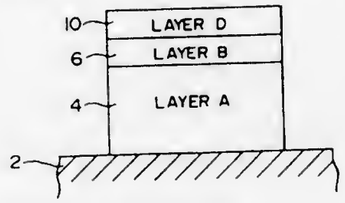
Ikue-Kawashima, Kohbe, and Katsunari Hanaoka, Ono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 2, 1994, Ser. No. 349,033

Claims priority, application Japan, Dec. 3, 1993, 5-339563; Aug. 26, 1994, 6-225763

Int. Cl.[6] H01L *23/48;21/44*

U.S. Cl. 257—750 **14 Claims**



1. A semiconductor device comprising:

a substrate formed with semiconductor elements; and

a metal wiring having a laminated structure and provided on said substrate, said metal wiring including:

a first layer A having aluminum as a main component; and

a second layer D formed on said first layer A, said second layer D having as main components titanium and nitrogen in a given ratio such that a reflectance of said second layer D is 30% or less for a given wavelength of exposing light in a range including wavelengths different from that of i-light.

5,589,713

SEMICONDUCTOR DEVICE HAVING AN IMPROVED WIRING LAYER

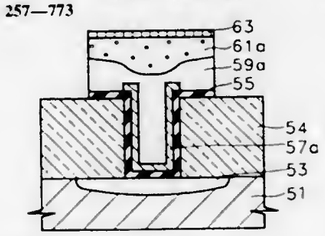
Sang-in Lee, and Chang-soo Park, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 8,775, Jan. 25, 1993. This application Jun. 1, 1995, Ser. No. 456,732

Claims priority, application Rep. of Korea, Jan. 23, 1992, 92-904

Int. Cl.[6] H01L *29/54*

U.S. Cl. 257—773 **22 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

an insulating layer formed over said semiconductor substrate, said insulating layer having an opening formed therein, said opening exposing a portion of a surface of a layer underlying said insulating layer,

a reactive spacer formed on a sidewall of said opening, said spacer comprised of any one selected from the group consisting of Ge, Mg Sn, In, Pb and Zn; and

a first conductive layer formed over said insulating layer, over said reactive spacer, and over said exposed surface portion of said layer underlying said insulating layer.

5,589,714

EPOXY POLYMER FILLED WITH ALUMINUM NITRIDE-CONTAINING POLYMER AND SEMICONDUCTOR DEVICES ENCAPSULATED WITH A THERMOSETTING RESIN CONTAINING ALUMINUM NITRIDE PARTICLES

Kevin E. Howard, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 351,450, Dec. 8, 1994, Pat. No. 5,508,110, which is a continuation-in-part of Ser. No. 895,496, Jun. 8, 1992, Pat. No. 5,234,712. This application Mar. 24, 1995, Ser. No. 410,264

Int. Cl.[6] H01L *23/29*

U.S. Cl. 257—788 **10 Claims**

1. An encapsulated semiconductor device, comprising:

(a) a semiconductor device, which is encapsulated in

(b) a cured thermosetting resin filled with from about 1 to about 90 weight %, based on the combined weight of the resin and aluminum nitride particles, of aluminum nitride particles which have an outer layer of Al—O—N into which amorphous Si—O is incorporated, and which additionally have a layer of Si—O or Si—O—Al on the surface of said Al—O—N layer; and

(c) a plurality of conductive leads which are in electrical connection with said semiconductor device and which extend through the cured thermosetting resin.

5,589,715

METER MODULE ASSEMBLY

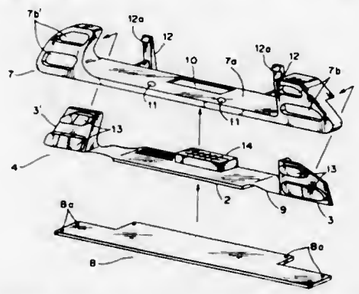
Keizo Nishitani, Susono, and Hiroshi Suzuki, Haibara-gun, both of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 27, 1995, Ser. No. 411,304

Claims priority, application Japan, Mar. 28, 1994, 6-057071

Int. Cl.[6] H02B *1/26;* **H02G** *3/00*

U.S. Cl. 307—10.1 **6 Claims**



1. A meter module assembly having at least one junction box for distributing input/output signals and electric power to on-vehicle electrical components, at least one switch unit having a plurality of switches for controlling said electrical components, and an instrument board, comprising:

a circuit board by means of which said junction box and said switch unit are electrically connected to form a control board, said junction box and said switch unit being horizontally juxtaposed in a direction perpendicular to a longitudinal axis of a vehicle with which said meter module assembly is use; and

a panel-mounting case having a first case and a second case, said first case having said instrument board mounted upright thereon in vertical and crosswise arrangement relative to said longitudinal axis of the vehicle, said first case and second case being vertically assembled together in integral construction with said control board sandwiched between said first and second cases, said first case being provided with a hole through which said instrument board is electrically connected with said control board when said instrument board and said first and second cases are assembled together.

5,589,716

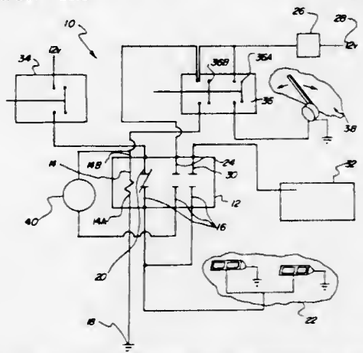
LIGHT-GOVERNED WINDSHIELD WIPER AND HEADLIGHT CONTROL SYSTEM WITH PROVISION FOR MAINTAINING THE HEADLIGHTS ON WITH INSUFFICIENT AMBIENT LIGHT

Gyles B. Dailey, 820 Dogwood Dr., New Ellenton, S.C. 29809

Filed Sep. 20, 1995, Ser. No. 531,321

Int. Cl.[6] B60L *1/14*

U.S. Cl. 307—10.8 **2 Claims**



1. A new and improved light-governed windshield wiper and headlight control system comprising, in combination:

a relay having a switching coil with a negative terminal thereof connected to ground and further including:

a first switching contact coupled to the headlights of the automobile and having a closed orientation when the switching coil is relaxed,

a second switching contact coupled to an ignition actuator device which supplies direct current from a power supply when closed, the second switching contact having an open orientation when the switching coil is relaxed, and

a third switching contact coupled between the headlights of an automobile and auxiliary power source which supplies direct current from said auxiliary power source, the third switching contact having an open orientation when the switching coil is relaxed;

a light-governed switching means coupled between the second switching contact of the relay and switching coil of the relay, the light-governed switching means having an open orientation when exposed to sufficient light thereby precluding current flow therebetween and further having a closed orientation when exposed to insufficient light thereby allowing continued excitation of the switching coil upon initial excitation thereof;

a single pole single throw headlight switch coupled between the first switching contact of the relay and power supply, the headlight switch having an open orientation for withholding current from the first switching contact of the relay, the headlight switch further having a closed orientation for allowing direct current to flow to the first switching contact of the relay thereby activating the headlights when switching coil is relaxed;

a double pole single throw wiper switch having a first wiper switch contact coupled between a wiper blades circuit and ignition actuator device and further comprising a second wiper switch contact coupled between the switching coil of the relay and the ignition actuator device, the wiper switch having an open orientation for withholding direct current, the wiper switch further having a closed orientation for allowing direct current to flow to the wiper blades circuit, switching coil of the relay, and second switching contact of the relay thereby activating the windshield wipers and headlights coincidently and further exciting the switching coil hence continu-

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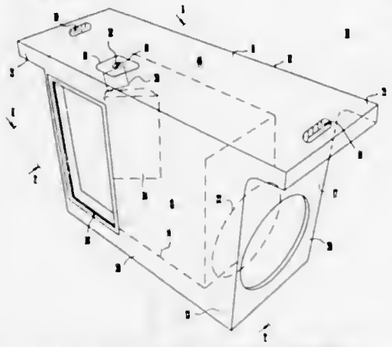
ing activation of the headlights when the windshield wipers are deactivated and there is insufficient light.

5,589,717

COMPACT SPECTRUM ANALYZER MODULE

Chiu Chau, Woodbridge, N.J., assignor to Instruments SA, Inc., Edison, N.J.

Continuation of Ser. No. 2,597, Jan. 11, 1993, abandoned.
This application Sep. 12, 1995, Ser. No. 527,290
Int. Cl.[6] G01J *3/28*
U.S. Cl. 356—328 **22 Claims**



1. A compact spectrum analyzer module, comprising:

a) a concave diffraction grating having an optical axis and having grating grooves extending generally perpendicularly to said optical axis;

b) an inlet for admitting an input beam of light to be analyzed along an input path in an input direction generally transverse to said optical axis and to said grating grooves;

c) an input mirror oriented at an angle to said input path to reflect said input beam toward said diffraction grating, said light beam traveling from said input mirror to said diffraction grating in a plane of incidence to said diffraction grating said plane of incidence passing through said optical axis of the diffraction grating transversely of said grooves;

d) output mirror positioned to intercept light dispersed by said diffraction grating and reflect said dispersed light in an output direction; and

e) an output aperture for egress of light from said module; wherein said output direction is transverse to said plane of incidence to said diffraction grating and said input direction and said output direction is rotated about said diffraction grating optical axis through an acute angle of at least 28°, or through a right angle, to said input direction.

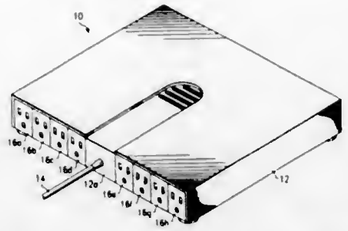
5,589,718

POWER LINE CONDITIONER

Noel Lee, Daly City, Calif., assignor to Monster Cable International, Ltd., Hamilton, Bermuda

Filed Apr. 14, 1995, Ser. No. 422,442
Int. Cl.[6] H02J *1/00*
U.S. Cl. 307—72 **3 Claims**

1. A power line conditioner comprising a housing, a plurality of outlets mounted on said housing for receiving AC plugs from a plurality of electrical components, means for connecting said housing to a source of AC power, means for distributing said AC power to each of said outlets, and means associated with said outlets for processing the AC power distributed to said outlets and therefore to the components connected to the outlets to improve the performance of the components, the processing means associated with at least one of said outlets differing from the processing means associated with at least one other outlet so that said outlets can



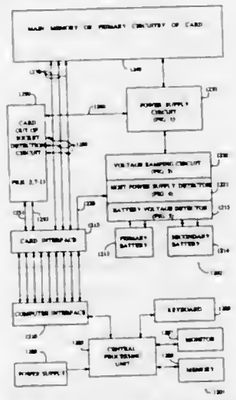
accommodate components with different electrical characteristics, each of said outlets having a color associated therewith which corresponds to the color associated with one of said components for providing a visual indication of the type of component that should be connected to the outlet.

5,589,719

CARD OUT OF SOCKET DETECTOR FOR IC CARDS

Peter D. Fiset, 5 Upper Loudon Rd., Loudonville, N.Y. 12211

Filed Mar. 10, 1995, Ser. No. 401,778
Int. Cl.[6] H05K *1/11*
U.S. Cl. 307—131 **13 Claims**



1. An IC card circuit for a portable IC card selectively insertable and extractable from a host terminal unit thereby connecting and disconnecting the IC card circuit from the host terminal unit comprising,

a function generating circuit,

an internal power supply for applying a voltage to said function generating circuit to maintain the proper sequencing of states of said function generating circuit when the IC card circuit is not connected to the host terminal unit,

a first card detect socket for mating with a first card detect pin of the host terminal connector,

a second card detect socket for mating with a second card detect pin of the host terminal connector,

a card operating properly detector for detecting the ability of the portable IC card to function properly, responsive to the state of said internal power supply and responsive to the state of said function generating circuit;

a first transistor for receiving current into the base of said first transistor from the host terminal's first card detect pin,

a first impedance means for biasing the collector of said first transistor to said internal power supply,

a second transistor for receiving current into the base of said second transistor from the host terminal's second card detect pin,

a second impedance means for biasing the collector of said second transistor to said internal power supply,

a logic element for outputting a card insertion and extraction signal responsive to signals from the collectors of said first transistor and said second transistor,

a power input terminal for supplying power to said internal power supply from said host terminal unit when the IC card is connected to said host terminal unit,

a power switch connected in series between said power input terminal and said internal power supply, and

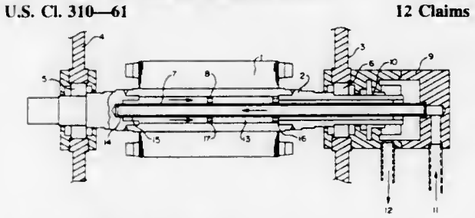
a supply voltage detecting circuit for receiving said card insertion and extraction signal indicative of the connection with and disconnection from said host terminal unit and the voltage of said internal power supply for generating an output signal for the opening and closing of said power switch.

5,589,720

ELECTRIC MOTOR WITH COOLING DEVICE

Josef Berger, Vienna, Austria, assignor to Elin Motoren GmbH, Vienna, Austria

PCT No. PCT/AT93/00140, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO94/06196, PCT Pub. Date Mar. 17, 1994
PCT Filed Sep. 9, 1993, Ser. No. 397,231
Claims priority, application Austria, Sep. 10, 1992, 1807/92
Int. Cl.[6] H02K *9/00;1/32*
U.S. Cl. 310—61 **12 Claims**



1. An electric motor comprising:

a rotatable shaft having therewithin a longitudinally extending bore, said shaft having a first end portion and a second end portion;

a longitudinally extending tube positioned within said longitudinally extending bore of said shaft, a space existing between an exterior of said tube and an interior of said bore, said tube having a first end portion at the first end portion of said shaft and a second end portion at the second end portion of said shaft, said first end portion of said tube having at least one lateral bore for communicating an interior of said tube with said space between the exterior of said tube and the interior of said bore;

a rotor rigidly secured onto said rotatable shaft;

a frame, a stator secured onto said frame, said frame comprising first and second spaced-apart end members, said first end member supporting a drive-side bearing and said second end member supporting an operating-side bearing, said drive-side bearing receiving the first end portion of said shaft and said operating-side bearing receiving the second end portion of said shaft, said second end portion of said shaft having an extension extending beyond said operating-side bearing; and

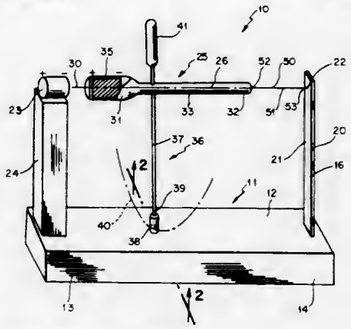
a device, secured onto said second end member of said frame, over said extension of said second end portion of said shaft, having a passageway in communication with the interior of said tube for transferring a cooling fluid through said device into said tube at said second end portion of said shaft, along the interior of said tube, through said lateral bore in said first end portion of said tube, along said space between the exterior of said tube and the interior of said longitudinal bore of said shaft.

5,589,721

DISPLAY APPARATUS UTILIZING MAGNETIC INTERACTION

Quansheng Han, and Bruce Lahn, both of 863 Mass. Ave. #24, Cambridge, Mass. 02139

Filed Dec. 11, 1995, Ser. No. 570,501
Int. Cl.[6] H02K *7/09;* **G09F** *19/00*
U.S. Cl. 310—90.5 **18 Claims**



1. A display apparatus comprising:

a base assembly including an anchoring point, and a first magnet disposed in spaced relation relative to the anchoring point;

a suspension member disposed between the anchoring point and the first magnet and including a longitudinal axis, a first end which is adjacent to the first magnet, an opposite second end, a second magnet mounted on the first end thereof, and a third magnet member radially mounted thereon;

means for tethering the suspension member to the anchoring point;

wherein the first magnet is polarized to attract the second magnet so that the first magnet is operable to magnetically support the suspension member in a suspended state where the suspension member is in spaced relation relative to the first magnet, the anchoring point and the base assembly, respectively; and

means for electromagnetically impelling the third magnet member when the suspension member is rotated about its longitudinal axis thereby maintaining the rotation of the suspension member.

5,589,722

SHEET COIL MOTOR AND METHOD OF FABRICATING THE SAME

Takahiro Sakaguchi, Kodaira, and Fumio Sakamoto, Machida, both of Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Apr. 14, 1994, Ser. No. 227,792
Claims priority, application Japan, Apr. 16, 1993, 5-019623 U; Apr. 16, 1993, 5-090195; Mar. 24, 1994, 6-053774
Int. Cl.[6] H02K *3/26;21/12;19/26*
U.S. Cl. 310—180 **16 Claims**

1. A sheet coil motor comprising:

a driving sheet coil formed by a plurality of coil units with each coil unit composed of a plurality of independent coils formed on a substrate and arranged relative to one another such that the plurality of coils in each coil unit has the shape of a sector; and

a rotor magnet provided opposite the driving sheet coil at a close distance,

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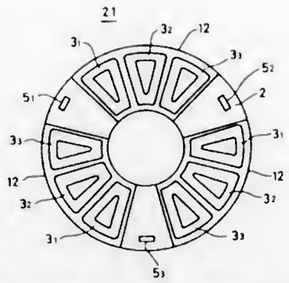


wherein said driving sheet coil is configured such that said plurality of coil units are concentrically arranged and disposed a predetermined distance from each other.

5,589,723

DRIVING APPARATUS USING TRANSDUCER

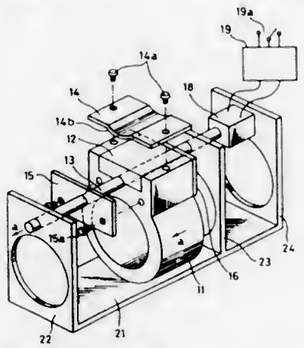
Ryuichi Yoshida, Sakai; Yasuhiro Okamoto, Tondabayashi, and Minoru Kuwana, Osaka, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Mar. 15, 1995, Ser. No. 404,240

Claims priority, application Japan, Mar. 29, 1994, 6-081127; Mar. 29, 1994, 6-081128; Mar. 29, 1994, 6-081129; Mar. 29, 1994, 6-081130; Apr. 26, 1994, 6-088562; Apr. 27, 1994, 6-089797; Aug. 30, 1994, 6-227396; Oct. 4, 1994, 6-240339; Nov. 21, 1994, 6-309488

Int. Cl.[6] H01L *41/08;* **H02N** *2/00*

U.S. Cl. 310—328 **19 Claims**



1. A driving apparatus comprising:

a transducer for producing repeatable linear displacements in a predetermined direction;

a driving member coupled with said transducer for simultaneous displacement therewith and having a guide surface formed in the direction of displacement of said transducer;

a moving member having a friction member in surface-to-surface contact with the guide surface of said driving member, said moving member being movable along said guide surface; and

a pushing member furnished on said moving member for pushing said friction member against said guide surface.

5,589,724

PIEZOELECTRIC DEVICE AND A PACKAGE

Yuki Satoh, Neyagawa; Toshio Ishizaki, Kobe; Tsuyoshi Sakaue, Neyagawa; Koji Hashimoto, Kobe; Tohru Yamada, Katano, and Tomoki Uwano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

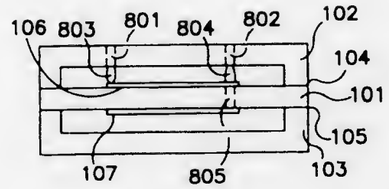
Continuation of Ser. No. 186,566, Jan. 25, 1994, abandoned.

This application Dec. 7, 1994, Ser. No. 350,717

Claims priority, application Japan, Jan. 25, 1993, 5-010125; Mar. 30, 1993, 5-071440; Apr. 16, 1993, 5-089610; Apr. 16, 1993, 5-089611

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—348 **7 Claims**



1. A piezoelectric device comprising:

a piezoelectric plate provided with at least one electrode at almost a central portion of each face,

a first plate made of an ionic material having a recessed portion to cover said at least one electrode at one face to face said piezoelectric plate, and

a second plate made of an ionic material having a recessed portion to cover said at least one electrode at one face to face said piezoelectric plate,

wherein each of said at least one electrode is packaged by direct bonding said piezoelectric plate with said first plate and said second plate so as to be sandwiched therebetween with no intervening adhesive or structure, and

said at least one electrode on one face of said piezoelectric plate is led to the other face of said piezoelectric plate via at least one through-hole filled with a conductive material.

5,589,725

MONOLITHIC PRESTRESSED CERAMIC DEVICES AND METHOD FOR MAKING SAME

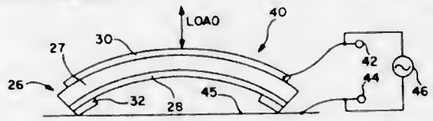
Gene H. Haertling, Central, S.C., assignor to Research Corporation Tech., Inc., Tucson, Ariz.

Division of Ser. No. 21,367, Feb. 23, 1993, Pat. No. 5,471,721.

This application May 5, 1995, Ser. No. 435,698

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—358 **46 Claims**



1. An internally asymmetrically stress biased ceramic element comprising:

a concave shaped ceramic element having first and second opposing surfaces;

said first surface being a conductive reduced layer of the ceramic material and in tension; and

said second surface being in compression.

5,589,726

ARC LAMP WITH EXTERNAL MAGNETIC MEANS

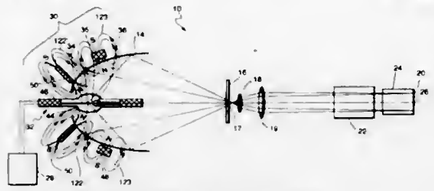
Ronald S. Gold, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 171,289, Dec. 21, 1993, abandoned.

This application Sep. 25, 1995, Ser. No. 533,724

Int. Cl.[6] H01J *1/50*

U.S. Cl. 313—161 **14 Claims**



1. An arc lamp point light source comprising:

a bulb for generating and emitting a light source including a first and a second electrode having a gap therebetween, the electrodes being enclosed and hermetically sealed in bulb envelope filled with an ionizing gas;

connector means for applying a voltage potential across the electrodes to generate an arc plasma having an arc volume and an arc centroid in the gap when electric current passes between the first and second electrodes; and

magnetic field means located outboard of the bulb envelope for generating at least two magnetic fields, the magnetic fields operable to produce lines of force, for converging the arc plasma toward the arc centroid, wherein said magnetic field means comprises a first magnetic field means for spherically symmetrically compressing the volume of the arc plasma between the first and second electrodes, and a second magnetic field means for adjusting the magnetic field generated by the first magnetic field means.

5,589,727

ENERGY STORAGE SYSTEM

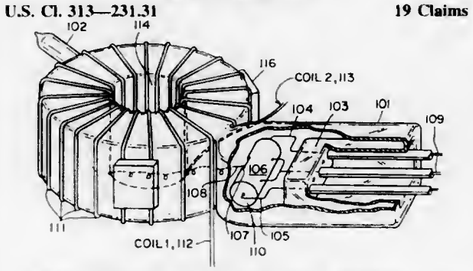
D. Clint Seward, Acton, Mass., assignor to Electron Power Systems, Acton, Mass.

Continuation-in-part of Ser. No. 841,308, Feb. 24, 1992, Pat. No. 5,175,466, which is a continuation of Ser. No. 529,783, May 25, 1990, abandoned, which is a continuation of Ser. No. 214,904, Jun. 28, 1988, abandoned, which is a continuation of Ser. No. 914,629, Oct. 2, 1986, abandoned. This application Dec. 24, 1992, Ser. No. 996,752

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.[6] H05H *1/46*

U.S. Cl. 313—231.31 **19 Claims**



1. A charged particle energy storage device comprising:

a vacuum tube for housing a plurality of electrons circulating within the vacuum tube;

a magnetic field generator for providing a magnetic field having closed magnetic field lines within the vacuum tube; and

an electron source for delivering a plurality of electrons into a predetermined path within the vacuum tube, the electrons having a substantially uniform velocity such that the predetermined path comprises a spiral about an axis that is parallel to a closed magnetic field line of the magnetic field;

a gas source for delivering a plurality of gaseous particles into the vacuum tube such that the gaseous particles interact with the electrons to form energized particles; and

a valve to control an opening in the vacuum tube such that the energized particles can be removed from the vacuum tube through the opening.

5,589,728

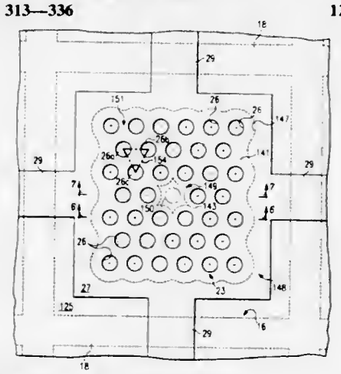
FIELD EMISSION DEVICE WITH LATTICE VACANCY POST-SUPPORTED GATE

Jules D. Levine, Dallas; Chi-Cheong Shen, and Robert Taylor, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 30, 1995, Ser. No. 453,043

Int. Cl.[6] H01J *1/02*

U.S. Cl. 313—336 **12 Claims**



6. An electron emitter plate comprising:

a substrate;

a first layer of conductive material deposited on said substrate; said first layer of conductive material being patterned in a mesh structure defining a plurality of mesh spacings;

a layer of insulating material deposited on said substrate over said first layer of conductive material and said mesh spacings;

a second layer of conductive material deposited on said substrate over said layer of insulating material; said second layer of conductive material having a cluster of apertures located within each mesh spacing; the apertures of each cluster being arranged in a regular, periodic array defining a lattice having at least one internal vacancy;

a conductive microtip formed in each aperture in electrical communication with said first layer of conductive material;

said insulating layer being formed with a cavity located within each mesh spacing, each cavity connecting the apertures of one of said clusters and commonly containing the microtips associated with that cluster; said insulating layer supporting said second layer of conductive material above said first layer of conductive material peripherally of each cavity; and said insulating layer forming a post under each lattice vacancy, said post supporting said second layer of conductive material above said first layer of conductive material centrally of each cavity.

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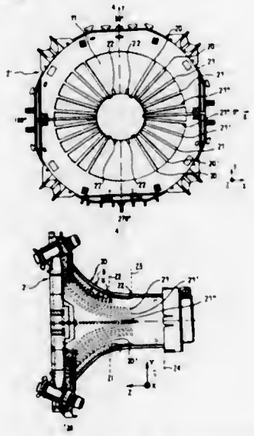
5,589,729

DEFLECTION YOKE LINER WITH SUPPORT RIDGES

Jean-Phillippe Descombes, Premières, and Phillippe Marotte, Genlis, both of France, assignors to Thomson Tubes & Displays, S.A., France

Filed Jun. 5, 1995, Ser. No. 464,431
Claims priority, application European Pat. Off., Jul. 1, 1994, 94401503
Int. Cl.[6] H01J *29/82;29/76*
U.S. Cl. 313—440 9 Claims



1. A deflection yoke for a cathode ray tube, comprising:

a deflection coil; and

a separator for supporting said deflection coil, said separator having a plurality of support ridges for supporting said deflection coil that bears against said support ridges in a manner to space said deflection coil from a surface of said separator, said supporting ridges extending in a longitudinal direction between a front portion and a rear portion of the separator, a given one of said supporting ridges being placed at an intersection of a surface of said separator with a radial plane.

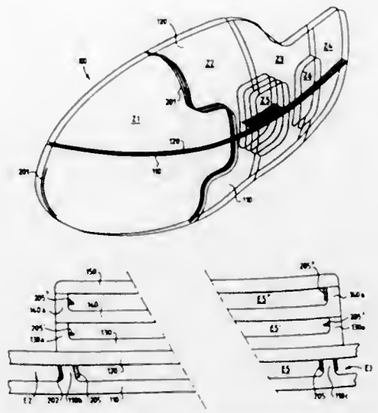
5,589,730

MOTOR VEHICLE LIGHTING/INDICATING APPARATUS USING LUMINESCENT DISCHARGE

Marc Brassier, Vincennes; Jean-Claude Gasquet, Saint-Clement; Daniel Segaud, Paris, and Bernard Mauroy, Roissy en Brie, all of France, assignors to Valeo Vision, Bobigny Cedex, France

Filed Oct. 12, 1993, Ser. No. 135,693
Claims priority, application France, Oct. 12, 1992, 92 12136
Int. Cl.[6] H01J *61/30*
U.S. Cl. 313—493 23 Claims

1. A lighting or indicating apparatus for a vehicle comprising a light transmitting element and a base element disposed behind said light transmitting element, wherein the light transmitting element constitutes an outer wall having at least one surface which is at least partly curved, the base element constitutes an inner wall, said outer and inner walls together define a thin envelope defining at least one closed cavity within the outer and inner walls, said at least one closed cavity being gastight for containing gas under low pressure, and the apparatus further includes at least two electrodes situated in the at least one closed cavity, and means connected with the electrodes for applying a voltage for starting and maintaining a luminescent gas discharge in said cavity, said apparatus defining at least one zone having at least two superimposed cavities each containing a gas under low pressure.

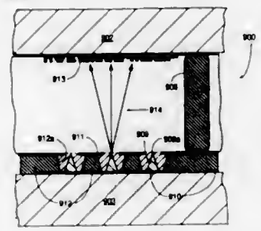


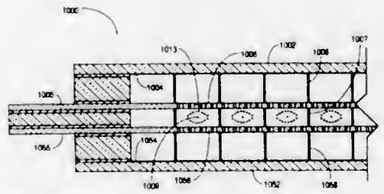
5,589,731

INTERNAL SUPPORT STRUCTURE FOR FLAT PANEL DEVICE

Theodore S. Fahlen, San Jose; Robert M. Duboc, Jr., Menlo Park, and Paul A. Lovoi, Saratoga, all of Calif., assignors to Silicon Video Corporatinn, San Jose, Calif.

Continuation-in-part of Ser. No. 867,044, Apr. 10, 1992, Pat. No. 5,424,605. This application Feb. 1, 1993, Ser. No. 12,542
Int. Cl.[6] H01J *29/04*
U.S. Cl. 313—495 74 Claims





1. A flat panel device comprising:

a faceplate;

a backplate connected to the faceplate to form a sealed enclosure;

means for emitting light from the flat panel device; and

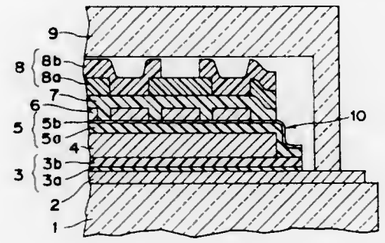
a spacer situated within the enclosure and supporting the backplate and the faceplate against forces acting in a direction toward the enclosure, wherein the spacer is made of ceramic reinforced glass or metal coated with an electrically insulating layer.

5,589,732

COLOR THIN FILM ELECTROLUMINESCENCE PANEL

Katsushi Okibayashi, Sakurai; Takashi Ogura, Nara, and Masaru Yoshida, Nara-ken, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 4,067, Jan. 13, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 378,869
Claims priority, application Japan, Jan. 18, 1992, 4-006957
Int. Cl.[6] H01J *1/62*
U.S. Cl. 313—506 10 Claims



1. A color film electroluminescence panel, comprising:

an electroluminescence device;

buffer means, provided on the electroluminescence device, including silicon resin as a main ingredient thereof and having a thickness of at least 2 μm for reducing the possibility of dielectric breakdown of the color film electroluminescence panel by creating a buffer between the electroluminescence device and a color filter; and

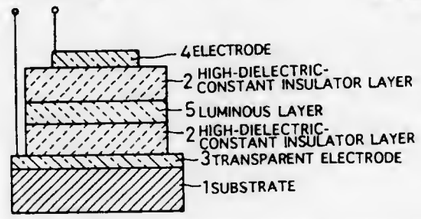
the color filter, laminated via the dielectric breakdown reduction means onto the electroluminescence device.

5,589,733

ELECTROLUMINESCENT ELEMENT INCLUDING A DIELECTRIC FILM OF TANTALUM OXIDE AND AN OXIDE OF EITHER INDIUM, TIN, OR ZINC

Koji Noda, Nagoya; Hisayoshi Fujikawa; Katsuji Yamashita, both of Seto, and Yasunori Taga, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Feb. 17, 1995, Ser. No. 390,567
Claims priority, application Japan, Feb. 17, 1994, 6-020430
Int. Cl.[6] H01J *1/70*
U.S. Cl. 313—509 16 Claims



1. An electroluminescent element comprising a dielectric film, said dielectric film comprising:

tantalum oxide; and

at least one metal oxide selected from the group consisting of indium oxide and tin oxide, being incorporated in said tantalum oxide,

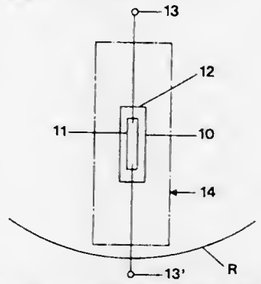
said dielectric film being formed as a thin film, and the content of metal atoms in said at least one metal oxide being 55 atomic % or less with respect to the total content of metal atoms in said tantalum oxide and said at least one metal oxide.

5,589,734

ELECTRIC LAMP HAVING A FLUORESCENCE-SUPPRESSED QUARTZ-GLASS ENVELOPE, AND QUARTZ GLASS THEREFOR

Manfred Deisenhofer, Altenmuenster; Dieter Meiss, Tuebingen, and Ekkehard Messner, Augsburg, all of Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

Filed May 11, 1995, Ser. No. 439,472
Claims priority, application Germany, May 25, 1994, 44 18 198.1
Int. Cl.[6] H01J *17/16;61/30*
U.S. Cl. 313—636 16 Claims



1. A lamp (**12**) having a lamp bulb or vessel (**10**) of quartz glass, and a light source (**11**) which, in operation, emits radiation in the ultraviolet (UV) spectral range, located in said quartz glass bulb or vessel (**10**),

wherein the quartz glass of the bulb or vessel includes

a first doping material comprising cerium, absorbing UV radiation, and being stimulated to fluorescence within the visible spectrum by said UV radiation; and

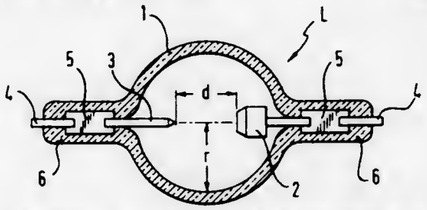
wherein the quartz glass of the bulb or vessel further includes a further doping material comprising praseodymium or a praseodymium compound, suppressing, or at least substantially attenuating said fluorescence of the quartz glass of the bulb or vessel (**10**).

5,589,735

EMISSION DEVICE WITH A CADMIUM LAMP

Akiyasu Yamaguchi; Yukio Yasuda; Tsuneo Okanuma; Tatsushi Igarashi; Hiromitsu Matsuno, all of Hyogo-ken, and Tatsumi Hiramoto, Tokyo, all of Japan, assignors to Ushiodenki Kabushiki Kaisha, Japan

Filed Jul. 25, 1995, Ser. No. 506,829
Claims priority, application Japan, Jul. 29, 1994, 6-196206
Int. Cl.[6] H01J *7/08;61/18*
U.S. Cl. 313—638 2 Claims



1. An emission device comprising a cadmium lamp having a fluorescent tube within which a cathode and an anode are spaced apart with respect to one another and a buffer gas for easier initiation of luminous operation and metallic cadmium in an amount per unit volume of the fluorescent tube of 1×10^{-4} g/cm^3 to 3×10^{-3} g/cm^3 are encapsulated, and a power source device for supplying electrical input between the cathode and the anode in an electrical input range from 0.5 kW to 5.0 kW and in accordance with the relationship:

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$6.03+2.79\ W \leq r \leq 40$

where the electrical input of the power source device into the cadmium lamp in steady-state luminous operation is designated W (kW) and a maximum inside radius of the fluorescent tube of the cadmium lamp is designated r (mm).

5,589,736

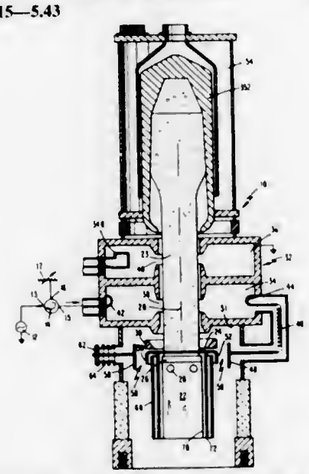
FREQUENCY MULTIPLIER INCLUDING GRID HAVING PLURAL SEGMENTS

Erling L. Lien, Los Altos, and Arthur Karp, Palo Alto, both of Calif., assignors to Communications and Power Industries, Inc., Palo Alto, Calif.

Division of Ser. No. 508,442, Apr. 13, 1990, Pat. No. 5,317,233. This application May 4, 1994, Ser. No. 237,731

Int. Cl.[6] H01J *25/02*

U.S. Cl. 315—5.43 **14 Claims**



1. Apparatus for multiplying the frequency of an AC signal by a factor N, where N is an integer greater than one, comprising an electron tube including a cathode for emitting an electron beam, a grid including N segments in proximity to the cathode and positioned to be responsive to the beam emitted by the cathode, the grid being electrically biased and electrically coupled to the signal for causing the beam to be configured as N groups of electron bunches during each cycle of the signal so that each of the segments accelerates one group of said N groups of electron bunches for a duration of about 1/N th of each cycle of the signal, different groups of said N groups of electron bunches associated with the different segments being accelerated at phases displaced from each other during each cycle of the signal, and means responsive to the N groups of bunches for deriving an output signal having a frequency N times that of the signal.

5,589,737

PLASMA PROCESSOR FOR LARGE WORKPIECES

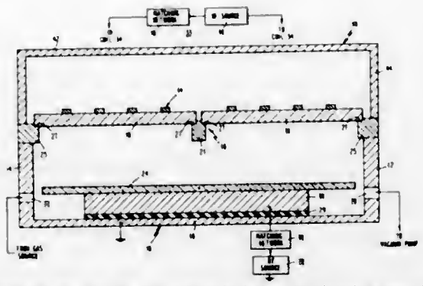
Michael Barnes, San Francisco; Neil Benjamin, E.P.A.; John Holland, Santa Clara; Richard Beer, Sunnyvale, and Robert Veltrop, Saratoga, all of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed Dec. 6, 1994, Ser. No. 354,122

Int. Cl.[6] H01J *7/24*

U.S. Cl. 315—111.21 **36 Claims**

1. A device for treating a workpiece with a plasma comprising a vacuum chamber in which the workpiece is adapted to be mounted, means for introducing into the chamber a gas which can be converted into the plasma for treating the workpiece, means for



converting the gas into the plasma including an electric source for producing an r.f. field originating outside of the chamber, plural individually supported dielectric windows on an exterior surface of the chamber positioned to couple the r.f. field to the gas so the field coupled through the windows excites the plasma, the windows having a thickness substantially less than the thickness of a single window having the same combined area as the plural windows to withstand the differential pressure between the interior and exterior of the chamber.

5,589,738

FIELD EMISSION TYPE DISPLAY DEVICE

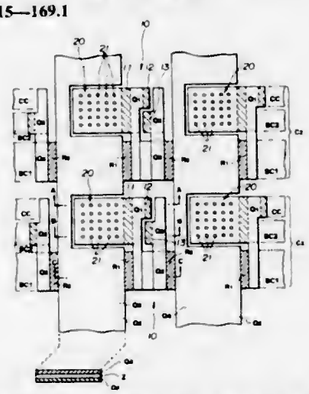
Koji Onodaka; Katsuya Hiraga; Yoichi Kobori; Hiroshi Sakurada; Teruo Watanabe, and Shigeo Itoh, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Continuation of Ser. No. 359,827, Dec. 20, 1994. This application Dec. 22, 1994, Ser. No. 361,582

Claims priority, application Japan, Dec. 20, 1993, 5-344482; Dec. 22, 1993, 5-345610; Dec. 22, 1993, 5-345612

Int. Cl.[6] G09G *3/10*

U.S. Cl. 315—169.1 **7 Claims**



1. A field emission type display device having a plurality of field emission cathode elements each including at least cathode electrodes, control electrodes and focus electrodes incorporated therein, comprising:

image cell sections each including a first field emission cathode element which forms one image cell so as to emit electron to an anode electrode; and

data holding sections each arranged for each of said image cell sections and formed by a second field emission cathode element so as to permit electrons to be emitted from said cathode electrodes to said focus electrodes by field emission in response to application of a voltage to said control electrodes;

said control electrodes of said field emission cathode element of each of said image cell sections being fed with data held in each of said data holding sections.

5,589,739

HYBRID BALLAST FOR HIGH PRESSURE DISCHARGE LAMP

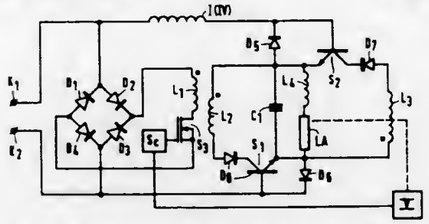
Hendrikus M. W. Goossens, Oss, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1995, Ser. No. 516,806

Claims priority, application European Pat. Off., Aug. 24, 1994, 94202427

Int. Cl.[6] H05B *37/00*

U.S. Cl. 315—176 **20 Claims**



1. A circuit arrangement for operating a discharge lamp, comprising:

input terminals for connection to a supply voltage source,

means coupled to the input terminals for generating a low-frequency alternating current from a supply voltage delivered by the supply voltage source,

means coupled to the input terminals for generating from the supply voltage a further current which is superimposed on the low-frequency alternating current, and

means for supplying said low-frequency alternating current and said superimposed further current to the discharge lamp such that the further current has the same polarity as the alternating current.

5,589,740

SEMICONDUCTOR-CONTROLLED OPERATING CIRCUIT FOR ONE OR MORE LOW-PRESSURE DISCHARGE LAMPS, TYPICALLY FLUORESCENT LAMPS

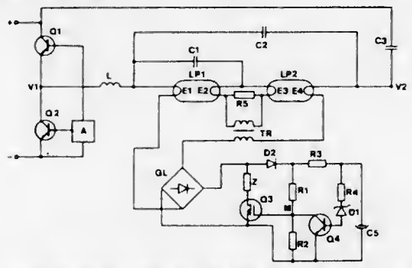
Bernd Rudolph, and Alwin Veser, both of Munich, Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen mbH, Munich, Germany

Filed Jun. 27, 1995, Ser. No. 495,803

Claims priority, application Germany, Jul. 21, 1994, 44 25 859.3

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—291 **16 Claims**



1. Semiconductor-controlled operating circuit for at least one low-pressure discharge lamp (LP1, LP2; LP'; LP"), in which said at least one lamp has heatable lamp electrodes (E1, E2, E3, E4; E1', E2'; E1", E2"), comprising

an inverter (Q1, Q2, A; Q1', Q2', A'; Q1", Q2", A") adapted to be coupled to a source of direct-current energy, and including an inverter control circuit (A, A', A");

a resonance circuit coupled to the inverter (Q1, Q2, A; Q1', Q2', A'; Q1", Q2", A") and including at least one resonance inductance (L, L', L") and a resonance capacitance (C2, C2', C2");

at least one heater circuit coupled to the heatable electrodes (E1, E2, E3, E4; E1', E2'; E1", E2") of the at least one low-pressure lamp for preheating the electrodes thereof; and

a semiconductor switch (Q3, Q3', Q3") having its main switching path (drain-source) connected into the heater circuit and, in dependence on the switched state of said semiconductor switch, switching the heating circuit between a low-resistance and a high-resistance state,

said operating circuit further comprising, in accordance with the invention,

an impedance element (Z, Z', Z") connected in at least one of the at least one heater circuit, and in series with the main switching path of the semiconductor switch (Q3, Q3', Q3"); and

a control connection between said impedance element (Z, Z', Z") and a control terminal of the semiconductor switch (Q3, Q3', Q3") for controlling said semiconductor switch in accordance with the voltage drop across the combination of the impedance element (Z, Z'.Z") and the main switching path of the semiconductor switch,

said impedance element (Z, Z', Z") and main switching path combination providing a voltage drop which, when the semiconductor switch is in low-resistance state, is sensed and coupled to the control terminal of the semiconductor switch to control said semiconductor switch (Q3, Q3', Q3") into low-resistance state.

5,589,741

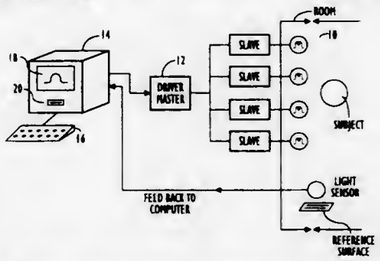
SYSTEM FOR CREATING NATURALISTIC ILLUMINATION CYCLES

Michael Terman; Stephen Fairhurst, both of New York, N.Y.; Philip Hughes, Lake Hopatcong, N.J., and Joel Levitt, Brooklyn, N.Y., assignors to Research Foundation For Mental Hygiene, Inc., Albany, N.Y., and Medic-Light Inc., Lake Hopatcong, N.J.

Continuation-in-part of Ser. No. 52,044, Apr. 22, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 229,533

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—360 **18 Claims**



1. A naturalistic illumination system for a user at a location comprising:

a light source for providing illumination of variable intensity above a non-zero value to said user location;

means including a computer having an input device for producing a variable signal to control a cycle of variable intensity illumination level output of said light source to correspond to the progressive variation in light level intensity above a non-zero value over a selected time of day period at a selected geographical location as selected from said input device,

said signal producing means operating on a daily basis to produce the variable intensity illumination cycle for the same

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period of time and including means for progressively shifting the time of the start of the production of the variable intensity illumination cycle for said period of time each day over a period of successive days relative to the normal time of start of the production of the variable intensity illumination cycle during said period of successive days at said selected geographical location.

5,589,742

DISCHARGING LAMP LIGHTING APPARATUS HAVING OPTIMAL LIGHTING CONTROL

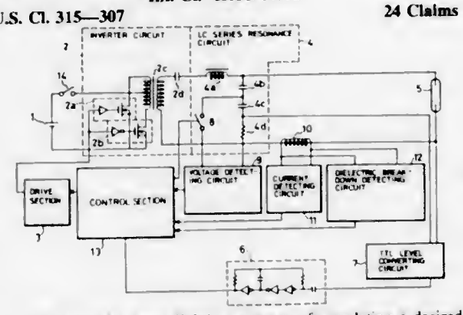
Hiroyuki Ueda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 47,484, Apr. 19, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 428,618

Claims priority, application Japan, Apr. 23, 1992, 4-129365; Sep. 22, 1992, 4-276791

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—307 **24 Claims**



1. A discharging lamp lighting apparatus for updating a desired voltage value to be applied to a discharging lamp when the discharging lamp is lighted at a rated power, each time the discharge light is lighted, comprising:

power supplying means for supplying power for said discharging lamp;

dielectric breakdown detecting means for detecting dielectric breakdown of said discharging lamp;

voltage detecting means for detecting voltage applied to said discharging lamp;

stable voltage storing means for storing the desired voltage value when said discharging lamp is stabilized; and

control means for providing said power supplying means with an instruction defining said desired voltage value previously stored in said stable voltage storing means as a target value when said dielectric breakdown detecting means detects occurrence of said dielectric breakdown of said discharging lamp, damping current flowing through said discharging lamp such that said voltage of said discharging lamp becomes said target value previously stored in said stable voltage storing means when power consumption of said discharging lamp becomes the rated power, and detecting voltage applied to said discharging lamp by said voltage detecting means, when said discharging lamp is stabilized, to update said desired voltage value stored in said stable voltage storing means.

5,589,743

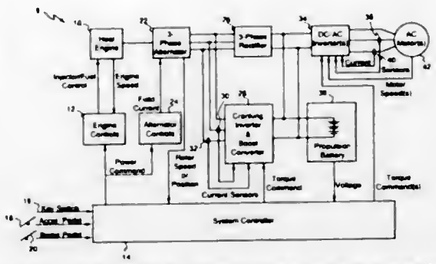
INTEGRATED CRANKING INVERTER AND BOOST CONVERTER FOR A SERIES HYBRID DRIVE SYSTEM

Robert D. King, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,266

Int. Cl.[6] B60L *11/08*

U.S. Cl. 318—139 **17 Claims**



1. An electric continuously variable drive system, comprising:

an ac motor;

an alternator for supplying electrical power to the ac motor via a rectifier and a drive inverter;

a heat engine for driving the alternator;

an energy storage device;

a combination cranking inverter and boost converter, the combination coupled in series between the alternator and the energy storage device and coupled substantially in parallel with the rectifier in a series hybrid drive.

5,589,744

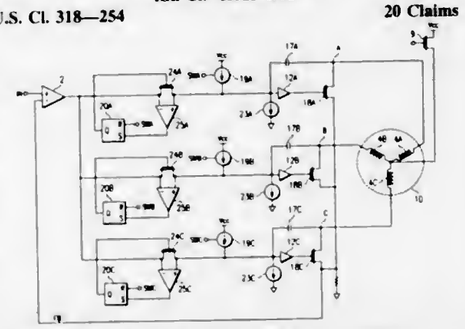
SLEW RATE CONTROL CIRCUIT FOR A LOWSIDE DRIVER OF A DC MOTOR

Massimiliano Brambilla, San Jose, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jul. 13, 1995, Ser. No. 502,124

Int. Cl.[6] H02P *6/02*

U.S. Cl. 318—254 **20 Claims**



1. A driver circuit for a polyphase DC motor, comprising:

an error amplifier, for generating at an output drive signal responsive to a command input signal and to a feedback signal;

a plurality of coil drive circuits, each corresponding to a coil of the motor, each coil drive circuit comprising:

a driver transistor having a conduction path connected to the corresponding coil, and having a control electrode;

a buffer amplifier having an input, and having an output coupled to the control electrode of the driver transistor;

a capacitor coupled between the input of the buffer amplifier and the conduction path of the driver transistor;

a first current source connected to the input of the buffer amplifier, for conducting a first current;

a switched current source, having a control electrode for receiving a commutation signal, for conducting a second current;

a switched transistor having a current path between the output of the error amplifier and the input of the buffer amplifier, the switched transistor having a control element,

an operational amplifier having an first input connected to the output of the error amplifier, having a second input connected to the input of the buffer amplifier, and having an output, and

a flip-flop having a first input connected to the output of the operational amplifier, having a second input for receiving the commutation signal, and having an output connected to the control element of the switched transistor.

5,589,745

DRIVE CIRCUIT FOR A BRUSHLESS DIRECT-CURRENT MOTOR

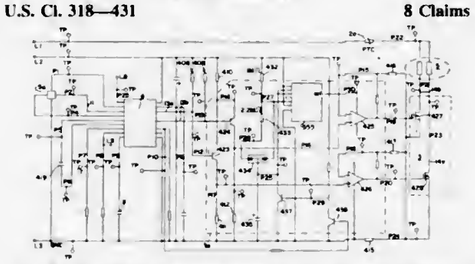
Helmut Hans, St. Georgen, and Mojtaba Moinl, Könisgfeld, both of Germany, assignors to Papst Licensing GmbH, Spaichingen, Germany

Division of Ser. No. 292,693, Aug. 18, 1994, which is a continuation of Ser. No. 76,720, Jun. 14, 1993, Pat. No. 5,343,129, which is a continuation of Ser. No. 932,737, Aug. 25, 1992, Pat. No. 5,220,258. This application Jun. 7, 1995, Ser. No. 473,930

Claims priority, application Germany, Jun. 18, 1990, 40 19 338.1

Int. Cl.[6] H02P *6/20*

U.S. Cl. 318—431 **8 Claims**



1. A restart circuit for a DC motor supplied with trigger pulses of a predetermined minimal rate, the restart circuit having an output signal of one predetermined voltage level in case the trigger pulses have a sufficient rate or frequency and another predetermined voltage level in case the trigger pulses have less than a predetermined frequency, the restart circuit comprising: a timing circuit coupling current to the DC motor; a second circuit comprising a capacitor, means for charging the capacitor, means for discharging the capacitor, including means for starting the discharging of the capacitor, and means for decoupling the charging means from the discharging means; and amplifying means coupled to the second circuit for producing the output signal.

5,589,746

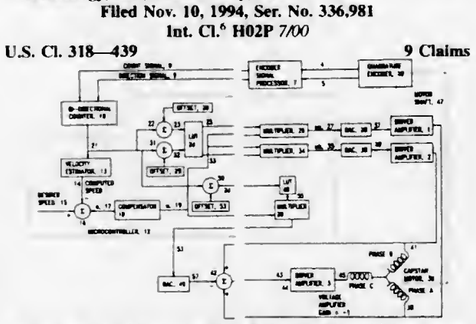
BRUSHLESS MOTOR SPEED CONTROL ARRANGEMENT HAVING DERIVED COMMON MODE SUPPLY SIGNAL COMPONENT

Martyn A. Lewis, Pacific Palisades, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 10, 1994, Ser. No. 336,981

Int. Cl.[6] H02P *7/00*

U.S. Cl. 318—439 **9 Claims**



1. A method of increasing the efficiency of a multiphase motor having a plurality of phase windings comprising the steps of:

(a) obtaining the voltage amplitude for each phase of said motor;

(b) determining the smallest voltage amplitude of the motor phase windings;

(c) generating a common mode voltage equal to one-half the absolute value of said smallest voltage amplitude;

(d) summing said common mode voltage with said voltages from each phase of said motor thereby creating a modified control voltage; and

(e) commutating said motor with said modified control voltage.

5,589,747

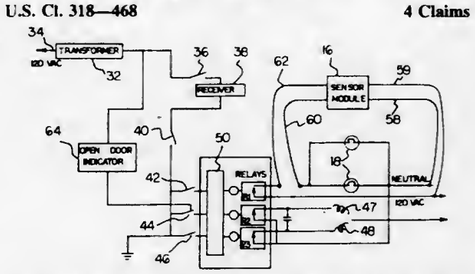
LIGHT AND MOTION GOVERNED GARAGE DOOR OPENER LAMP

Michael C. Utke, 3204 - 31st St., Lubbock, Tex. 79410

Filed Jul. 6, 1995, Ser. No. 498,626

Int. Cl.[6] E05F *15/20*

U.S. Cl. 318—468 **4 Claims**



1. A new and improved sensor actuated garage door opener light for sensing the local presence of a human form and actuating an illumination system when there is insufficient light comprising, in combination:

an electrically powered garage door opening and closing system including a garage door; a housing; a plurality of lamps; a transformer coupled to a conventional power receptacle and adapted to supply an acceptable amount of current to the system; a security switch coupled to the transformer with an open orientation for precluding operation of the system and a closed orientation for allowing normal operation thereof; a receiver switch coupled in series with the security switch and adapted to allow transmission of current upon receipt of a radio signal; a manual switch coupled in series with the receiver switch and adapted to allow transmission of current upon the manual activation thereof; an upper limit switch coupled in series with the manual switch and adapted to allow transmission of current when the garage door is open; a lower limit switch coupled in series with the manual switch and adapted to allow transmission of current when the garage door is closed; an obstruction switch coupled in series with the manual switch and adapted to allow transmission of current when the garage door is obstructed; a first relay that transmits a first electric signal upon the activation thereof; a second relay coupled to an upward motor to effect opening of the garage door upon the activation thereof; a third relay coupled to a downward motor to effect closing of the garage door upon the activation thereof; an integrated circuit coupled between the upper limit switch, lower limit switch, and obstruction switch and the first relay, second relay, and third relay, the integrated circuit adapted to activate the first relay, second relay, and third relays upon the receipt of current via the upper limit switch, lower limit switch, and obstruction switch thereby effecting normal operation of the garage door system; and

a sensor module including:

a sensor housing having a window that removes light at wavelengths not included in the infrared domain,

a plurality of passive monostatic infrared sensor elements disposed within the housing at a location near the window, the sensor elements capable of detecting the presence of

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one or more humans within a sensing range and producing a second electrical signal whenever one or more humans are detected,

a light sensor switch coupled to the motion sensor element and further coupled to the first relay via a relay control line, the light sensor switch having an open orientation when exposed to sufficient light for precluding the transmission of the first and second electric signals, the light sensor switch further having a closed orientation when exposed to insufficient light for allowing the transmission thereof,

temporal delay circuitry coupled to the light sensor switch and comprising an input power control line coupled to the power receptacle, an input neutral control line, and an output power control line coupled to the lamps of the garage door system, the temporal delay circuitry adapted to allow transmission of current between the input power control line and output power control line upon the receipt of the first or second electric signal thereby allowing independent actuation of the lamps upon the detection of humans or activation of the garage door system and precluding said actuation upon exposure to sufficient light, the temporal delay circuitry further adapted to remain activated for a predetermined amount of time despite the absence of motion, and

a rodlike member connected to the garage door system with a pivotal fulcrum wherein pivoting of the sensor housing is substantially in a vertical plane with the sensor element disposed in a first substantially horizontal direction and with the sensor element repositionable at any angle from the first substantially horizontal direction through a nadir passing through a pivotal axis and to a second substantially horizontal direction, and wherein rotation of the rodlike member is substantially within a horizontal plane positioned about a substantially vertical axis passing through the pivotal axis and with such rotation occurring through angles somewhat less than three hundred and sixty degrees, the rodlike member having an axially aligned conduit formed therein for containment of the input and output control lines.

5,589,748

POSITION CONTROL SYSTEM AND POSITION CONTROL METHOD THEREOF

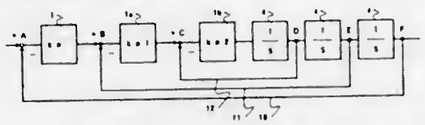
Tsutomu Kazama, and Mitsuyasu Kachi, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1994, Ser. No. 208,480

Claims priority, application Japan, Mar. 10, 1993, 5-049473

Int. Cl.[6] G06F *15/46*

U.S. Cl. 318—560 **11 Claims**



1. A position control system for feeding back position information detected by position detection means for detecting the position of a movable part, said position control system having first and second control loops coupled together to form a second order system position control loop, a transfer function of said second order system position control loop being defined by the equation:

$$G(S) = \frac{1}{\left(1 + \frac{1}{2kp} S\right)^2}$$

where S=a Laplace transform operator; and

kp=a first order loop gain, wherein 4 kp is equal to a second order loop gain.

5,589,749

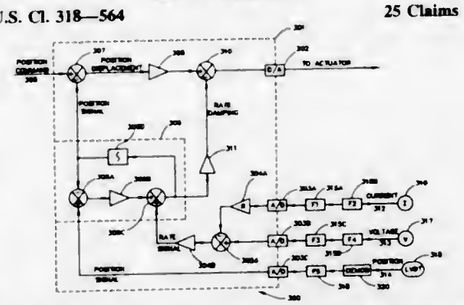
CLOSED LOOP CONTROL SYSTEM AND METHOD USING BACK EMF ESTIMATOR

Dale D. Davidson, Glendale, and Hamid R. Sadeghpour, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1994, Ser. No. 298,726

Int. Cl.[6] G05B *9/03*

U.S. Cl. 318—564 **25 Claims**



1. A feedback control system for controlling an actuator in response to a command signal, said control system comprising:

a) a first input for receiving said command signal;

b) a second input for receiving a current signal indicative of the current through said actuator;

c) a third input for receiving a voltage signal indicative of the voltage across said actuator;

d) a fourth input for receiving a position signal indicative of the position of said actuator;

e) a back EMF combiner having,

1) a first input in communication with said current signal,

2) a second input in communication with said voltage signal, and,

3) an output communicating a rate signal indicative of the rate of movement of said actuator;

f) a position command combiner having,

1) a first input in communication with said command signal,

2) a second input in communication with said position signal, and,

3) an output communicating a position displacement signal indicative of the difference between the signals received by said first input and said second input;

g) a displacement combiner having,

1) a first input in communication with said displacement signal,

2) a second input in communication with said rate signal, and,

3) an output communicating a rate error signal indicative of the difference between the signals received by said first input and said second input; and,

h) a filter, interposed between said back EMF combiner and said second input of said displacement combiner, said filter conditioning said rate signal so as to minimize the effect of motor impedance variations.

5,589,750

ACCELERATION/DECELERATION CONTROL APPARATUS FOR NUMERICAL CONTROL APPARATUS

Takashi Idei; Shoichi Sagara, both of Minamitsuru-gun, and Kentaro Fujibayashi, Musashino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

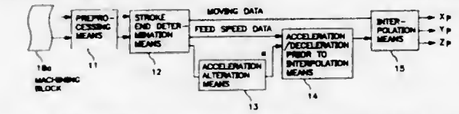
PCT No. PCT/JP94/00106, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO94/19730, PCT Pub. Date Sep. 1, 1994

PCT Filed Jan. 26, 1994, Ser. No. 307,808

Claims priority, application Japan, Feb. 23, 1993, 5-032921

Int. Cl.[6] G05B *19/416*

U.S. Cl. 318—573 **6 Claims**



1. An acceleration/deceleration control apparatus for a numerical control apparatus which controls a tool in a vicinity of a stroke end, comprising:

stroke end determination means for determining whether said tool moves beyond said stroke end by prereading a machining block before said tool reaches the vicinity of said stroke end;

tool feed speed control means for controlling a feed speed of said tool in response to said stroke end determination means such that the feed speed of said tool is reduced to a minute speed in the vicinity of said stroke end; and

interpolation means for determining first, second and third pulses, respectively supplied to first axis control means, second axis control means and third axis control means to thereby execute drive control of said tool.

5,589,751

SENSORLESS SWITCHED RELUCTANCE MOTOR

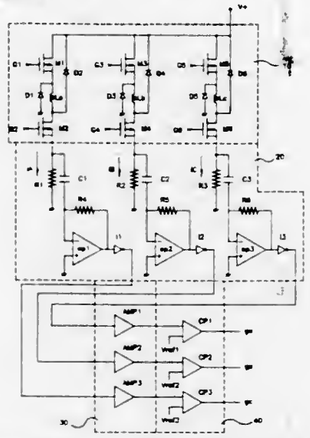
Jun Y. Lim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 16, 1993, Ser. No. 167,361

Claims priority, application Rep. of Korea, Dec. 17, 1992, 24724/1992; Dec. 17, 1992, 24725/1992; Jan. 29, 1993, 1155/1993

Int. Cl.[6] H02P *6/02*

U.S. Cl. 318—701 **3 Claims**



1. A switch for a sensorless switched reluctance motor comprising:

motor driving means for driving the motor by exciting phases of the motor with current in a predetermined sequence;

filtering means for filtering the current exciting the phases of the motor;

first amplifying means for amplifying output voltages from said filtering means to respective first proper levels;

first comparing means for comparing output voltages of said first amplifying means with first references voltages respectively, to generate a high level signal when the output voltage of said first amplifying means is higher than the respective first reference voltage and a low level signal when the output voltage of said first amplifying means is lower than the respective first reference voltage;

delaying means for delaying the output voltages from said filtering means for predetermined times;

second amplifying means for amplifying the output voltages from said delaying means to respective second proper levels;

second comparing means for comparing output voltages from said second amplifying means with second reference voltages respectively, to generate a high level signal when the output voltage of said second amplifying means is higher than the respective second reference voltage and a low level signal when the output voltage of said second amplifying means is lower than the respective second reference voltage; and

OR gating means for ORing the output signals from said first comparing means and the output signals from said second comparing means.

5,589,752

CONTROLLER FOR SWITCHED RELUCTANCE MOTOR

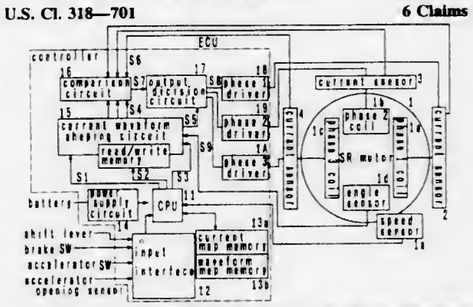
Shinichiro Iwasaki, Anjou; Masanori Sugiyama, Nishio; Chiaki Umemura, Toyohashi; Akemi Ookawa, Chita-gun, and Hisayoshi Takahashi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 25, 1995, Ser. No. 428,367

Claims priority, application Japan, Apr. 25, 1994, 6-086769

Int. Cl.[6] H02P *5/05*

U.S. Cl. 318—701 **6 Claims**



1. A controller for switched reluctance motor including means for detecting a rotational position of a rotor and in which an electrical coil which is used to drive the rotor is turned on or off at a particular rotational position of each pole on the rotor; characterized by

speed detecting means for detecting the rotational speed of the rotor; and

current waveform control means for modifying the current waveform as the current rises or falls to turn on or off the coil by modifying the current rising speed or the current falling speed in accordance with the rotational speed-of the rotor which is detected by the speed detecting means.

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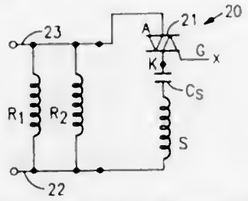
5,589,753

RATE EFFECT MOTOR START CIRCUIT

Andrew S. Kadah, 6333 Daedulus Dr., Cicero, N.Y. 13039, and Benjamin V. Morrow, Pennellville, N.Y., assignors to Andrew S. Kadah, Cicero, N.Y.

Filed Apr. 11, 1994, Ser. No. 225,581
Int. Cl.[6] H02P *1/42;1/44*
U.S. Cl. 318—785 **18 Claims**



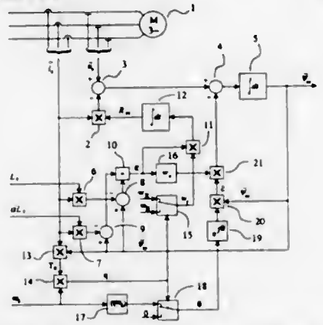
1. A motor start circuit for an AC induction motor, said motor including at least one run winding coupled between a pair of AC power conductors, and a start winding, said motor start circuit having first and second connection terminals only and which are connected in series with said start winding, with the first connection terminal being connected to one end of said start winding and the second connection terminal being connected to one of said AC power conductors, for applying AC current to said start winding upon commencement of an application of AC current to said run winding and for removing said AC current from said start winding when said AC induction motor reaches an operating speed; the motor start circuit comprising a triac device having a main current path connected in series with said start winding and said one AC power conductor, and including means to produce a low dv/dt characteristic in the triac device so that the commencement of the application of current causes said AC current to flow through said main current path.

5,589,754

METHOD FOR DETERMINING A STATOR FLUX ESTIMATE FOR AN ASYNCHRONOUS MACHINE

Samuli Heikkilä, Helsinki, Finland, assignor to ABB Industry Oy, Helsinki, Finland

PCT No. PCT/FI94/00071, § 371 Date Aug. 24, 1995, § 102(e) Date Aug. 24, 1995, PCT Pub. No. WO94/22213, PCT Pub. Date Sep. 29, 1994
PCT Filed Feb. 24, 1994, Ser. No. 507,413
Claims priority, application Finland, Mar. 17, 1993, 931186
Int. Cl.[6] H02P *5/28*
U.S. Cl. 318—805 **10 Claims**



1. A method for determining an estimate for the stator flux of an asynchronous machine when the supply frequency ω_s, stator inductance L_s, at least one of stator resistance R_s and an estimate R_{sr} therefor, ans short-circuit inductance σL_s are known, comprising the steps of:

measuring the stator current $\bar{i}_s$ and stator voltage $\bar{u}_s$,

calculating a difference voltage by subtracting at least one of the product of the stator resistance and the estimate thereof and the stator current from the stator voltage,

integrating said difference voltage in relation to time to give a stator flux estimate $\hat{\psi}_{sr}$,

subtracting, prior to said step of integrating a correction term based on the feedback stator flux estimate $\hat{\psi}_{sr}$ and being proportional to the product of the difference variable ϵ and the direction vector $\bar{C}$ given therefor, from said difference voltage,

determining said difference variable from the equation:

$$(\hat{\psi}_{sr}-L_s\bar{i}_s)(\hat{\psi}_{sr}-\sigma L_s\bar{i}_s)=\epsilon \text{ and}$$

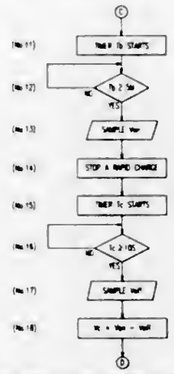
forming the direction vector $\bar{C}$ from the feedback stator flux estimate $\hat{\psi}_{sr}$ by turning it for the angle θ which is dependent on the operational mode of the machine.

5,589,755

METHOD AND APPARATUS FOR CHARGING A SECONDARY BATTERY

Osamu Kaite; Tatsuya Okada, and Toshiharu Kokuga, all of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 23, 1995, Ser. No. 392,658
Claims priority, application Japan, Feb. 24, 1994, 6-026623
Int. Cl.[6] H01M *10/44;10/46*
U.S. Cl. 320—21 **17 Claims**



8. A method of charging a secondary battery, comprising the steps of:

charging the secondary battery with a constant voltage to generate a charging current, the charging current decreasing as a function of time to a stable, low level of charging;

maintaining charging of the secondary battery until detecting a first occurrence when the charging current becomes smaller than a predetermined current value;

substantially reducing charging of the secondary battery on a first occasion in response to detecting the first occurrence when the charging current becomes smaller than the predetermined current value, the predetermined current value being higher than the stable, low level of charging current;

sampling an open circuit voltage of the secondary battery while the charging is substantially reduce; and

controlling charging according to the sampled open circuit voltage.

16. An apparatus for charging a secondary battery, the apparatus comprising:

charging means for charging the secondary battery with a charging current at a substantially constant voltage;

current detecting means responsive to the charging current for generating a signal after detecting a first occurrence when the charging current becomes smaller than a predetermined value;

controlling means responsive to the signal for substantially reducing the charging current, and wherein the controlling means maintains the charging until the first occurrence of when the charging current becomes smaller than the predetermined value; and

sampling means for sampling an open circuit voltage of the secondary battery while reducing the charging current;

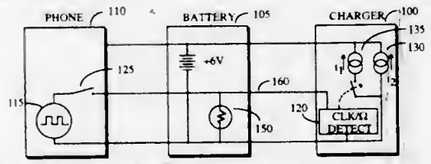
wherein the controlling means is responsive to the sampled open circuit voltage for controlling the charging current.

5,589,756

BATTERY CHARGER HAVING A MULTIPLE FUNCTION SENSE LINE

Nathaniel B. Wilson, 11346-8 Portobelo, San Diego, Calif. 92124, and Elbert A. McLaren, II, 11291 Paul Barwick Ct., San Diego, Calif. 92126

Filed Nov. 29, 1994, Ser. No. 346,960
Int. Cl.[6] H02J *7/00*
U.S. Cl. 320—22 **7 Claims**



1. A battery charging system having at least a first and a second charging mode, the system charging a battery in a battery powered device having at least a first and a second operating mode, the battery charging system comprising:

a battery charger for charging the battery;

a clock signal generator coupled to the battery charger by a multiple function conductor, the clock signal generator impressing a first clock signal on said multiple function conductor during the first operating mode and impressing a second clock signal on said multiple function conductor during the second operating mode;

a temperature sensing device, coupled to the multiple function conductor, for sensing a temperature of the battery;

a clock detection circuit, coupled to the multiple function conductor, for detecting the first clock signal and the second clock signal;

a temperature detection circuit, coupled to the multiple function conductor, for detecting the temperature of the battery over said multiple function conductor in response to the temperature sensing device; and

a variable current source for generating a first current in the first charging mode when the first clock signal is detected and a second current in the second charging mode when the second clock signal is detected.

5,589,757

APPARATUS AND METHOD FOR STEP-CHARGING BATTERIES TO OPTIMIZE CHARGE ACCEPTANCE

James K. Klang, Rosemount, Minn., assignor to GNB Battery Technologies, Inc., Mendota Heights, Minn.

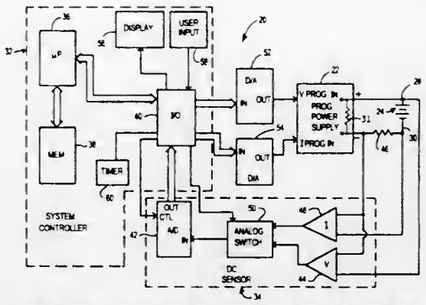
Continuation-in-part of Ser. No. 188,957, Jan. 26, 1994. This application Jun. 7, 1995, Ser. No. 480,828
Int. Cl.[6] H02J *7/04;* **H01M** *10/44*
U.S. Cl. 320—22 **45 Claims**

19. An apparatus for charging a battery, comprising:

a controllable power source providing an electrical charging output at variable current or voltage levels;

means for connecting the power source to charging terminals of the battery;

control circuitry for controlling the power source to apply the electrical charging output to the battery at a plurality of levels with respect to a base charging level, including charging



output levels comprising an upper pair and a lower pair of spaced-apart charging levels;

a sensor for measuring charging input to the battery at each charging level comprising one of said pairs and providing charging input values corresponding thereto;

arithmetic means for calculating a lower differential from the difference in the charge inputs at the two charging levels comprising the lower pair of charging levels, and for calculating an upper differential from the difference in the charge inputs at the two charging levels comprising the upper pair of charging levels; and

comparison circuitry for comparing the lower and upper differentials with one another and providing a comparison result, the comparison circuitry being operatively connected to provide the comparison result to the control circuitry, the control circuitry increasing or decreasing the base charging level in dependence on the comparison result.

36. A method of charging a battery, comprising the steps of:

outputting a charging voltage to the battery in dependence on a base voltage level;

adjusting the charging voltage in steps of predetermined magnitudes to provide first, second and third voltage levels, wherein the first level is less than the second level and the second level is less than the third level;

measuring first, second and third currents at the first, second and third voltage levels, respectively;

calculating a first differential from the difference in the first current from the second current, and calculating a second differential from the difference in the second current from the third current;

comparing the first differential and the second differential; and

increasing the base voltage a selected increment amount if the first differential is greater than the second differential, or decreasing the base voltage a selected decrement amount if the first differential is less than the second differential.

5,589,758

MODULAR, HYBRID POWER SYSTEM

James B. Blackmon, Brownsboro, Ala.; Robert E. Drubka, Huntington Beach, Calif.; Nelson E. Jones, Los Osos, Calif.; R. Andrew Gerrick, Santa Ana, Calif., and Michael L. Hand, Huntington Beach, Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Sep. 7, 1993, Ser. No. 116,852
Int. Cl.[6] H02P *9/00*
U.S. Cl. 322—100 **16 Claims**

1. A power system, comprising:

a turbogenerator system;

a low voltage amplifier;

an amplifier fuel cell connected to said low voltage amplifier for supplying electrical power thereto;

a medium voltage amplifier connected to said turbogenerator system for receiving high voltage electrical power therefrom; and

a high voltage amplifier connected to said turbogenerator system for receiving high voltage electrical power therefrom, said

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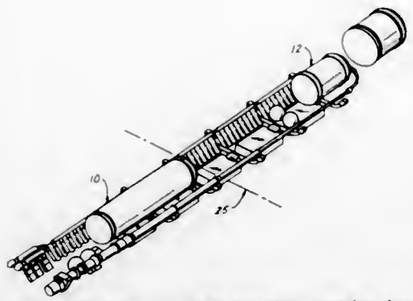


high, medium and low voltage amplifiers supplying electrical power at selected radio frequencies to an electrical system.

5,589,759

CIRCUIT FOR DETECTING VOLTAGE VARIATIONS IN RELATION TO A SET VALUE, FOR DEVICES COMPRISING ERROR AMPLIFIERS

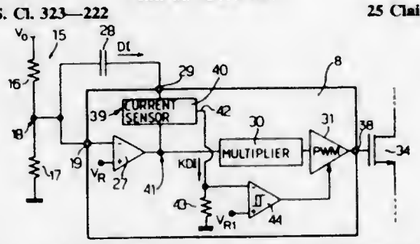
Pierandrea Borgato, Lomagna; Claudio Diazzi, Milan, and Albino Pidutti, Udine, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jul. 30, 1993, Ser. No. 100,482

Claims priority, application European Pat. Off., Jul. 30, 1992, 92830428

Int. Cl.[6] G05F *1/63*

U.S. Cl. 323—222 **25 Claims**



1. A circuit for detecting voltage variations of an output terminal in relation to a set value, said circuit comprising an error amplifier, having an amplifier input connected to the output terminal and an amplifier output for supplying an error signal, said circuit also comprising a feedback branch connected between said amplifier input and said amplifier output of said error amplifier, said circuit further comprising a current sensor connected to the feedback branch, the current sensor detecting a current through the feedback branch, said current being proportional to the voltage variations of the output terminal and said current sensor generating a signal proportional to the voltage variations at the output terminal.

5,589,760

TRAVELLER'S VOLTAGE CONVERTER FOR AUTOMATICALLY SELECTING LOAD WATTAGE

Anthony Lee, C/O Hung Hsing Service Center P.O. Box 55-1670, Taipei, Taiwan

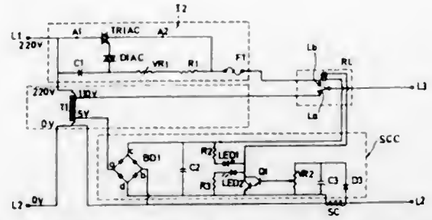
Filed Sep. 5, 1995, Ser. No. 523,354

Int. Cl.[6] G05F *1/12*

U.S. Cl. 323—247 **3 Claims**

1. A voltage converter for traveller's uses for automatically selecting load wattage comprising:

a low-wattage transformer for converting an input voltage of 220 volts AC across a hot input terminal and a neutral terminal to an output voltage of 110 volts AC across a hot output terminal and the neutral terminal for powering a low-wattage load connected across said hot output terminal and said neutral terminal;



a high-wattage transformer for converting an input voltage of 220 volts AC across said hot input terminal and said neutral terminal to an output voltage of 110 volts AC across said hot output terminal and said neutral terminal to obtain an output power rating of wattage value greater than that of said low-wattage transformer for powering a high-wattage load connected across said hot output terminal and said neutral terminal;

a sensing control circuit connected between said low-wattage transformer and said neutral terminal, and operatively sensing an induced current signal from a lead of said neutral terminal when led to a high-wattage load; and

a relay connected to said sensing control circuit and normally connecting a first contactor of said low-wattage transformer with said hot output terminal, and operatively actuated by said induced current signal from said sensing control circuit for switching on a second contactor of said high-wattage transformer to connect the hot output terminal with the high-wattage transformer for powering the high-wattage load when connected between said hot output terminal and said neutral terminal.

5,589,761

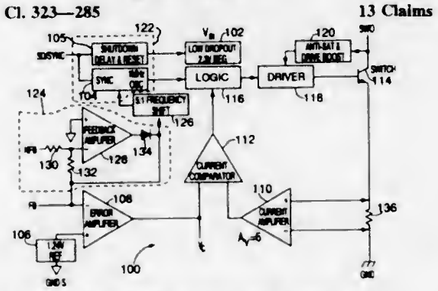
DUAL POLARITY VOLTAGE REGULATOR CIRCUITS AND METHODS FOR PROVIDING VOLTAGE REGULATION

Carl T. Nelson, San Jose, and Robert Essaff, Fremont, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Continuation of Ser. No. 228,478, Apr. 15, 1994. This application Jun. 7, 1995, Ser. No. 472,538

Int. Cl.[6] G05F *1/575*

U.S. Cl. 323—285 **13 Claims**



1. A dual polarity voltage regulator circuit comprising:

negative feedback network means;

error amplifier means coupled to the negative feedback network means;

positive regulator network means coupled to the error amplifier means and to the negative feedback network means; and

negative regulator network means coupled to the error amplifier means and to the negative feedback network means, such that:

when positive voltages are being regulated by the voltage regulator, the error amplifier means provides a feedback signal to the voltage regulator and the negative regulator network is deactivated; and

when negative voltages are being regulated by the voltage regulator, the error amplifier means and the negative regulator network operate together to provide a feedback signal to the voltage regulator.

5,589,762

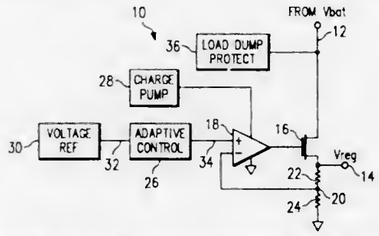
ADAPTIVE VOLTAGE REGULATOR

James M. Iannuzo, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 74,132, Jun. 8, 1993, abandoned, which is a continuation of Ser. No. 659,248, Feb. 22, 1991, abandoned. This application Sep. 1, 1994, Ser. No. 299,815

Int. Cl.[6] G05F *1/64*

U.S. Cl. 323—351 **18 Claims**



15. A controller for providing a continuously variable regulated power supply voltage, comprising:

a source voltage;

a reference voltage;

means for sensing a voltage at an output node;

means for comparing the reference voltage to the sensed voltage, and for, if the sensed voltage falls below a value determined by the reference voltage, connecting said source voltage to the output node, and for, if the sensed voltage rises above the value determined by said reference voltage, disconnecting said source voltage from the output node; and

means for automatically adjusting an output voltage on said output node by increasing said reference by a continuously variable amount in response to a continuously varying input signal indicating that a higher voltage is desired on the output node, wherein the increase in said output voltage is functionally related to the increase in said reference voltage.

5,589,763

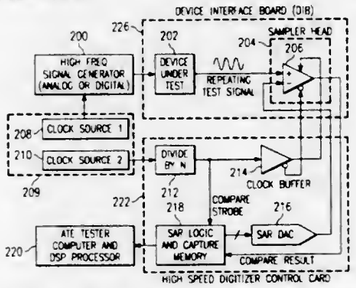
COHERENT UNDERSAMPLING DIGITIZER FOR USE WITH AUTOMATIC FIELD TEST EQUIPMENT

Mark A. Burns, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 16, 1995, Ser. No. 442,538

Int. Cl.[6] G01R *13/34*

U.S. Cl. 324—76.15 **7 Claims**



1. An apparatus for measuring a repetitive test waveform in a coherent manner, comprising:

a signal generating circuit to generate and output said repetitive test waveform in accordance with first clock signals;

a first clock circuit coupled to said signal generating circuit to output said first clock signals at a first clock frequency;

a strobed comparator to sample the repetitive test signal in accordance with second clock signals and to output a one-bit comparison result signal;

a second clock circuit coupled to strobed comparator circuit to output said second clock signals at a second clock frequency;

a processor coupled to said first clock circuit and said second clock circuit to determine a frequency ratio between said first clock frequency and said second clock frequency, said processor using frequency ratio for producing S sampling point signals evenly spaced across said repetitive test waveform;

a successive approximation digital to analog converter for providing a comparison level to said strobed comparator and to receive said S sampling point signals;

said processor to generate and provide successive approximation values to said successive approximation routine digital to analog converter;

waveform capture memory to store said one bit comparison result signal for subsequent retrieval and refinement by successive approximation routine logic, said waveform capture memory and said successive approximation routine logic collecting one bit at a time from each digitized sample from said S sampling point signals, all most significant bits MSB's first, all least significant bits LSB's last, resulting in a digitized waveform corresponding to said repetitive test waveform.

5,589,764

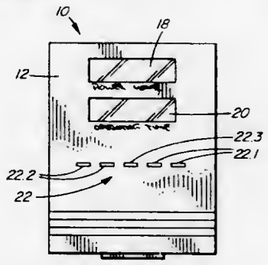
METER FOR MEASURING ACCUMULATED POWER CONSUMPTION OF AN ELECTRICAL APPLIANCE DURING OPERATION OF THE APPLIANCE

Graham S. Lee, 760 Fairmile Rd., West Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 196,556, Feb. 15, 1994, which is a continuation of Ser. No. 664,888, Mar. 5, 1991, Pat. No. 5,315,236. This application Oct. 3, 1994, Ser. No. 320,409

Int. Cl.[6] G01R *22/00;21/00;* **G07C** *1/00*

U.S. Cl. 324—157 **8 Claims**



1. An electric power meter, comprising:

a body member;

prongs on said body member for insertion into an electric socket;

a second socket on said body member for receiving the plug of an electric appliance, said second socket being in electrical communication with said prongs for transferring electric power from said prongs to said second socket;

current measuring means in said body member for measuring the total accumulated electric current flow between said prongs and said second socket on said body member during actual operation of said electrical appliance;

a timer for measuring the duration of said electric current flow;

processing means associated with said body member for receiving data from said current measuring means to calculate electric power consumed from said data; and

display means associated with said body member for displaying measurement results of the power meter thereon; said dis-

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played measurement results comprising electric power consumed and the time period during which the appliance is in actual operation and said power has been so consumed.

5,589,765

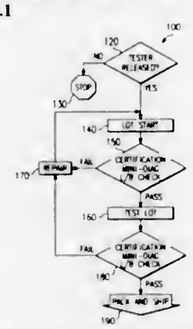
METHOD FOR FINAL TESTING OF SEMICONDUCTOR DEVICES

Dale V. Ohmart, Fulshear; Willie B. Benitez, III, Wylie, both of Tex.; Deogracias D. Marrero, Baguio City, Philippines, and Douglas J. Mirizzi, Rosenberg, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1995, Ser. No. 368,683

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—158.1 **18 Claims**



1. A method for final testing a lot consisting of a predetermined plurality of semiconductor devices, comprising the steps of:

testing operation of a test system relative to a predetermined set of test system performance characteristics;

if said test system fails to operate in accordance with said predetermined set of test system performance characteristics, repairing said test system and retesting operation of said test system until said test system operates in accordance with said predetermined set of test system performance characteristics;

certifying that said test system is operating in accordance with said predetermined set of test system performance criteria;

testing a plurality of semiconductor device performance characteristics of each of said lot of semiconductor devices with said test system, said testing resulting in passing semiconductor devices operating in accordance with said plurality of semiconductor device performance characteristics and failing semiconductor devices not operating in accordance with said plurality of semiconductor device performance characteristics;

subsequent to said testing of said lot of semiconductor devices, testing operation of said test system relative to said predetermined set of test system performance characteristics;

if said test system fails to operate in accordance with said predetermined set of test system performance criteria subsequent to said testing of said lot of semiconductor devices

repairing said test system and retesting operation of said test system until said test system operates in accordance with said predetermined set of test system performance characteristics,

following repair of said test system restarting testing each of said lot of semiconductor devices and subsequent to said restart of testing of said lot of semiconductor devices retesting operation of said test system;

if said test system operates in accordance with said predetermined set of test system performance criteria subsequent to said testing of said lot of semiconductor devices, recertifying that said test system is operating in accordance with said predetermined set of test system performance criteria; and

packing and shipping said passing semiconductor devices.

5,589,766

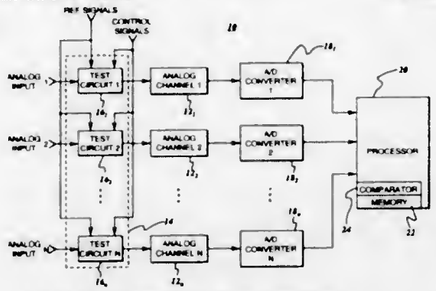
FIELD-TESTABLE INTEGRATED CIRCUIT AND METHOD OF TESTING

Paul A. Frank, Albany; Donald T. McGrath, and Daniel A. Staver, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 6, 1995, Ser. No. 417,576

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—158.1 **8 Claims**



1. A field-testable integrated circuit comprising:

a plurality of analog signal channels for receiving a respective analog signal during a normal mode of operation;

signal processing means coupled to said plurality of analog signal channels for utilizing the analog signals received by said plurality of analog signal channels; and

circuit means for selecting respective ones of said plurality of channels to receive a predetermined reference instead of said respective analog signal during a test mode of operation while permitting the normal mode of operation to continue uninterruptedly in any remaining unselected channels in said integrated circuit.

5,589,767

MECHANISM FOR THE ATTACHMENT OF A SPEED SENSOR TO A TRAIN WHEEL INCLUDING A BEARING AND A CONNECTION LINK WITH A SHOCK ABSORBING BUSHING

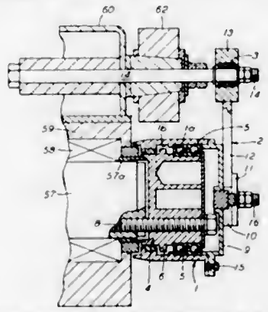
Osamu Akamatsu, Akashi, Japan, assignor to NABCO Ltd., Kobe, Japan

Filed Apr. 5, 1994, Ser. No. 223,390

Claims priority, application Japan, Apr. 6, 1993, 5-105055

Int. Cl.[6] G01P *3/48;* **G01R** *33/02;* **B61L** *11/08*

U.S. Cl. 324—173 **4 Claims**



1. A mechanism for attaching a speed sensor to a railway vehicle comprising:

(a) a rotary body for abutting attachment to an end face of a wheel axle and disposed in a nonsurrounding relationship to such wheel axle such that said rotary body rotates with such wheel axle, said rotary body having an outer peripheral surface, said outer peripheral surface having a gear wheel with teeth;

(b) a sensor mounting body within which said rotary body rotates;

(c) a speed sensor attached to said sensor mounting body and aligned opposite to said gear wheel with teeth of said rotary body, said teeth providing the change in magnetic field sensed by said speed sensor when said rotary body is rotating with such wheel axle so that said speed sensor generates a signal corresponding to the rotational speed of such wheel axle;

(d) a bearing disposed between said rotary body and said sensor mounting body such that said bearing maintains a predetermined gap between said speed sensor and said gear wheel with teeth; and

(e) a connection link through which said sensor mounting body is connected to a frame of such vehicle, said connection link comprising a displacement absorption means for preventing transmission of vibration from both such vehicle frame and such wheel axle to said speed sensor attachment mechanism so as to protect said speed sensor attachment mechanism from damage.

5,589,768

MAGNETORESISTANCE-EFFECT MAGNETIC SENSOR OF THE TEMPERATURE COMPENSATING TYPE

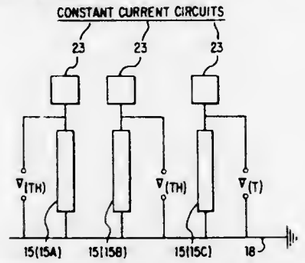
Noritaka Ishiyama, Tokyo, and Koutarou Kobayashi, Yamanashi-ken, both of Japan, assignors to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 976,984, Jan. 22, 1993, abandoned. This application Jun. 23, 1994, Ser. No. 264,211

Claims priority, application Japan, Jul. 30, 1990, 2-199123; Dec. 25, 1990, 2-412876

Int. Cl.[6] G01R *33/09;* **G01B** *7/14;* **G11B** *5/39;* **H01L** *43/08*

U.S. Cl. 324—207.21 **2 Claims**



1. A magnetoresistance-effect magnetic sensor for sensing a magnetic pattern on a magnetic medium comprising:

at least first and second devices having respective first and second current paths each with first and second ends, said first and second devices being formed in a magnetoresistance-effect thin film layer;

said thin film layer of said first and second devices consisting essentially of a Fe-Ni alloy having a rate of decrease of the magnetoresistance-effect with temperature and a rate of increase of intrinsic resistance with temperature that are substantially equal;

said first and second devices being arranged in 180 degree shifted positions with respect to the magnetic pattern to be detected such that said first device senses a first portion of the magnetic pattern and said second device senses a second portion of the magnetic pattern wherein the second portion is 180° out of phase with respect to the first portion as determined by a periodicity of the magnetic pattern;

first and second constant current sources, each serially connected to first ends of said first and second devices respectively to supply constant currents therethrough and to generate respective first and second potentials across said first and second devices, said first device and first constant current source and said second device and second current source being arranged in parallel with said second ends of said first and second devices connected to a common potential, wherein a difference between said first and second potentials is compensated for temperature effects and varies in accordance with said magnetic pattern.

5,589,769

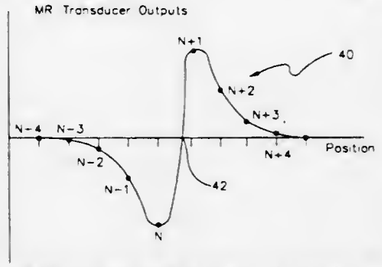
POSITION DETECTION APPARATUS INCLUDING A CIRCUIT FOR RECEIVING A PLURALITY OF OUTPUT SIGNAL VALUES AND FITTING THE OUTPUT SIGNAL VALUES TO A CURVE

Donald R. Krahn, Eagan, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1994, Ser. No. 324,182

Int. Cl.[6] G01B *7/02;* **G01D** *5/16;5/246*

U.S. Cl. 324—207.26 **15 Claims**



1. Apparatus for determining a position of a member movable along a defined path, comprising:

means for producing a magnetic field attached to said member;

an array of magnetic field transducers located adjacent said defined path, each transducer comprising magnetoresistive material and providing a bipolar output signal as said means for producing a magnetic field approaches, passes and moves away from said each transducer, with said magnetic field of sufficient strength to saturate said magnetoresistive material;

said array of transducers providing a plurality of output signal values for a first position of said means for producing a magnetic field; and

electronic means for receiving said plurality of output signal values and fitting said plurality of output signal values to a first curve and using a crossover point of said first curve to determine said first position.

5,589,770

MECHANICAL SENSOR FOR DETECTING STRESS OR DISTORTION WITH HIGH SENSITIVITY

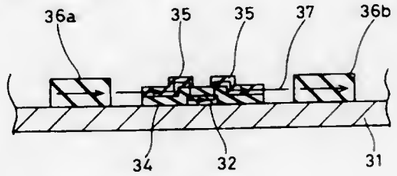
Shinji Saitou, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 23, 1995, Ser. No. 494,221

Claims priority, application Japan, Jun. 27, 1994, 6-144436

Int. Cl.[6] G01L *1/00*

U.S. Cl. 324—209 **18 Claims**



1. A mechanical sensor, comprising:

a first ferromagnetic layer having magnetostriction;

a second ferromagnetic layer, separate from the first ferromagnetic layer, and having magneto-resistance effect;

a magnetic field generating means for exciting said first and second ferromagnetic layers; and

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a substrate which integrally support said first and second ferromagnetic layers and said magnetic field generating means, wherein a change of a magnetic flux density passing through said first and second ferromagnetic layers resulting from a change of magnetic properties due to stress is detected as a change of resistance value arising from the magnetoresistance effect.

5,589,771

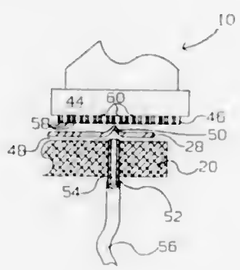
MAGNETIC MEDIA HEAD DYNAMIC TESTING APPARATUS AND METHOD WHICH OPERATE BY DEFORMING A LOCALIZED PORTION OF MAGNETIC MEDIA TOWARD THE HEAD ELEMENT

Sung P. Chur, Palo Alto, Calif., assignor to Swan Instruments, Inc., Santa Clara, Calif.

Filed Oct. 24, 1994, Ser. No. 328,062

Int. Cl.[6] G01R *33/12*

U.S. Cl. 324—212 **17 Claims**



1. A method for testing, prior to final assembly of hard disk drives, a magnetic head element of the type used for reading rigid media, comprising:

placing the magnetic head element in proximity to a flexible magnetic medium disk;

causing said flexible magnetic medium disk to move in relation to a stationary stabilizer plate;

deforming a localized portion of the flexible magnetic medium disk toward, but not into actual contact with, the magnetic head element; wherein

said deforming is accomplished without physical contact of a solid body with said flexible magnetic medium disk; and

testing the magnetic head element.

5,589,772

NON-DESTRUCTIVE EDDY CURRENT SENSOR HAVING A SQUID MAGNETIC SENSOR AND SELECTIVELY POSITIONABLE MAGNETS

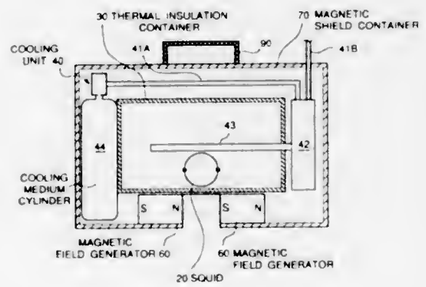
Hirokazu Kugai, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1994, Ser. No. 273,947

Claims priority, application Japan, Jul. 12, 1993, 5-195125; Dec. 27, 1993, 5-348837

Int. Cl.[6] G01N *27/82;* **G01C** *21/08*

U.S. Cl. 324—240 **14 Claims**



1. A non-destructive testing equipment comprising:

a magnetic shield container defining a magnetically stable inspection zone where an object to be tested is to be positioned for testing and said magnetic shield container having a magnetically transparent opening adjacent said inspection zone;

a magnetic field generator attached to said magnetic shield container, for generating a stable magnetic field in said inspection zone;

a magnetic sensor located in said magnetic shield container and including at least one SQUID, for detecting, through said opening, the magnetic field in said inspection zone;

means provided to said magnetic shield container, for cooling said magnetic sensor,

means for allowing the testing equipment to move in relation to and along an object to be tested, and means for maintaining a distance between said magnetic sensor and the object to be tested at a constant value;

wherein said cooling means includes a thermal insulation container accommodating said magnetic sensor therein and filled with a cooling medium for cooling said magnetic sensor to a temperature not higher than a superconducting critical temperature; and

wherein said magnetic field generator includes at least one pair of permanent magnets which are so constructed and arranged to be selectively positioned in a first orientation in which said at least one pair of permanent magnets are located in parallel to each other but opposed in polarity to each other so that said at least one pair of permanent magnets are magnetically strongly bonded to each other and no substantial magnetic field is generated in the outside of said at least one pair of permanent magnets magnetically bonded to each other, and in a second orientation in which said at least one pair of permanent magnets are located in parallel to each other and in the same polarity direction, so that said at least one pair of permanent magnets are magnetically strongly repelled from each other, and the at least one pair of permanent magnets in said second orientation generate a substantial magnetic field outside of the said at least one pair of permanent magnets.

5,589,773

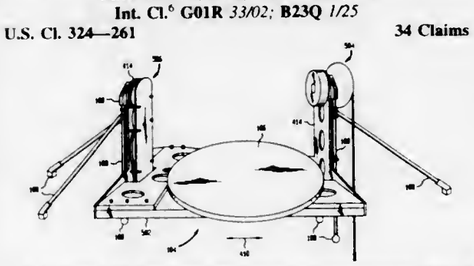
SYSTEM AND METHOD FOR MAKING ELECTROMAGNETIC MEASUREMENTS USING A TILTABLE TRANSVERSE ELECTROMAGNETIC CELL AND A FIXED TILT SAMPLE HOLDER

H. Stephen Berger, Georgetown; Martha L. Vela de Casillas, Austin, and Harry L. Cochrane, Liberty Hill, all of Tex., assignors to Siemens Rolm Communications Inc., Santa Clara, Calif.

Filed Oct. 12, 1994, Ser. No. 321,699

Int. Cl.[6] G01R *33/02;* **B23Q** *1/25*

U.S. Cl. 324—261 **34 Claims**



1. A system for obtaining electromagnetic measurements from a test object, comprising:

a hollow cell for inserting the test object,

said hollow cell comprising an electromagnetically conductive material for conducting electromagnetic radiation generated by the test object, and being tiltable about at least one axis, said at least one axis being perpendicular to the direction of the force of gravity;

a table rotatable about its vertical axis within said hollow cell, the test object being positioned upon said table; and

a fixed tilt mechanism for maintaining said table in a fixed tilt position relative to said at least one axis as said hollow cell is tilted about said at least one axis perpendicular to the direction of the force of gravity.

5,589,774

Patent Not Issued For This Number

5,589,775

ROTATING MAGNET FOR DISTANCE AND DIRECTION MEASUREMENTS FROM A FIRST BOREHOLE TO A SECOND BOREHOLE

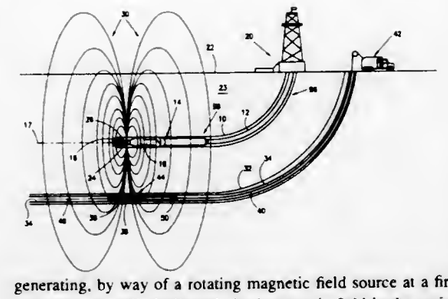
Arthur F. Kuckes, Ithaca, N.Y., assignor to Vector Magnetics, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 155,529, Nov. 22, 1993, abandoned. This application Dec. 5, 1995, Ser. No. 567,578

Int. Cl.[6] G01V *3/26;3/20;3/40;* **G01R** *33/04*

U.S. Cl. 324—346 **32 Claims**

1. A method for determining the direction from a magnetic field source to an observation point, comprising:



generating, by way of a rotating magnetic field source at a first location, an elliptically polarized magnetic field in the region of an observation point;

measuring, by first and second sensors at said observation point the amplitude and relative phase of respective first and second perpendicular vector components of said ellipticity polarized rotating magnetic field; and

determining from said measurements the direction, relative to said sensors, from said observation point to said first location.

5,589,776

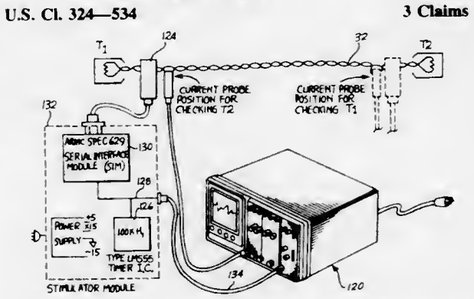
NON-INTRUSIVE TESTING OF A TERMINAL RESISTOR

David G. Morant, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 173,328, Dec. 23, 1993. This application Jun. 6, 1995, Ser. No. 469,303

Int. Cl.[6] G01R *31/11*

U.S. Cl. 324—534 **3 Claims**



1. A method of non-intrusive testing of a terminal resistor on a data bus, comprising:

inserting a signal having an amplitude that varies over time onto said data bus adjacent one end thereof by magnetically coupling a signal generator to said data bus and producing a signal of known repetition rate and amplitude in said data bus;

electronically observing any reflected signal, having an amplitude that varies over time, produced by a reflection of said signal from the end of said data bus;

comparing the amplitude over time of said signal with the amplitude over time of said reflected signal to determine if said signal and said reflected signal are in phase or out of phase; and

determining from the amplitude over time of said reflected signal and from whether said signal and said reflected signal are in phase or out of phase, or the absence of said reflected signal, whether said terminal resistor is correctly sized and correctly installed.

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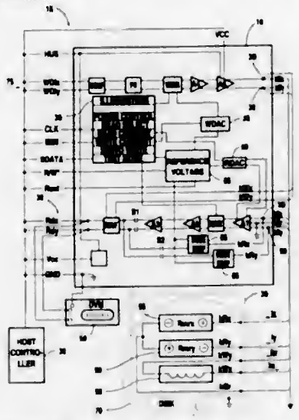
5,589,777

CIRCUIT AND METHOD FOR TESTING A DISK DRIVE HEAD ASSEMBLY WITHOUT PROBING

Bradley K. Davis, Meridian, Id.; Johannes O. Voorman, Geldrop; Joao N. V. L. Ramalho, Eindhoven, both of Netherlands, and Patrice Gamand, Douvres-la-delivrande, France, assignors to Hewlett-Packard Company, Palo Alto, Calif., and Philips Electronics N.V., Netherlands

Filed Jun. 21, 1995, Ser. No. 493,384
Int. Cl.[6] G01R *31/02;31/302*
U.S. Cl. 324—537 20 Claims



1. A preamplifier circuit for a data storage system, the data storage system including at least one read head element and at least one write head element, the preamplifier circuit comprising:

(a) means for forcing a write current generated by preamplifier circuit through the at least one write head element, the write current being responsive to a write data signal received and processed by the preamplifier circuit;

(b) means for presenting a read data signal at an output means of the preamplifier circuit, the read data signal being responsive to a read current generated by the preamplifier circuit through the at least one read head element;

(c) input means for receiving a test mode signal indicative of a test mode for identifying and initiating testing of selected circuitry associate with the preamplifier circuit or the data storage system;

(d) means, electrically connected to the input means, responsive to the test mode signal for initiating a controlled test current in the identified selected circuitry; and,

(e) means for presenting an output signal at the output means of the preamplifier circuit, the output signal being responsive to the controlled test current and indicative of electrical properties, including resistance, of the identified selected circuitry.

5,589,778

SENSOR DRIVE CIRCUIT

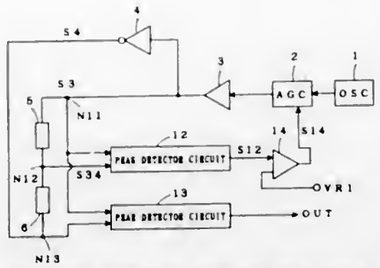
Yukio Ono, and Seiichiro Kikuyama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 419,697
Claims priority, application Japan, May 20, 1994, 6-106597
Int. Cl.[6] G01R *27/28*
U.S. Cl. 324—654 24 Claims

1. A sensor drive circuit comprising:

a reference sensor having first and second ends and including a first coil of a fixed inductance;

a variable sensor including a second coil of a variable inductance, said second coil being connected in series with said first coil;



amplitude control means receiving a first signal from a side of the first end of said reference sensor and a second signal from a side of the second end thereof for controlling an amplitude of a difference signal between said first and second signals so as to be held constant; and

inductance detection signal output means for outputting an inductance detection signal responsive to the amount of variation in the inductance of said second coil of said variable sensor,

said amplitude control means including:

peak detecting means receiving said first and second signals for detecting a peak value of said difference signal to output a peak detection signal; and

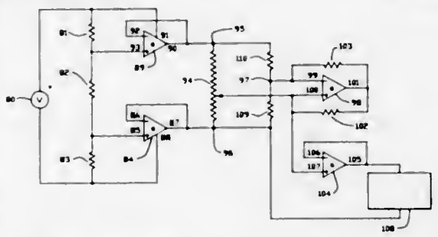
signal applying means receiving said peak detection signal for applying a signal to said first and second coils so that amplitudes of said first and second signals are varied in response to said peak detection signal.

5,589,779

POTENTIOMETER CIRCUIT PROVIDING IDENTIFIABLE OPEN WIPER SIGNALS

Eric S. Micko, Rescue, Calif., assignor to Qualimetrics, Inc., Sacramento, Calif.

Filed Jan. 24, 1994, Ser. No. 184,980
Int. Cl.[6] G01R *27/08*
U.S. Cl. 324—714 7 Claims



1. A circuit, comprising:

a signal source;

a first conducting element having a first contact coupled to the signal source and having a second contact coupled to the signal source;

a second conducting element having a first contact coupled to the first conducting element, providing a first signal corresponding to a position of the second conducting element relative to the first conducting element during a decoupling of the second conducting element first contact from the first conducting element;

means, coupled to the second conducting element, for providing a second signal corresponding to the second conducting element first contact position during the decoupling responsive to the first signal, wherein the means for providing includes:

means, coupled to the second conducting element, for sensing the first signal; and,

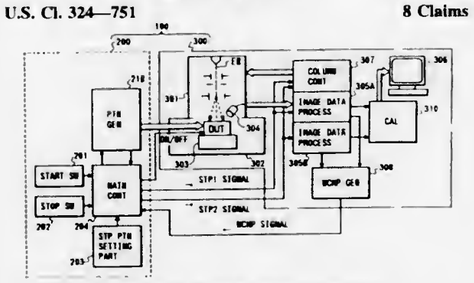
means, coupled to the sensing means, for driving the first signal to a reference signal level.

5,589,780

IC ANALYSIS SYSTEM AND ELECTRON BEAM PROBE SYSTEM AND FAULT ISOLATION METHOD THEREFOR

Koshi Ueda, Machida; Akira Goishi, Kazo, and Masayuki Kuribara, Gyoda, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

Division of Ser. No. 181,584, Jan. 14, 1994, Pat. No. 5,528,156. This application Sep. 30, 1994, Ser. No. 312,953
Claims priority, application Japan, Jul. 30, 1993, 5-190431; Jul. 30, 1993, 5-190449; Sep. 21, 1993, 5-257624
Int. Cl.[6] G01R *31/305*
U.S. Cl. 324—751 8 Claims



1. An integrated circuit analysis system comprising:

an electron beam probe system which scans and irradiates a surface of a device under test with an electron beam, measures a quantity of secondary emission from an irradiated point, and displays a potential distribution on the surface of said device under test; and

an integrated circuit tester which applies a test pattern signal comprising a series of test patterns to said device under test, said IC tester comprising:

a test pattern generator which generates a test pattern signal comprising a series of test patterns and sequentially updates and applies the test patterns of said test pattern signal to said device under test,

stop pattern setting means for setting therein at least a first test pattern and a second test pattern among the test patterns of said test pattern signal as update stopping test patterns for temporarily stopping said test pattern generator from updating one of said first test pattern and said second test pattern generated by said test pattern generator, respectively, and

main control means for controlling, when said test pattern generator generates one of said first test pattern and said second test pattern, said test pattern generator to temporarily stop from updating said one test pattern and to hold said test pattern generator in a state of continuing to output said one test pattern being applied to said device under test, and concurrently outputting a first pattern update stop signal representing a pause of the test pattern updating operation of said test pattern generator when said test pattern generator generates said first test pattern as well as outputting a second pattern update stop signal representing a pause of the test pattern updating operation of the said test pattern generator when said test pattern generator generates said second test pattern; and

said electron beam probe system comprising:

at least two image data processing means each of which acquires an image data from the surface of said device under test on receiving one of said first pattern update stop signal and said second pattern update stop signal from said main control means;

calculating means for calculating a difference between said image data acquired by said at least two image data processing means; and

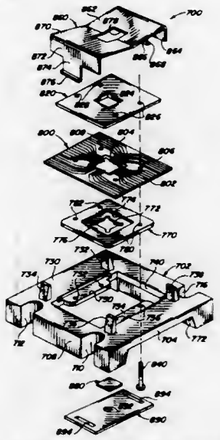
a monitor displaying image data of said difference calculated by said calculating means.

5,589,781

DIE CARRIER APPARATUS

H. Dan Higgins, 323 E. Redfield Rd., Chandler, Ariz. 85225, and Peter Normington, 516 Country Plz. South, Gilbert, Ariz. 85234

Continuation-in-part of Ser. No. 775,914, Oct. 15, 1991, Pat. No. 5,521,518, which is a continuation-in-part of Ser. No. 585,939, Sep. 20, 1990, abandoned. This application May 12, 1993, Ser. No. 60,757
Int. Cl.[6] G01R *1/073*
U.S. Cl. 324—755 23 Claims



1. Carrier apparatus for supporting an integrated circuit die for testing the die comprising in combination:

carrier block means comprising a base for receiving and supporting an integrated circuit die to be tested;

probe card means disposed on the carrier block means for testing the integrated circuit die, including

a substrate,

an aperture extending through the substrate,

a plurality of conductive traces, each comprising two portions, a first portion on the substrate and a second portion extending beyond the substrate and into the aperture and terminating in a tip for contacting the integrated circuit die for testing, the second portion comprising a probe needle extending from the first portion;

an alignment plate disposed on the carrier block means for aligning the probe card means and the integrated circuit die;

support plate means for supporting the integrated circuit die relative to the carrier block means and the probe card means; and

means for securing the carrier block means, the probe card means, the alignment block and the support plate means with the integrated circuit die together for testing the integrated circuit die.

5,589,782

MACROCELL AND CLOCK SIGNAL ALLOCATION CIRCUIT FOR A PROGRAMMABLE LOGIC DEVICE (PLD) ENABLING PLD RESOURCES TO PROVIDE MULTIPLE FUNCTIONS

Bradley A. Sharpe-Geisler, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 2, 1995, Ser. No. 458,865
Int. Cl.[6] H03K *19/173*
U.S. Cl. 326—38 36 Claims

1. A macrocell and block clock/control circuit for a programmable logic device, the macrocell receiving a data signal at a data input from a sum of product terms output of an OR gate and block

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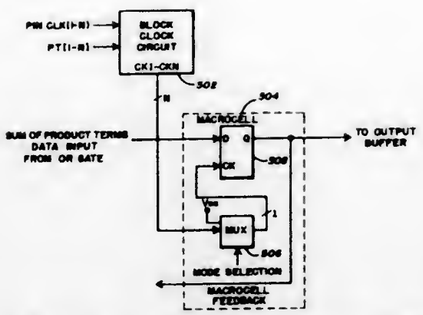


clock signals from outputs of the block clock/control circuit, wherein the macrocell comprises:

a storage element having a data input for receiving the data signal, a clock input, and an output, the storage element configured for providing a data signal received at its data input to its output as controlled by a signal received at its clock input; and

a multiplexer having first inputs connected to the block clock/control circuit outputs to receive the block clock signals, a second input connected to receive a select signal, and an output connected to the clock input of the storage element, the multiplexer configured for providing one of the block clock signals at its output as selected by the select signal, and

wherein the block clock/control circuit comprises circuit elements configured for providing the block clock signals to selectively enable operation modes in a group consisting of two or more different ones of the following: a latch mode; a single edge D-type flip-flop mode; a dual edge D-type flip-flop mode, a reset mode; a preset mode; and a mixed clock mode.

5,589,783

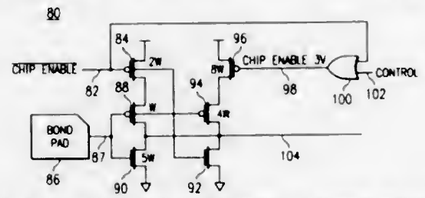
VARIABLE INPUT THRESHOLD ADJUSTMENT

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jul. 29, 1994, Ser. No. 282,177

Int. Cl.[6] H03K *19/0948*

U.S. Cl. 326—71 **24 Claims**



1. An integrated circuit device having a variable trip point adjustment, comprising:

a programmable input buffer of an integrated circuit device, wherein the integrated circuit device has a supply voltage; and

a control input signal to the programmable input buffer, wherein when the control input signal is equal to a first logic level, a first trip point of the integrated circuit device is defined, and when the control input signal is equal to a second logic level, a second trip point of the integrated circuit device is defined, wherein a chip enable signal of the integrated circuit device may determine whether the control input signal is equal to the first logic level or the second logic level,

wherein the programmable input buffer is comprised of a bond pad, a logic gate, a first transistor having a first source/drain, a second source/drain, and a gate, a second transistor having a first source/drain, a second source/drain, and a gate, a third transistor having a first source/drain, a second source/drain, and a gate, a fourth transistor having a first source/drain, a second source/drain, and a gate, a fifth transistor having a first source/drain, a second source/drain, and a gate, and a sixth transistor having a first source/drain, a second source/drain, and a gate; and

wherein the chip enable signal controls the gate of the first transistor and the gate of the sixth transistor; wherein a bond pad signal generated by the bond pad controls the gate of the second transistor, the gate of the third transistor, and the gate of the fifth transistor; wherein the chip enable signal is a first input signal to the logic gate, the control input signal is a second input signal to the logic gate, and the logic gate generates a derivative chip enable signal which controls the gate of the fourth transistor; and

wherein the first source/drain of the first transistor and the first source/drain of the fourth transistor are connected to a first supply voltage; the second source/drain of the third transistor and the second source/drain of the sixth transistor are connected to a second supply voltage; the second source/drain of the first transistor is connected to the first source/drain of the second transistor; the second source/drain of the second transistor, the first source/drain of the third transistor, the second source/drain of the fifth transistor, and the first source/drain of the sixth transistor are connected together to form an output signal; and the second source/drain of the fourth transistor is connected to the first source/drain of the fifth transistor.

5,589,784

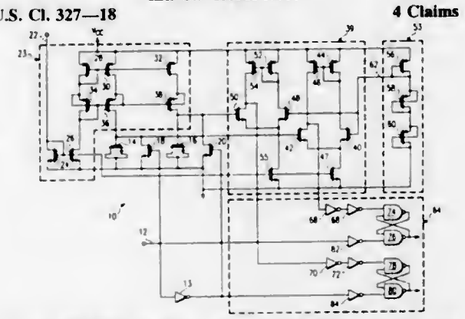
METHOD AND APPARATUS FOR DETECTING CHANGES IN A CLOCK SIGNAL TO STATIC STATES

Sabrina D. Phillips, Garland, and James R. Hellums, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 237,949, May 2, 1994, abandoned, which is a continuation of Ser. No. 861,721, Mar. 31, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 310,354

Int. Cl.[6] H03K *5/153*

U.S. Cl. 327—18 **4 Claims**



1. An integrated circuit for detecting changes in a clock signal from a first static state to at least a second static state comprising:

charging circuitry;

a first capacitor means coupled to said charging circuitry, said charging circuitry operable to linearly charge said first capacitor means in response to the clock signal changing to the first static state;

a first differential pair having a first reference voltage input, a first input, and a first output, said first capacitor means coupled to said first input, and said first reference voltage input coupled to a first reference voltage signal, such that a first output level is generated at said first output in response to said first capacitor means being charged to a voltage equal to or greater than said first reference voltage signal, said first capacitor means further being discharged responsive to said clock signal changing to the second static state;

a second capacitor means coupled to said charging circuitry, said charging circuitry operable to linearly charge said second capacitor means in response to said clock signal changing to the second static state; and

a second differential pair having a second reference voltage input, a second input, and a second output, said second capacitor means coupled to said second input, said second reference voltage input coupled to a second reference voltage signal, such that a second output level is generated at said second output in response to said second capacitor means being charged to a voltage equal to or greater than said second reference voltage signal, said second capacitor means further being discharged responsive to said clock signal changing to the first static state.

5,589,785

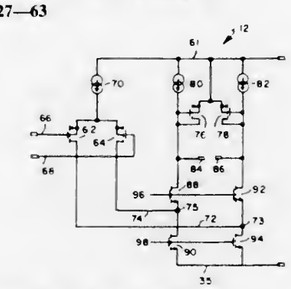
LOW-VOLTAGE CMOS COMPARATOR

Patrick J. Garavan, Limerick, Ireland, assignor to Analog Devices, Inc., Norwood, Mass.

Division of Ser. No. 235,557, Apr. 29, 1994. This application Jun. 7, 1995, Ser. No. 474,532

Int. Cl.[6] H03K *5/22*

U.S. Cl. 327—63 **37 Claims**



1. A comparator gain stage, comprising:

a differential pair input circuit comprising first and second input devices, the first input device being placed in a first electrical path between a supply voltage and a first output node, the second input device being placed in a second electrical path between the supply voltage and a second output node;

a first cascode device in a third electrical path between the supply voltage and the first output node, the third electrical path being distinct from the first and second electrical paths;

a second cascode device in a fourth electrical path between the supply voltage and the second output node, the fourth electrical path being distinct from the first and second electrical paths;

a first diode-connected load device in the third path and a second diode-connected load device in the fourth path, said first and second diode-connected load devices being responsive to the input devices and the cascode devices; and

fifth and sixth current paths parallel to the diode-connected load devices.

5,589,786

HIGH-SPEED CMOS DRIVER FOR OPTICAL SOURCES

Valter Bella, and Paolo Pellegrino, both of Turin, Italy, assignors to Cselt- Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Jun. 1, 1995, Ser. No. 456,712

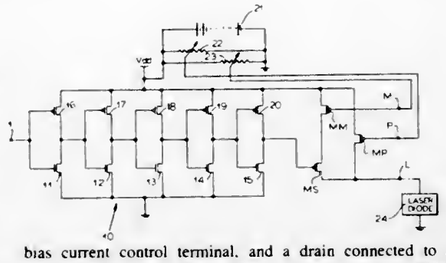
Claims priority, application Italy, Jun. 6, 1994, TO94A0462

Int. Cl.[6] H03K *3/42*

U.S. Cl. 327—108 **6 Claims**

1. A CMOS driver for an optical device, comprising:

a bias current generator formed by a transistor having a source connected to a power supply terminal, a gate connected to a bias current control terminal, and a drain connected to a terminal of an optical device to be driven whereby a bias current is supplied to said optical device;



a modulation current generator for supplying a modulation current to said optical device and comprising a pair of series-connected transistors, a first transistor of said pair having a drain connected to said terminal of said optical device to be driven, a gate, and a source connected to a drain of a second transistor of said pair, said second transistor of said pair having a source connected to said power supply terminal, and a gate connected to a modulation current control terminal; and

a cascade of CMOS inverter stages having an input terminal receiving digital signals and an output connected to said gate of said first transistor of said pair, said bias current and said modulation current having values depending only upon voltages applied to said bias current control terminal and applied to said modulation current control terminal and said input terminal, respectively.

5,589,787

CELL FOR SHIFT REGISTER

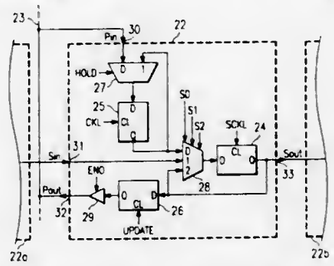
Charles Odinot, La Trouche, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France

Filed May 18, 1995, Ser. No. 443,808

Claims priority, application France, May 20, 1994, 94 06491

Int. Cl.[6] H03K *3/289*

U.S. Cl. 327—202 **29 Claims**



1. A cell for a shift register designed for the injection, into a transmission line, of a binary value or for the sampling of the value of the signal present in said line, this cell comprising:

a parallel input connected to the line to receive a parallel input signal (Pin),

a parallel output connected to the line to give a parallel output signal (Pout),

a series input to receive a series input signal (Sin) to be shifted into a following cell or to be injected into the line,

a series output to give a series output signal (Sour) to a series input of a following cell,

wherein the parallel input and the parallel output are connected and wherein the parallel output is separated from the rest of the cell by a tristate buffer circuit.

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5,589,788

TIMING ADJUSTMENT CIRCUIT

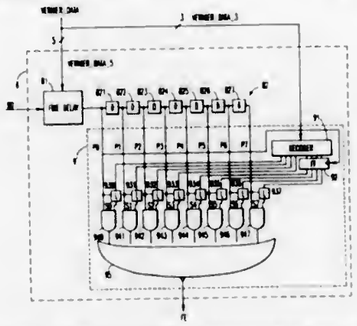
Masaharu Goto, Hannou, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 5, 1995, Ser. No. 435,877

Claims priority, application Japan, May 12, 1994, 6-124173

Int. Cl.[6] H03K *5/135*

U.S. Cl. 327—276 **6 Claims**



1. A timing adjustment circuit for receiving an input signal **p0** and comprising:

delay means including n serially connected delay elements, wherein n is an integer equal to or greater than two, and outputting n+1 signals to be selected, a first one of said n+1 signals to be selected being said input signal **p0** which is, in turn, delayed in sequence by each serially connected delay element to generate the rest of said signals to be selected p1, . . . pn;

a selection signal generation circuit for generating n+1 selection signals **s0**, . . . , sn, before said input signal **p0** is input to said delay means;

a delay signal holding circuit;

a selection gate circuit connected to said delay means and further connected, via said delay signal holding circuit, to said selection signal generation circuit and comprising n+1 selection gates, wherein pairs of said signals to be selected and said selection signals, **p0** and **s0**, p1 and s1, . . . , pn and sn, are applied as inputs to respective selection gates and one of said signals to be selected **p0**, . . . , pn from a selected selection gate is output;

said delay signal holding circuit comprising n+1 delay signal holding elements further connected to said delay means and responsive to said signals to be selected **p0**, p1, . . . , pn for holding active states of said selection signals **s0**, . . . , sn from said selection signal generation circuit as output states to said n+1 selection gates until initial input states of said signals to be selected **p0**, p1, . . . , pn become inactive.

5,589,789

BUS DRIVER CIRCUIT FOR HIGH-SPEED DATA TRANSMISSION

Hiroshi Kamiya, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 17, 1994, Ser. No. 323,776

Claims priority, application Japan, Oct. 16, 1993, 5-281904; Oct. 26, 1993, 5-266821; Dec. 29, 1993, 5-352432

Int. Cl.[6] H03H *11/26*

U.S. Cl. 327—278 **2 Claims**

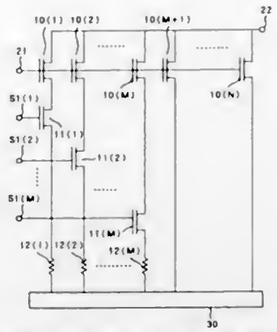
1. A bus driver circuit comprising:

a plurality of first transistors connected between a data input terminal and a data output terminal, and

a plurality of controlling transistors;

wherein sources of said plurality of first transistors are connected to drains of said plurality of controlling transistors; and

wherein gates of said plurality of controlling transistors are connected to receive control signals for selectively turning



ON and OFF said plurality of controlling transistors to vary an impedance on said output terminal,

wherein said plurality of first transistors comprise MOS transistors and said plurality of controlling transistors comprise MOS transistors,

wherein N of said plurality of first transistors and M of said plurality of controlling transistors are provided, in which M is smaller than N;

wherein drains of first to Nth of said plurality of first transistors are connected to the data output terminal, and gates of said first to Nth of said plurality of first transistors are connected to said data input terminal;

sources of first to Mth of said plurality of controlling transistors are connected to resistors, and source of (M+1)th to Nth first transistors are connected to ground;

gates of the first to Mth of said plurality of controlling transistors are connected to control signals to respectively receive first to Mth control signals for turning ON and OFF the first to Mth controlling transistors; and

drains of said first to Mth of said plurality of controlling transistors are connected to a corresponding source of one of said plurality of first transistors.

5,589,790

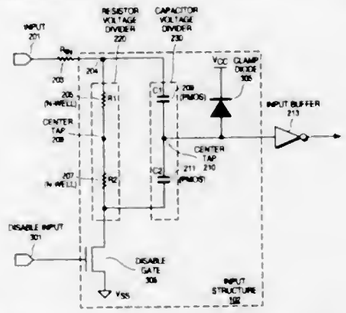
INPUT STRUCTURE FOR RECEIVING HIGH VOLTAGE SIGNALS ON A LOW VOLTAGE INTEGRATED CIRCUIT DEVICE

Michael J. Allen, Rescue, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1995, Ser. No. 496,872

Int. Cl.[6] H03K *19/0175;* **G06F** *13/00*

U.S. Cl. 327—333 **3 Claims**



1. An input structure fabricated on a digital integrated circuit (IC) having internal logic operating with a low voltage logic level range, the input structure for adapting the digital IC to receive a legacy signal having a high voltage logic level range, the input structure comprising:

a first node that receives the legacy signal;

a resistor voltage divider coupled to the first node that divides the legacy signal to the low voltage logic level range at a first center tap;

a capacitor voltage divider coupled to the first node and having a second center tap coupled to the first center tap;

a diode that clamps the center taps to approximately a supply voltage, the diode being coupled between the center taps and the supply voltage;

a transistor coupled in series with the resistor voltage divider, the transistor having a gate that controls a current flow therethrough; and

wherein the first and second center taps are coupled to the internal logic of the digital IC such that the legacy signal, at the low voltage logic level range, is transmitted to the internal logic effectively without delay.

5,589,791

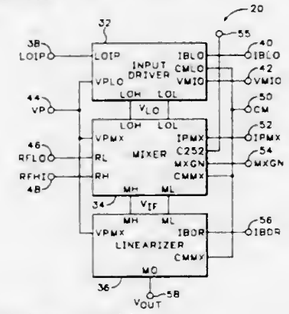
VARIABLE GAIN MIXER HAVING IMPROVED LINEARITY AND LOWER SWITCHING NOISE

Barrie Gilbert, Portland, Oreg., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jun. 9, 1995, Ser. No. 489,129

Int. Cl.[6] G06G *7/16*

U.S. Cl. 327—359 **36 Claims**



1. A mixer circuit, comprising:

a mixer for mixing a first signal received on a first differential input and a second input signal received on a second differential input, the mixer having first and second outputs forming a differential output for providing a mixer output signal responsive to the first and second input signals, the mixer having a linear transconductance within a given operating range and a nonlinear transconductance outside the given operating range; and

a post-mixer linearizer circuit having a differential input coupled to the differential output of the mixer and an output for providing a linearized mixer output signal, the post-mixer linearizer circuit including:

a first output driver having a first input coupled to the first output of the mixer, a second input, and an output coupled to the output of the post-mixer linearizer for providing a first half of the linearized mixer output signal,

a second outout driver having a first input coupled to the second output of the mixer, a second input, and an output coupled to the output of the post-mixer linearizer for providing a second half of the linearized mixer output signal,

a first diode having an anode coupled to the first mixer output and a cathode connected to the second input of the second output driver, wherein the first diode reduces a signal level at the second input of the second output driver responsive to an increase in a signal level at the first mixer output,

a first current source connected to the cathode of the first diode,

a second diode having an anode coupled to the second mixer output and a cathode connected to the second input of the first output driver, wherein the second diode reduces a signal level at the second input of the first output driver responsive to an increase in a signal level at the second mixer output, whereby the linearized mixer output signal has improved linearity over the output signal of the mixer, and

a second current source connected to the cathode of the second diode.

5,589,792

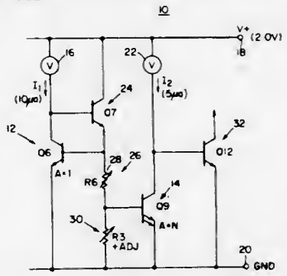
RESISTOR PROGRAMMABLE TEMPERATURE SWITCH

A. Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Apr. 19, 1995, Ser. No. 423,828

Int. Cl.[6] H01L *35/00;* **G05F** *1/10;3/16*

U.S. Cl. 327—512 **6 Claims**



1. A resistor programmable temperature switch for indicating that a preselected trip temperature has been reached, comprising:

first and second bipolar transistors of like polarity having a fixed ratio of emitter areas; means for connecting the emitters of said first and second transistors to a common terminal;

first and second current sources for providing first and second predetermined currents to the collectors of said first and second transistors, respectively;

a third transistor having means for connecting its control terminal to said first current source and a first load terminal connected to the base of said first transistor for operating said first transistor to conduct said first predetermined current from said current source; means for interconnecting a second load terminal of said third transistor with a power supply terminal;

a resistor network including first and second resistors connected between the base of said first transistor and said common terminal for biasing the base of said second transistor to a fraction of the base emitter voltage of said first transistor;

a fourth transistor having means for connecting a first load terminal of said fourth transistor to said common terminal and means for connecting the control terminal of said fourth transistor to said second current source; the load current of said fourth transistor changing state when the preselected trip temperature has been reached.

5,589,793

VOLTAGE BOOSTER CIRCUIT OF THE CHARGE-PUMP TYPE WITH BOOTSTRAPPED OSCILLATOR

Christian G. Kassapian, Marseille, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Filed Sep. 29, 1993, Ser. No. 128,871

Claims priority, application France, Oct. 1, 1992, 92 11751

Int. Cl.[6] H03K *3/00*

U.S. Cl. 327—536 **23 Claims**

1. A charge pump comprising:

a stage of a voltage-boosting circuit comprising a transistor and a capacitor; and

a transistor switching control circuit coupled to the stage and controlling the switching of the transistor, the transistor switching control circuit comprising:

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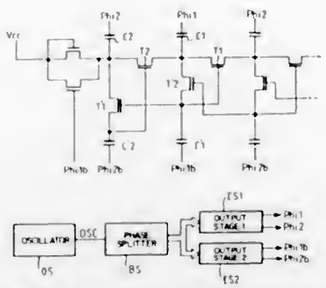


a ring oscillator generating an oscillator signal at an oscillator frequency;

a phase splitter stage receiving the oscillator signal and generating a plurality of non-overlapping phase-split signals substantially at the oscillator frequency;

a non-bootstrapped output stage, receiving the plurality of non-overlapping phase-split signals, and generating a plurality of non-bootstrapped non-overlapping output signals that switch between a zero voltage and a supply voltage substantially at the oscillator frequency; and

a bootstrapped output stage, receiving the plurality of non-overlapping phase-split signals, and generating a plurality of bootstrapped non-overlapping output signals that switch between the zero voltage and a voltage of greater magnitude than the supply voltage substantially synchronously with the non-bootstrapped non-overlapping output signals.

5,589,794

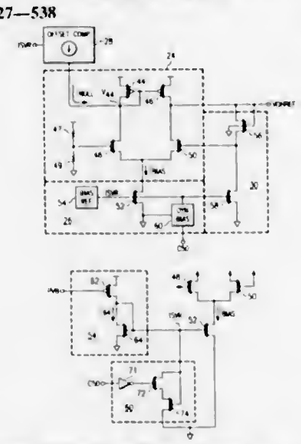
DYNAMICALLY CONTROLLED VOLTAGE REFERENCE CIRCUIT

David C. McClure, Denton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 20, 1994, Ser. No. 360,227

Int. Cl.[6] G05F *1/10*

U.S. Cl. 327—538 **19 Claims**



1. A voltage reference circuit, comprising:

a first reference transistor, having a source/drain path connected on a first end to a power supply voltage, and having a gate connected to a drain end of its source/drain path;

a second reference transistor having a source/drain path connected between a second end of the first reference transistor and a common node, and having a gate for receiving a bias voltage;

a first mirror transistor, having a source/drain path connected between the power supply voltage and an output node, and having a gate connected to the gate of the first reference transistor;

a second mirror transistor, having a source/drain path connected between the output node and the common node, and having a gate coupled to the output node; and

a switchable bias current source, coupled to the common node, for conducting a current including the sum of the currents in the second reference transistor and the second mirror transistor at a first level responsive to a select signal being at a first logic level, and at a second level lower than the first level responsive to the select signal being at a second logic level, wherein the select signal is a clock signal.

5,589,795

METHOD AND ARRANGEMENT FOR CONTROLLING A LOOP FILTER

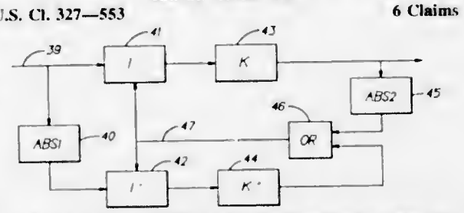
Matti Latva-Aho, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Dec. 19, 1994, Ser. No. 359,049

Claims priority, application Finland, Dec. 23, 1993, 935837

Int. Cl.[6] H03K *5/00*

U.S. Cl. 327—553 **6 Claims**



4. Apparatus for controlling a loop filter in a digital phase lock circuit, said phase lock circuit having a phase comparator, a loop filter, a clock, a local oscillator and a divider, said loop filter comprising:

a first integrator in the loop filter, said first integrator having an input coupled to an output of the phase comparator;

a first threshold detector coupled to an output of said first integrator, said first detector having an output coupled to the clock;

a second integrator;

a first means for providing an absolute value, said first means coupling an input of said second integrator to the output of the phase comparator;

a second threshold detector operatively coupled to an output of said second integrator; and

an OR gate having a first input connected to the output of said second threshold detector; and

a second means for providing an absolute value, said second means connecting a second input of said OR gate to the output of said first threshold detector, an output of said OR gate being connected to inputs of said first and second integrators for controlling said first and second integrators to reduce, when in a predetermined logic state, an output signal of said first and second integrators.

5,589,796

METHOD AND APPARATUS FOR INCREASING AMPLIFIER EFFICIENCY

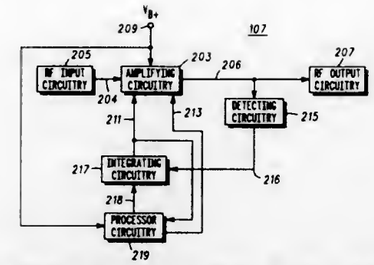
William P. Alberth, Jr., Crystal Lake; John J. Janssen, Round Lake Beach, and Armin Klomsdorf, Grayslake, all of Ill., assignors to Motorola, Inc, Schaumburg, Ill.

Filed Nov. 1, 1994, Ser. No. 332,968

Int. Cl.[6] H03G *3/30*

U.S. Cl. 330—133 **13 Claims**

13. A method of controlling amplifying circuitry of an RF communication device, the amplifying circuitry coupled to a power



source and having a first and a second input, an output, a saturation point, a gate bias responsive to a gate voltage signal, and amplifying an input signal into an amplified output signal having one of a plurality of power levels, the input signal coupled to the first input of the amplifying circuitry, the gate voltage signal coupled to the second input of the amplifying circuitry, the amplified output signal coupled to the output of the amplifying circuitry, the method of controlling the amplifying circuitry comprising the steps of:

(a) causing the amplifying circuitry to attenuate in a forward isolation mode;

(b) boosting the amplifying circuitry, when the RF communication device is outside of a range of normal communications, such that the amplified output signal has a power level greater than the plurality of power levels to maintain communication; and

(c) dynamically varying the gate voltage signal, when the RF communication device is functioning within the range of normal communications, for operating the amplifying circuitry as close to the saturation point as possible without preventing the amplifying circuitry from maintaining the amplified output signal at a preferred one of the plurality of power levels.

5,589,797

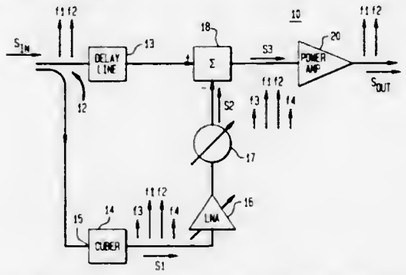
LOW DISTORTION AMPLIFIER

Michael J. Gans, Monmouth Beach, and Yu S. Yeh, Freehold, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 26, 1995, Ser. No. 534,371

Int. Cl.[6] H03F *1/26*

U.S. Cl. 330—149 **20 Claims**



1. A cuber circuit for converting a time varying input signal into an output signal having at least a third order distortion component, comprising:

an antiparallel diode arrangement including a first diode having a first cathode and a first anode, said first anode being coupled to a first circuit node, and a second diode having a second anode and a second cathode, said second cathode being coupled to said first circuit node;

a biasing circuit arrangement coupled to said antiparallel diode arrangement for causing D.C. bias current to flow through each of said diodes, said biasing circuit arrangement including a first source of D.C. potential between said first cathode and a second circuit node, and a second source of D.C. potential between said second anode and said second circuit node;

a load impedance coupled to said antiparallel diode arrangement for extracting signal current therefrom, said load impedance being coupled between said second circuit node and a third circuit node;

said input signal being applied between said first and third circuit nodes to produce said output signal having said third order distortion component across said load impedance.

5,589,798

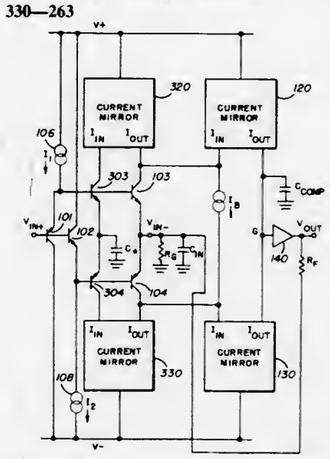
INPUT STAGE IMPROVEMENT FOR CURRENT FEEDBACK AMPLIFIERS

Barry Harvey, Los Altos, Calif., assignor to Elantec, Milpitas, Calif.

Continuation of Ser. No. 245,683, May 18, 1994, Pat. No. 5,418,495. This application May 19, 1995, Ser. No. 444,932

Int. Cl.[6] H03F *3/26;1/14*

U.S. Cl. 330—263 **3 Claims**



1. An input stage for a current feedback amplifier having a positive input terminal (V_{IN+}), a negative input terminal (V_{IN-}) with a parasitic capacitance (C_{IN}) and a gain node (G) connected to an output buffer, the input stage comprising:

a first pair of emitter follower transistors having bases coupled to the positive input (V_{IN+}), emitters coupled to the negative input (V_{IN-}) and collectors;

a capacitor (C*) having a first end connected to a reference potential and a second end;

a second pair of emitter follower transistors having bases coupled to the positive input (V_{IN+}), emitters coupled to the second end of the capacitor (C*) and collectors;

a first pair of current mirrors, each current mirror having an input connected to the collector of one transistor of the first pair of emitter follower transistors and an output connected to the gain node (G); and

a second pair of current mirrors, each current mirror having an input connected to the collector of one transistor of the second pair of emitter follower transistors and an output connected to the collector of one transistor of the first pair of emitter follower transistors.

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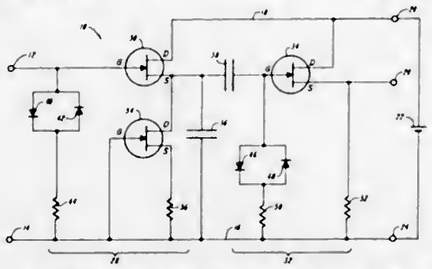
5,589,799

LOW NOISE AMPLIFIER FOR MICROPHONE

Peter L. Madaffari, Camden, and James S. Collins, Lincolnville, both of Me., assignors to Tibbetts Industries, Inc., Camden, Me.

Continuation of Ser. No. 314,694, Sep. 29, 1994, abandoned. This application May 23, 1995, Ser. No. 447,349
Int. Cl.[6] H03F *3/16*
U.S. Cl. 330—277 **12 Claims**



1. A preamplifier for a high impedance microphone comprising, in combination,

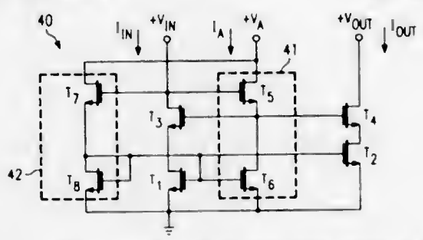
first and second stages each comprising a JFET connected in follower mode, each stage having a gate to ground input impedance, an output impedance connected from its source to ground independently of said input impedance and a drain connected to a power supply terminal, the source of the first stage JFET having a circuit connection to the gate of the second stage JFET, the size of the first stage JFET being less than half, and the size of the second stage JFET being more than twice, the size of a 2N4338 transistor considered as a standard for reference purposes.

5,589,800

DUAL VOLTAGE LEVEL SHIFTED, CASCODED CURRENT MIRROR

Kirk D. Peterson, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 313,526, Sep. 26, 1994, Pat. No. 5,515,010. This application Jun. 7, 1995, Ser. No. 481,907
Int. Cl.[6] H03F *3/16*
U.S. Cl. 330—288 **22 Claims**



1. A method for biasing a current mirror circuit having an input terminal; an output terminal; a common voltage terminal; first and second transistors having sources commonly connected to said common voltage terminal, gates commonly connected to each other, and drains; third and fourth transistors having sources respectively connected to said drains of said first and second transistors, gates, and drains respectively connected to said input and output terminals; said method comprising:

providing said third and fourth transistors with commonly connected gates;

providing a fifth transistor having a source connected to said commonly connected third and fourth transistor gates, a gate connected to said third transistor drain, and a drain;

flowing a current through said fifth transistor, for applying a forward biasing voltage at said commonly connected third and fourth transistor gates equal to an input voltage applied at said input terminal, shifted by a voltage differential between said fifth transistor gate and source; and

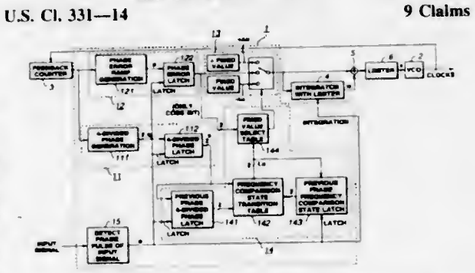
applying a forward biasing voltage at said commonly connected first and second transistor gates.

5,589,801

PHASE COMPARATOR CIRCUIT AND PHASE SYNCHRONIZATION CIRCUIT

Takaya Yamamura, and Kunihiro Esaki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1995, Ser. No. 558,789
Claims priority, application Japan, Nov. 21, 1994, 6-286278
Int. Cl.[6] H03L *7/085;7/093*
U.S. Cl. 331—14 **9 Claims**



1. A phase comparison circuit for use in generating clock pulses comprising:

detection means for detecting phase information present in an input signal;

error detection means for detecting a phase error with respect to the phase of the input signal;

switching means for switching between the phase error detected by the error detection means and a plurality of fixed values of phase error; and

control means for controlling switching of said switching means,

wherein said control means includes first storage means for storing past m portions of the phase information detected by said detection means, second storage means for storing past m portions of a frequency comparison state of the clock pulses, setting means for setting a current frequency comparison state from the phase information detected by said detection means, the phase information being stored in said first storage means and the frequency comparison state being stored in said second storage means, and selection means for selecting the phase error output by said switching means based upon the frequency comparison state as set by said setting means and a sign of the phase error detected by said error detection means.

5,589,802

CIRCUIT FOR DETECTING THE ABSENCE OF AN EXTERNAL COMPONENT

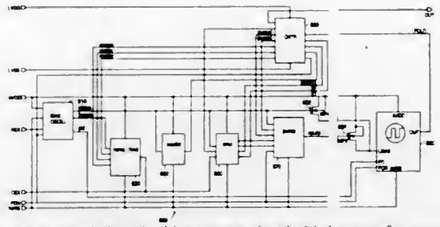
Timothy G. O'Shaughnessy, Blackforest, Colo., and David G. Brown, Pocatello, Id., assignors to American Microsystems, Inc., Pocatello, Id.

Filed Jun. 7, 1995, Ser. No. 479,302
Int. Cl.[6] G01R *27/14;27/26;* **H03K** *3/0231;* **H03B** *5/20*
U.S. Cl. 331—44 **30 Claims**

10. A resistor detecting circuit comprising:

a biasing circuit coupled to the resistor, the biasing circuit generating a bias current;

a bias current threshold detector coupled to the biasing circuit; and



means coupled to the bias current threshold detector for generating a signal indicative that the bias current is lower than threshold;

wherein the signal generating means comprises:

a NOR gate having a first input terminal coupled to a system clock timing signal generator and a second input terminal coupled to the bias current threshold detector.

5,589,803

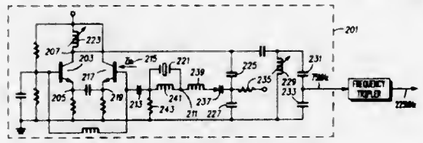
Patent Not Issued For This Number

5,589,804

OSCILLATOR WITH IMPEDANCE BUFFER FOR INCREASED PULLABILITY

Stanley Wrzesinski, Arlington Heights, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 17, 1995, Ser. No. 502,998
Int. Cl.[6] H03B *5/36;* **H03C** *3/20*
U.S. Cl. 331—116 R **10 Claims**



1. A pullable overtone oscillator comprising:

an amplifier having an input and an output wherein the output of the amplifier forms an output of the pullable overtone oscillator;

a tuned circuit having an input coupled to the output of the amplifier, and an output; and

an emitter follower having an input coupled to the output of the tuned circuit, and an output coupled to the input of the amplifier.

5,589,805

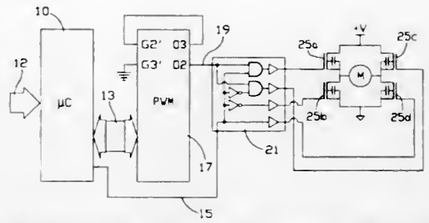
ENHANCED RESOLUTION PULSE WIDTH MODULATION CONTROL

Jeffery A. Zuraski, Saginaw, and Mark P. Colosky, Vassar, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 6, 1995, Ser. No. 554,173
Int. Cl.[6] H03K *7/08*
U.S. Cl. 332—109 **5 Claims**

1. A method of increasing the effective resolution of a pulse width modulated output in a pulse width modulated system including a plurality of discrete pulse width modulated output states, said method comprising the steps:

determining a desired output state to be effected during a predetermined control period;



determining a first pulse width modulated output state as one of the two of the plurality of discrete pulse width modulated output states which immediately flank said desired output state;

determining a second pulse width modulated output state as the other of the two of the plurality of discrete pulse width modulated output states which immediately flank said desired output state;

executing said first pulse width modulated state for a first total duration during said predetermined control period;

executing said second pulse width modulated state for a second total duration during said predetermined control period;

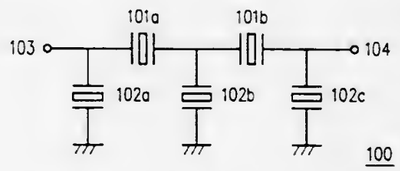
said predetermined control period comprising said first and second total durations.

5,589,806

SURFACE ACOUSTIC WAVE FILTER HAVING PARALLEL/SERIAL RESONATOR CONNECTION BASED ON TRANSMITTING AND RECEIVING FREQUENCIES

Yutaka Taguchi, Ibaraki; Kazuo Eda, Nara; Shun-ichi Seki, Osaka, and Keiji Onishi, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 5, 1995, Ser. No. 368,981
Claims priority, application Japan, Jan. 12, 1994, 6-001476
Int. Cl.[6] H03H *9/64*
U.S. Cl. 333—193 **6 Claims**



1. A surface acoustic wave filter to be used in a receiving circuit of a communication apparatus configured for simultaneously transmitting a first signal having a predetermined transmitting frequency and receiving a second signal having a predetermined receiving frequency which is lower than the transmitting frequency, the surface acoustic wave filter comprising:

an input terminal for receiving an input signal;

an output terminal for providing an output signal; and

a plurality of surface acoustic wave resonators,

wherein the plurality of surface acoustic wave resonators include: at least one series surface acoustic wave resonator connected in series to a signal line connecting the input terminal and the output terminal; and at least two parallel surface acoustic wave resonators each connected between a ground and respective predetermined positions in the signal line, and

wherein one of the at least two parallel surface acoustic wave resonators is disposed most closely to the input terminal among the plurality of surface acoustic wave resonators.

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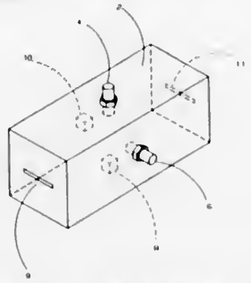
5,589,807

MULTI-MODE TEMPERATURE COMPENSATED FILTERS AND A METHOD OF CONSTRUCTING AND COMPENSATING THEREFOR

Wai-Cheung Tang, Ontario, Canada, assignor to COM Dev. Ltd., Cambridge, Canada

Filed Jun. 7, 1995, Ser. No. 475,656
Claims priority, application Canada, Jul. 7, 1994, 2127609
Int. Cl.[6] H01P *1/208;7/06*
U.S. Cl. 333—212 **48 Claims**



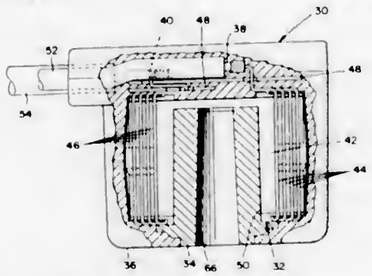
1. A microwave filter comprising an input and output and a first cavity made of a material having a coefficient of thermal expansion and resonating at an operating frequency in at least two orthogonal modes substantially simultaneously, said cavity having a volume that is changeable with temperature, said cavity containing solid dielectric material having a dielectric constant that varies with temperature, said dielectric material being sized so that it does not resonate at the operating frequency of the cavity, there being at least one amount of said dielectric material having a value of a temperature coefficient of the dielectric constant to compensate for changes in the volume of the cavity with temperature to at least reduce a variation in said operating frequency that would otherwise by caused by a temperature-induced volume change of said cavity.

5,589,808

ENCAPSULATED TRANSFORMER

William A. Clark; Carl C. Strickland, Jr., both of Kinston, and Mark C. Newman, LaGrange, all of N.C., assignors to Cooper Industries, Inc., Houston, Tex.

Division of Ser. No. 104,484, Jul. 28, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 289,534
Int. Cl.[6] H01F *27/02;27/30*
U.S. Cl. 336—92 **10 Claims**



1. An encapsulated transformer, comprising:

a transformer coil assembly that includes a core having a hollow interior, primary wire windings and secondary wire windings;

at least one primary lead connected to the primary windings;

at least one secondary lead connected to the secondary windings;

a rigid core insert having an upstanding portion positioned within the hollow interior of the core and a base portion on which the transformer coil assembly rests, said core insert having a hole which extends through the base portion and into the upstanding portion wherein the base portion of said core insert has an end face which faces away from said upstanding portion, said end face having at least one groove formed therein that extends from the hole in the core insert to an outer edge of the end face to communicate the hole in the core insert with the outer edge of the end face;

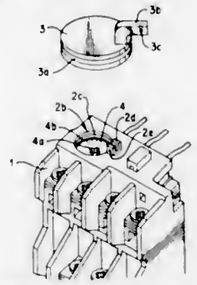
a unitary thermoplastic rubber jacket surrounding the transformer coil assembly and bonded to the base portion of the core insert to provide a completely waterproof encapsulated transformer.

5,589,809

THERMAL OVERLOAD RELAY WITH MIS-READJUSTMENT PREVENTING DEVICE

Kuniyuki Kogawa, and Koetsu Takaya, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 7, 1995, Ser. No. 399,990
Claims priority, application Japan, Mar. 15, 1994, 6-043472
Int. Cl.[6] H01H *61/00*
U.S. Cl. 337—36 **9 Claims**



1. A thermal overload relay comprising:

a case for retaining a relay, said case having an insertion hole and first coupling means formed around the insertion hole;

means for adjusting a working current of the relay situated inside the insertion hole; and

a cover for covering said adjusting means situated in the insertion hole, said cover being formed of a transparent plate and including a side surface, a smooth upper surface, second coupling means formed on the side surface and engageable with the first coupling means, and a handle formed on the upper surface of the cover for handling the cover and being shaped and made of a material cuttable along the upper surface thereof, said cover, when disposed in the insertion hole to engage the first and second coupling means, being positioned such that the upper surface of the cover is located below an upper surface of the case and the handle projects outwardly from the upper surface of the case.

5,589,810

SEMICONDUCTOR PRESSURE SENSOR AND RELATED METHODOLOGY WITH POLYSILICON DIAPHRAGM AND SINGLE-CRYSTAL GAGE ELEMENTS

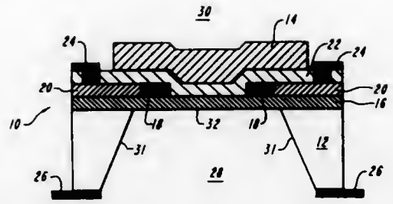
Clifford D. Fung, Mansfield, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation-in-part of Ser. No. 38,664, Mar. 26, 1993, Pat. No. 5,357,808, which is a division of Ser. No. 676,914, Mar. 28, 1991, Pat. No. 5,220,838. This application Mar. 18, 1994, Ser. No. 210,422
Int. Cl.[6] G01L *1/22*
U.S. Cl. 338—4 **9 Claims**

1. Semiconductor pressure sensor apparatus comprising

A. a polysilicon diaphragm having opposed first and second surfaces,

B. an etched silicon substrate supporting said diaphragm at said first surface for deflection of said diaphragm in response to a pressure difference between said first and second surfaces,



C. first means forming single-crystal silicon piezoresistive sensing means mounted with said first surface of said diaphragm for sensing deflection of said diaphragm,

D. dielectric isolation means of silicon oxide disposed for dielectrically isolating said sensing means, and

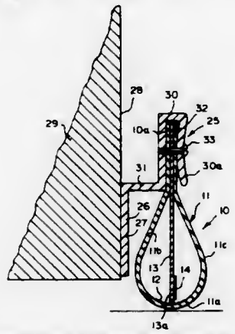
E. first interconnection means in circuit with said sensing means for external electrical connection to said pressure sensor.

5,589,811

POWER DOOR SAFETY SENSING STRIP

Robert Pariot, New Windsor, N.Y., and J. Mortimer Traugott, Riverton, N.J., assignors to Techstrip, Inc., Oaklyn, N.J.

Filed Jun. 22, 1995, Ser. No. 493,624
Int. Cl.[6] H01C *3/00*
U.S. Cl. 338—210 **8 Claims**



1. A door safety sensing strip for attachment to a power door for sensing an object obstructing closure of the door comprising a flexible insulating elongated tubular member having a bell-like shaped cross section, the tubular member being formed by an arcuate deformable portion connected by flexible sidewalls to a narrow section, a wide inner face on the arcuate portion facing the narrow section, a first flexible conductive surface on the wide inner face, a flat flexible insulating member fastened to and extending from the narrow section of the tubular member into contact with and substantially perpendicular to the conductive inner surface, second flexible conductive surfaces on opposite sides of the flat insulating member located near the first conductive inner surface of the tubular member, whereby deformation of the tubular member will result in electrical contact between the first conductive inner surface of the tubular member and at least one of the second conductive surfaces on the flat insulating member due to bending of the flat insulating member causing said at least one second conductive surface to rotate toward a parallel relationship with and engage the first conductive surface to form an electrical contact.

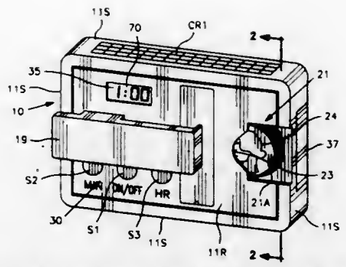
5,589,812

PERSONAL METER TIMING DEVICE

Rickey A. Jones, 1248 W. 127th St., Los Angeles, Calif. 90044

Filed Jan. 6, 1995, Ser. No. 369,714
Int. Cl.[6] G08B *1/00;* **G07F** *7/00*
U.S. Cl. 340—309.15 **5 Claims**

1. A portable parking meter timing device comprising:



an electrical circuit having a plurality of electrical components including a power source, a timing duration programming means, a timing means, a time set and remaining display means, an audible warning means, and a power switch, the components interconnected to enable programming of a selected timing duration, timing said timing duration, and providing an audible warning signal when said timing duration is completed;

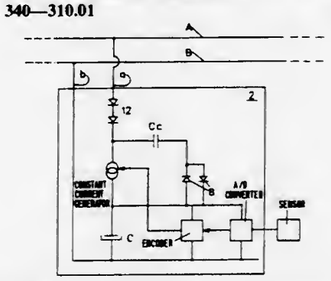
a case providing a from and a rear opposing walls and a plurality of side walls interconnecting the front and rear walls and providing rigidity to the case and fully enclosing an interior space within the walls for holding the electrical circuit, an aperture in the rear wall for accepting coins for storage therein, the rear wall further providing, mounted pivotally thereon, a clip capable of attaching the case to a support element, and a window enabling observation of the display means, and an actuation means enabling the setting of a timing duration into the timing duration programming means, the silencing of the audible alarm means, and the turning of the timing device off and on.

5,589,813

DATA COMMUNICATION SYSTEM OF THE FIELD BUS TYPE WITH A TWIN LEAD FOR POWER SUPPLY TO CONNECT UNITS AND FOR DATA TRANSMISSION BETWEEN THE UNITS

Ole C. Nielsen, Asger Jorns Vej 18, DK-8600 Silkeborg, Denmark

PCT No. PCT/DK92/00302, § 371 Date Apr. 13, 1994, § 102(e) Date Apr. 13, 1994, PCT Pub. No. WO93/08652, PCT Pub. Date Apr. 29, 1993
PCT Filed Oct. 14, 1992, Ser. No. 211,703
Claims priority, application Denmark, Oct. 14, 1991, 1732/91
Int. Cl.[6] H04M *11/04*
U.S. Cl. 340—310.01 **6 Claims**



1. A field bus data communication system comprising:

a twin lead cable;

a plurality of electronic units connected to the twin lead cable, each electronic unit including a current pulse generator which generates current pulse trains modulating current flow on the twin lead cable to produce current flow between the electronic units on the twin lead cable; and wherein

each electronic unit is contained in a conductive housing having at least one capacitor coupled between the conductive housing

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and the electronic unit which equalizes capacitance between the conductive housing and respective terminals of the electronic unit and has a dynamic clamp circuit coupled to the twin lead cable for limiting alternating current voltage variations on the twin lead cable to be below a maximum value to minimize reflections on the twin lead cable and has a pair of diodes coupled in an anti-parallel configuration to each other with the anti-parallel configuration having terminals electrically coupled between the twin lead cable.

5,589,814

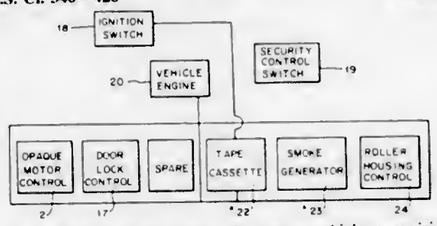
ANTI-THEFT VEHICLE SECURITY SYSTEM

John Smith, Jr., 2635 Sawmill Rd., N. Bellmore, N.Y. 11710

Filed Nov. 14, 1994, Ser. No. 369,217

Int. Cl.[6] B60K *25/10*

U.S. Cl. 340—426 **9 Claims**



1. An anti-theft security system for a motor vehicle, comprising:

a double pane front windshield in a motor vehicle comprising two spaced-apart window panes defining a chamber therebetween, said chamber having a top end and a bottom end;

an extensible and retractable opaque curtain positioned within said chamber for movement between a retracted position in which said curtain is retracted to allow an uninhibited driving view through said front windshield and an extended position in which said curtain extends from the top to the bottom of said chamber to block the driving view through said front windshield, said curtain being configured and dimensioned to generally span said chamber from said top end to said bottom end of said chamber and across the width of the same when in said extended position thereof;

a control switch having an on position and an off position for arming and disarming said system;

means for automatically moving said curtain from said retracted position to said extended position; and

a trigger mechanism for activating said means for automatically moving said curtain upon activation of the trigger mechanism when said control switch is in an on position.

5,589,815

SYSTEM FOR DETERMINING PNEUMATIC TIRE PRESSURE FOR MOTOR VEHICLE

Takashi Nishihara; Toru Ikeda; Osamu Yano, and Shuji Shiraishi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,941

Claims priority, application Japan, Nov. 2, 1993, 5-274521

Int. Cl.[6] B60C *23/00*

U.S. Cl. 340—444 **3 Claims**

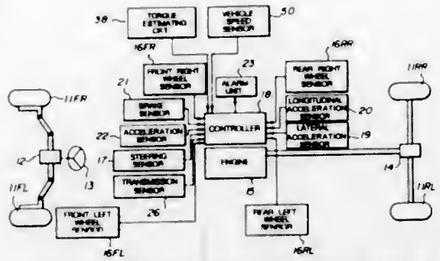
1. A system for determining a pneumatic tire pressure of road wheels on a motor vehicle, comprising:

first differential speed means for detecting a front rotational speed difference between rotational speeds of front left and right road wheels of the motor vehicle;

second differential speed means for detecting a rear rotational speed difference between rotational speeds of rear left and right road wheels of the motor vehicle;

running condition detecting means for detecting a running condition of the motor vehicle;

reference differential speed calculating means for calculating a reference rotational speed difference between rotational



speeds of the front left and right road wheels based on an output signal from said running condition detecting means;

first pressure reduction determining means for comparing said front rotational speed difference and said rear rotational speed difference to determine a pneumatic tire pressure reduction of said front left and right road wheels or said rear left and right road wheels;

second pressure reduction determining means for comparing said front rotational speed difference or said rear rotational speed difference and said reference rotational speed difference to determine a pneumatic tire pressure reduction of one of said front left and right road wheels or said rear left and right road wheels; and

final pressure reduction determining means for determining a pneumatic tire pressure reduction from output signals from said first pressure reduction determining means and said second pressure reduction determining means based on at least a combination of a first ratio in said first pressure reduction determining means and a second ratio in said second pressure reduction determining means corresponding to one of; (a) at least a steering angle, (b) at least a yaw rate, and (c) at least a lateral acceleration of said motor vehicle.

5,589,816

METHOD AND DEVICE FOR DETECTING A DEFLATED TIRE ON A VEHICLE

David Jones, Lichfield, England, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

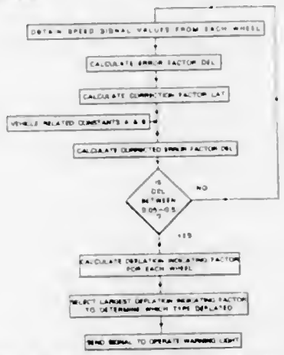
PCT No. PCT/JP94/00501, § 371 Date Nov. 16, 1994, § 102(e) Date Nov. 16, 1994, PCT Pub. No. WO94/22681, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 29, 1994, Ser. No. 335,822

Claims priority, application United Kingdom, Apr. 1, 1993, 9306846.8

Int. Cl.[6] B60C *23/00*

U.S. Cl. 340—444 **25 Claims**



1. A method of detecting a deflated tire on a vehicle comprising the steps of:

comparing the rolling radii of the tires by comparing angular velocity signals from wheel speed sensors one at each wheel;

calculating an error value (DEL') where

$$DEL' = \frac{|(C1 = C4)/2 - (C2 + C3)/2| \times 100}{(C1 + C2 + C3 + C4)/4}$$

where C1, C2, C3 and C4 are angular velocity values for left-hand front, right-hand front, left-hand rear and right-hand rear wheels of the vehicle respectively;

determining a correction factor;

calculating a corrected error signal (DEL) where

$$DEL = DEL' - DELCOR$$

wherein

$$DELCOR = (LAT \times A) + (B \times LAT^2)$$

wherein

A and B are vehicle related constants;

outputting a warning signal when a magnitude of the corrected error signal is between 0.05 and 0.5; and

operating a tire warning indicator indicating that at least one tire is deflated when said warning signal is output.

5,589,817

EARLY WARNING BRAKE LIGHT SYSTEM

Geoffrey M. Furness, 14 Fordyce Avenue, Auckland, New Zealand

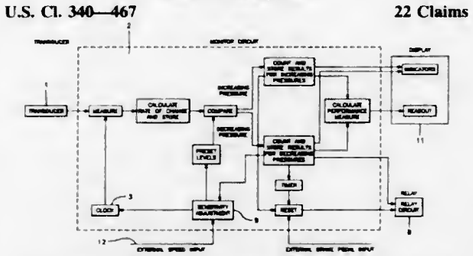
PCT No. PCT/NZ93/00110, § 371 Date Jul. 12, 1995, § 102(e) Date Jul. 12, 1995, PCT Pub. No. WO94/11221, PCT Pub. Date May 26, 1994

PCT Filed Nov. 11, 1993, Ser. No. 428,205

Claims priority, application New Zealand, Nov. 18, 1992, 245165

Int. Cl.[6] B60Q *1/50*

U.S. Cl. 340—467 **22 Claims**



17. A method of operating a warning signal indicative or reasonably indicative of a vehicle about to be braked or severely decelerated, said method comprising:

(i) generating with a piezoelectric transducer an electrical signal indicative of a rate of change in the pressure or force (hereafter "foot pressure signal") being applied to the accelerator of the vehicle;

(ii) optionally generating an electrical signal indicative of the speed of the vehicle (hereafter "speed signal");

(iii) (a) comparing, in a monitoring circuit receiving said foot pressure signal, negative values (ie. those of a rate of decrease of pressure) of said foot pressure signal against a threshold level to provide a determination of whether or not there is likely to be a panic stop or not;

(b) optionally comparing in a monitoring circuit receiving said speed signal, values of said speed signal to determine whether said vehicle is travelling in excess of a speed threshold;

(iv) if the comparison is step (iii) provides a determination of there being a likely panic stop providing at least for a brief period of time an electrical current actuation of said warning signal.

5,589,818

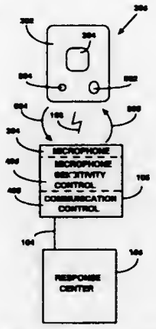
PERSONAL RESPONSE SYSTEM WITH REMOTELY ADJUSTABLE MICROPHONE SENSITIVITY

Andrew Queen, 4744 S. Ocean Blvd., Highland Beach, Fla. 33487

Filed Aug. 27, 1993, Ser. No. 113,274

Int. Cl.[6] G08B *29/00;1/00;23/00;* **H04M** *11/04*

U.S. Cl. 340—506 **16 Claims**



1. A personal response system with emergency audio mode, comprising:

a response center for monitoring a plurality of help consoles for emergency status conditions, the response center further having means to transmit microphone sensitivity commands; at least one help console for use in a user's premises, further comprising:

a microphone sensitivity control;

a communications control to communicate with the response center, the communications control capable of receiving microphone sensitivity commands from the response center which define gradual changes in microphone sensitivity and further having means to control the microphone sensitivity control;

the microphone sensitivity control is controlled by the communications control and has an output for adjusting microphone sensitivity levels;

a microphone means to input and transmit audio signals from the help console to the response center, the sensitivity of the microphone means controlled by the microphone sensitivity control such that a single microphone in the microphone means can have its sensitivity adjusted to extend from the immediate area of the microphone to several rooms within the user's premises; and

a speaker to output audio signals received from the response center;

whereby the response center can gradually adjust the microphone sensitivity of the help console such that the physical listening range of a single microphone in the help console can be gradually increased from the immediate area of the help console to several rooms within the user's premises.

5,589,819

SELF-SOUNDING TAG ALARM

Harumi Takeda, Osakasayama, Japan, assignor to Takeda Technological Research Co., Ltd., Osaka, Japan

Filed Aug. 18, 1994, Ser. No. 292,750

Claims priority, application Japan, Aug. 23, 1993, 5-230935

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—571 **6 Claims**

1. A self-sounding tag alarm apparatus for use on a commodity to prevent shoplifting, said apparatus comprising:

a main housing;

coupling means for detachably attaching the main housing to the commodity;

alarm generating means mounted in said main housing for generating an alarm;

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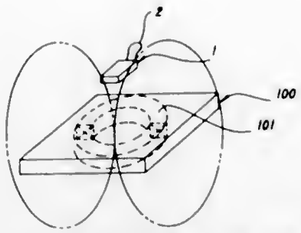


detecting means for detecting at least one of a signal of a particular frequency produced externally of said main housing and removal of said coupling means;

reset signal input means on said main housing for having a reset signal applied thereto, said reset signal being provided externally of said main housing, said reset signal input means including a resonator circuit for detecting an electromagnetic wave of a predetermined frequency, said electromagnetic wave of a predetermined frequency being different from the signal of a particular frequency produced externally of said main housing, and a comparator, said comparator being enabled when an output of said resonator circuit exceeds a predetermined level; and

reset signal generating means for generating the electromagnetic wave of a predetermined frequency, said electromagnetic wave of a predetermined frequency being a reset signal, said reset signal generating means including an oscillator coil disposed in a flat housing.

5,589,820

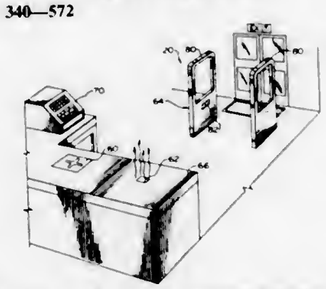
RETAIL THEFT PREVENTION AND INFORMATION DEVICE

Donald G. Robinson; Michael W. Geatz, both of Fargo, N. Dak., and Michael J. Corcoran, Bend, Oreg., assignors to PAC/SCAN, Inc., Bismarck, N. Dak.

Continuation of Ser. No. 131,663, Oct. 5, 1993, abandoned. This application Oct. 11, 1995, Ser. No. 540,901

Int. Cl.[6] G08B *13/18*

U.S. Cl. 340—572 **18 Claims**



1. A device adapted to be associated with a product for preventing theft of the product and for emitting a code identifying the product, the device comprising:

frequency activation means for receiving a frequency signal generated by an external source and for generating an activation signal;

a piezoelectric device for receiving the activation signal;

power means for supplying power only after the activation signal is received;

memory means for storing the code, the memory means being coupled to the power means to output the code when power is supplied to the memory means;

switch means with normally open contacts coupled between the memory means and the power means, the switch means being operable in response to the piezoelectric device to couple the power means to the memory means upon the piezoelectric device receiving the activation signal initiated by the frequency activation means; and

transmitter means for transmitting the code received from the memory means.

5,589,821

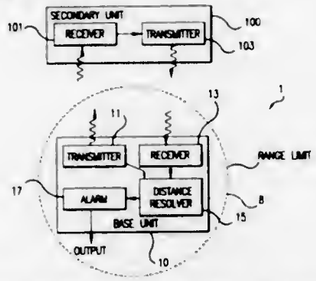
DISTANCE DETERMINATION AND ALARM SYSTEM

Roy Sallen, Wayland; W. James Budzyna, Whitinsville, and Charles E. Sawabini, Carlisle, all of Mass., assignors to Secure Technologies, Inc., Boston, Mass.

Filed Dec. 13, 1994, Ser. No. 355,041

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—573 **4 Claims**



1. A system, of the type having a plurality of transceiver units for generating an alarm when a child transceiver unit is more than a predetermined distance away from a parent transceiver unit, the system comprising:

(a) a portable parent unit;

(b) a first transmitter portion, disposed in the parent unit, the first transmitter portion having:

(i) a first rf transmitter, operative at a first carrier frequency, having an output;

(ii) a signal generator for generating a first reference signal;

(iii) a first FM modulator, coupled to the first rf transmitter, for modulating the first carrier with the first reference signal;

(iv) a first digital encoder for digitally encoding the FM-modulated carrier with a digital signature to identify the output of the first transmitter;

(c) a portable child unit of a size permitting it to be worn by a human subject, the child unit having:

(i) a second receiver, tuned to the first carrier frequency, for receiving a signal broadcast from the output of the first transmitter;

(ii) a digital decoder for decoding the digital signature from the signal received by the second receiver and providing a decoded output;

(iii) an inhibitor arrangement, coupled to the digital decoder, for preventing transmission by the child unit unless the decoded output meets criteria stored in the child unit;

(iv) a second rf transmitter, operative at a second carrier frequency, and having an output; and

(v) a second FM modulator, coupled to the second rf transmitter and to the second receiver, for modulating the second carrier with a second reference signal having a prespecified phase relationship to the first reference signal as received by the second receiver;

(d) a first receiver portion, disposed in the parent unit, the first receiver portion having:

(i) a first receiver, tuned to the second carrier frequency, for providing an output of the demodulated second reference signal;

(ii) a distance resolver, coupled to the first receiver and the signal generator, for providing an output signal dependent on the phase relationship, between the first reference signal and the demodulated second reference signal, that is indicative of the distance between the child unit and the parent unit; and

(iii) an alarm, coupled to the distance resolver, triggered if the output signal from the distance resolver, exceeds a specified maximum distance.

5,589,822

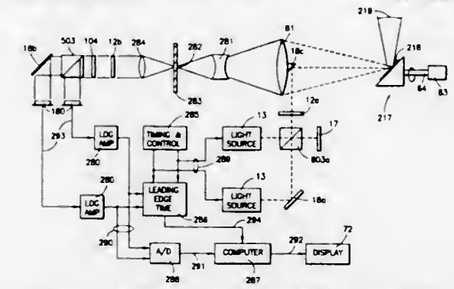
SYSTEM FOR DETECTING ICE OR SNOW ON SURFACE WHICH SPECULARLY REFLECTS LIGHT

Howard Stern, Greenlawn, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 963,840, Oct. 20, 1992, Pat. No. 5,475,370. This application Dec. 16, 1994, Ser. No. 357,875

Int. Cl.[6] G08B *19/02*

U.S. Cl. 340—583 **26 Claims**



1. A method for detecting on a surface which specularly reflects light, a presence of a polarization altering substance comprising the steps of:

transmitting light over a transmitting path to said surface;

receiving said transmitted light over a receiving path for said transmitted light from said surface and from said substance alternately in optical isolator and optical nonisolator states;

measuring a first intensity of light received in said optical non-isolator state;

measuring a second intensity of light received in said optical isolator state; and

comparing said first and second intensities of received light to a plurality of reference data to detect the presence of said substance on said surface.

5,589,823

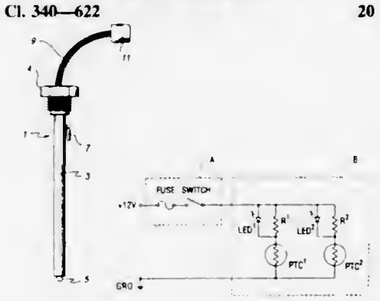
REMOTE STATUS INDICATOR FOR HOLDING TANKS CONTAINING NO MOVING PARTS

Robert Lange, 18652 Midway, Allen Park, Mich. 48101

Filed Dec. 29, 1994, Ser. No. 365,702

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—622 **20 Claims**



1. A transistor and integrated circuit-free device for remotely indicating the fill status of a liquid-containing holding tank on a recreational vehicle or pleasure boat having a direct current voltage supply, comprising:

(a) at least one sensing element comprising a support adapted to be inserted in a holding tank;

(b) a plurality n of sensor elements fixedly mounted to said sensing element, said sensor elements positioned at different heights relative to said liquid contained in said tank, the height of each of said sensor elements corresponding to a level of liquid whose status is to be monitored, each of said sensor elements comprising a positive temperature coefficient resistor characterized by a resistance/temperature curve exhibiting relatively low resistance below a given temperature, and a steeply rising resistance above said given temperature;

(c) a parallel electrical circuit having n branches, said parallel electrical circuit biased by said direct current voltage supply, each of said branches comprising at least one of said sensor elements and a current limiting resistor associated therewith;

(d) a plurality of light emitting diodes having a non-emitting off-state and an emitting on-state, mounted remotely from said sensor elements, each of said light emitting diodes associated with a branch of said parallel circuit such that the on/off-state of said light emitting diode changes in response to said liquid level passing the position of the sensor element which forms a part of the same parallel circuit branch with which said light emitting diode is associated.

5,589,824

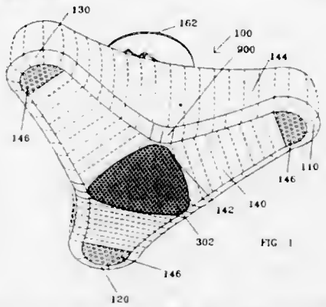
MULTI-SENSOR DETECTION SYSTEM

Adam Q. Lynch, 75 N. Lakeside Dr., Madison, Ind. 47250

Filed Nov. 9, 1995, Ser. No. 556,201

Int. Cl.[6] G08B *17/10*

U.S. Cl. 340—628 **17 Claims**



1. An alarm for sensing a plurality of conditions of an ambient air comprising:

a housing, said housing having a generally triangular configuration and including:

first, second and third lobes at corners of said housing;

perforations in a lower surface of said housing and at said lobes for passage of the ambient air therethrough;

a perforated central portion in said lower surface of said housing for passage of sound therethrough;

an alarm circuit in said housing comprising:

a power source for said circuit;

an alarm adjacent said central portion of said housing;

an air sensor in each respective lobe, each sensor causing a particular current flow to sound said alarm upon sensing a predetermined condition of the ambient air, the alarm sound passing through said central portion.

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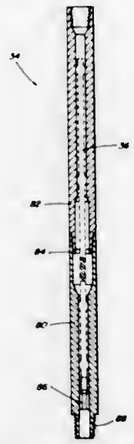
5,589,825

LOGGING OR MEASUREMENT WHILE TRIPPING

Daniel G. Pomerleau, Calgary, Canada, assignor to LWT Instruments Inc., Alberta, Canada

Filed Sep. 22, 1994, Ser. No. 310,840
Claims priority, application Canada, Jul. 6, 1994, 2127476
Int. Cl.[6] G01V *3/00*
U.S. Cl. 340—854.9 **34 Claims**



1. A drilling sub for receiving a logging tool through a drillstring, the logging tool having sensing and monitoring means for collecting and storing data from within a drillstring, the drilling sub comprising:

a drilling sub body engageable with the drillstring;

coupling means within the drilling sub body for engaging the logging tool within the drilling sub body; and

hydraulically actuated window means on the drilling sub body responsive to the engagement of the logging tool within the drilling sub body, the window means to enable the sensing and monitoring means access to the well bore.

5,589,826

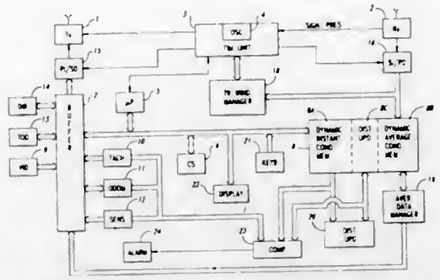
Patent Not Issued For This Number

5,589,827

INTERACTIVE METHOD FOR MONITORING ROAD TRAFFIC, AND ITS ONBOARD APPARATUS, AND SYSTEM FOR IMPLEMENTING THE METHOD

Mario Scurati, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Apr. 26, 1994, Ser. No. 233,120
Claims priority, application European Pat. Off., May 11, 1993, 93830197
Int. Cl.[6] G08B *1/00*
U.S. Cl. 340—901 **22 Claims**



1. An interactive method for monitoring road traffic, comprising the steps of:

detecting, through a receiver and a processor installed on a vehicle, said processor being coupled to said receiver, the presence of vehicles traveling ahead in the same running direction and their dynamic conditions; as transmitted in the form of a coded message from each of said preceding vehicles, at defined transmission time windows that are different for each vehicle, within a transmission period comprising a plurality of time windows,

detecting through said receiver and said processor, said transmission time windows and their position within said transmission period and

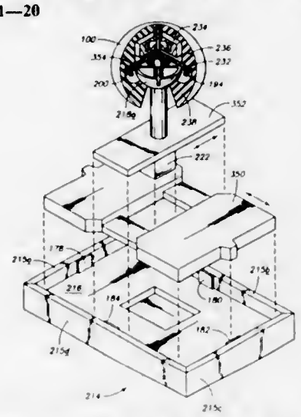
transmitting, through a transmitter installed on the vehicle, and capable of recognizing received messages, a coded message indicating at least the presence of said vehicle and dynamic conditions thereof to following vehicles, traveling in the same running direction, at separate time windows from said detected transmission time windows of the preceding vehicles whose presence has been detected.

5,589,828

6 DEGREES OF FREEDOM CONTROLLER WITH CAPABILITY OF TACTILE FEEDBACK

Brad A. Armstrong, 6630 Arabian Cir., Roseville, Calif. 95661

Filed Mar. 5, 1992, Ser. No. 847,619
Int. Cl.[6] G05G *9/00*
U.S. Cl. 341—20 **18 Claims**



14. A hand-operated controller allowing six bi-directional degrees of freedom of hand input force into a single handle, said controller comprising:

said single handle movably supported by

means for converting hand input force applied in any direction to said single handle into movement of said single handle in a direction substantially identical to the hand input force direction and relative to

a stationary support base of said controller; whereby linear hand input force against said single handle absent rotational force can move said single handle purely linearly, and rotational hand input force against said single handle absent linear force can move said single handle purely rotationally;

linear sensor means for sensing only linear movement of said single handle and producing electrical output signals indicative of linear hand input force direction against said single handle;

rotational sensor means for sensing only rotational movement of said single handle and producing electrical output signals indicative of rotational hand input force direction against said single handle.

15. An improved hand operated controller of the type allowing six degrees of bi-directional freedom of hand inputs for conversion of the hand inputs into electrical outputs;

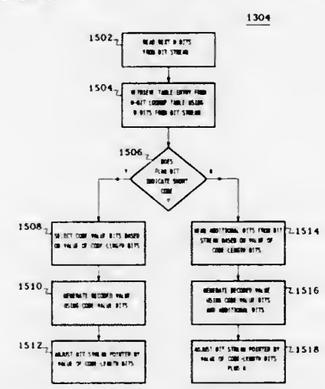
wherein the improvement comprises the use of a separate and distinct sensor for each direction of each bi-directional degree of freedom of said six degrees of freedom; whereby twelve separate and distinct sensors are utilized for converting hand inputs into said electrical outputs.

5,589,829

DECODING VARIABLE-LENGTH ENCODED SIGNALS

Brian Astle, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 26, 1994, Ser. No. 329,340
Int. Cl.[6] H03M *7/40*
U.S. Cl. 341—67 **16 Claims**



1. A computer-implemented process for transforming a variable-length encoded signal into a decoded signal, wherein the variable-length encoded signal comprises up to M bits, comprising the steps of:

(a) reading N bits from a bit stream comprising the variable-length encoded signal, wherein N is less than M;

(b) accessing an N-bit lookup table using the N bits from the bit stream as an index to retrieve a table entry, wherein the table entry comprises:

a flag bit indicating whether the variable-length encoded signal is a short code signal or a long code signal;

one or more code-length bits; and

one or more code-value bits;

(c) if the flag bit indicates that the variable-length encoded signal is a short code signal, then generating the decoded signal using the code-value bits, wherein the code-length bits indicate the length of the variable-length encoded signal; and

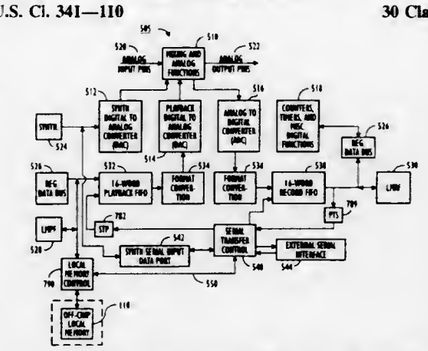
(d) if the flag bit indicates that the variable-length encoded signal is a long code signal, then generating the decoded signal using the code-value bits and one or more additional bits from the bit stream, wherein the code-length bits indicate the number of additional bits to be read from the bit stream to complete the variable-length encoded signal.

5,589,830

STEREO AUDIO CODEC

Alfredo R. Linz; Carlin D. Cabler; Glen W. Brown, and Martio P. Soques, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 2, 1994, Ser. No. 333,467
Int. Cl.[6] H03M *1/00*
U.S. Cl. 341—110 **30 Claims**



1. A stereo audio coder-decoder (CODEC) circuit, comprising:

(a) an analog mixer circuit having a plurality of inputs and outputs;

(b) a digital-to-analog conversion circuit, having at least one input and one output, and having a multi-stage interpolation filter circuit, a noise shaper circuit and a semi-digital FIR filter circuit, whereby said at least one output is connected to an input of said analog mixer circuit;

(c) an analog-to-digital conversion circuit, having at least one input and one output, and having a fourth order sigma-delta modulator circuit, a multi-stage digital decimation filter circuit and a digital compensation circuit, whereby said at least one input is connected to an output of said analog mixer circuit;

(d) data format conversion circuitry connected to said at least one input of said digital-to-analog conversion circuit and to said at least one output of said analog-to-digital conversion circuit;

(e) on-chip memory, for storing digital audio signals, whereby said data format conversion circuitry is connected to said on-chip memory and provides data compression/decompression operations on data being input or output to or from said on-chip memory; and

wherein said digital-to-analog and said analog-to-digital conversion circuits are capable of operating at independently programmable sample rates.

5,589,831

FULLY DIFFERENTIAL FLASH ADC BASED ON THE VOLTAGE FOLLOWER AMPLIFIER STRUCTURE

Derek L. Knee, Sunnyvale, Calif., assignor to Samsung Semiconductor, Inc., San Jose, Calif.

Filed Jan. 30, 1995, Ser. No. 380,778
Int. Cl.[6] H03M *1/36*
U.S. Cl. 341—159 **4 Claims**

1. An analog to digital convertor comprising:

an input follower differential input stage, having first and second inputs coupled to receive a differential input signal and having first and second outputs for providing a differential output signal;

first and second current sources for providing a constant reference current;

a differential resistive ladder (DRL) having first and second legs with each leg having a series of (N+2) nodes, where N is a predetermined integer, starting with an input node and ending with an output node with the input node of the first and second legs coupled to the first and second outputs, respec-

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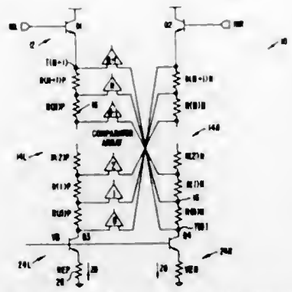


tively, of the differential input stage and the output nodes of the first and second legs coupled, respectively, to the first and second current sources, said DRL for providing a voltage difference between adjacent nodes determined by the differential output signal and the constant reference current; and

a comparator array comprising (N+2) comparators, with the nth comparator, n=0, 1, . . . , N, N+1, having a first input coupled to a node of the first leg displaced from the output node of the first leg by n nodes and a second input coupled to a node in the second leg displaced from the input node of the second leg by n nodes.

5,589,832

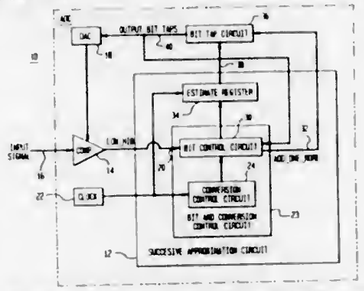
LOW NOISE NON-SAMPLED SUCCESSIVE APPROXIMATION

Jeffrey P. Grundvig, and David G. Vallancourt, both of Macungie, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 2, 1994, Ser. No. 349,153

Int. Cl.[6] H03M *1/38*

U.S. Cl. 341—161 **20 Claims**



1. A successive approximation circuit for digitally approximating a moving signal forming an analog-digital converter (ADC) receiving a comparison signal to the successive approximation circuit, the successive approximation circuit comprising:

a conversion control circuit including a decoder for generating a plurality of decoder counts as a control signal;

an estimate register for holding a current plurality of output bits; and

a bit control circuit for generating a next plurality of output bits as a next input to the estimate register in response to the control signal to generate the next plurality of output bits and to generate, from the plurality of decoder counts, a control value associated with a current decoder value and a least significant bit (LSB), the bit control circuit responsive to the comparison signal for adjusting the current plurality of output bits using the control value to compensate for an error due to a slew rate and to generate a next plurality of output bits as the digitally approximated moving signal.

5,589,833

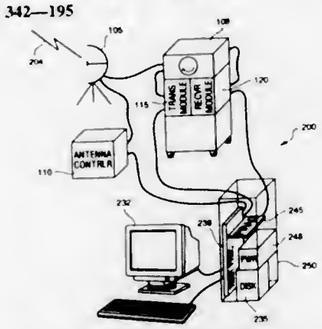
RADAR ACQUISITION SYSTEM

Mitchell A. Randall, Longmont, and Eric Loew, Boulder, both of Colo., assignors to University Corporation for Atmospheric Research, Boulder, Colo.

Filed Apr. 21, 1995, Ser. No. 426,030

Int. Cl.[6] G01S *13/95*

U.S. Cl. 342—195 **22 Claims**



1. A radar acquisition system comprising:

an electronic circuit module operatively connected to a host processor, wherein said electronic circuit module contains a plurality of signal processing components thereon;

means for receiving a radio wave;

means for converting said radio wave into an analog intermediate frequency signal; and

means for producing in-phase and quadrature signal components from said analog intermediate frequency signal by way of at least one of said plurality of signal processing components independent of any radar signal processing component external to said electronic circuit module and said host processor.

5,589,834

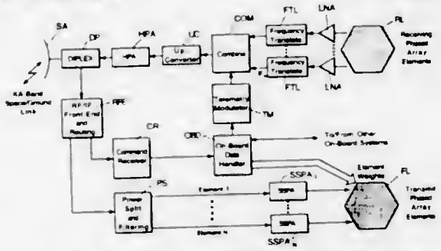
COST EFFECTIVE GEOSYNCHRONOUS MOBILE SATELLITE COMMUNICATION SYSTEM

Aaron Weinberg, Potomac, Md., assignor to Stanford Telecommunications, Inc., Reston, Va.

Filed Apr. 22, 1994, Ser. No. 231,711

Int. Cl.[6] H04B *7/185*

U.S. Cl. 342—354 **10 Claims**



1. A satellite communication system for providing communication links between a plurality of earth-based low power transceivers and external cellular and terrestrial networks comprising:

one or more satellites in geosynchronous orbit and inclined at a predetermined angle greater than 0 relative to earth, each satellite having a multi-element phased array antenna and transmit and receive circuits selectively connected to said multi-element phased array antenna for providing spatially

discriminated spot radiation beams on the earth's surface, and

a steerable spaced-to-ground antenna and transmitter-receiver circuitry connected thereto,

at least one gateway ground terminal having means for:

(1) performing uplink phasing of said phased array antenna for directive satellite transmissions to desired user locations,

(2) tracking the moving satellites via combination of range and doppler tracking,

(3) steering said space-to-ground antenna in accordance with satellite motion,

(4) performing all ground-beamforming associated with user inbound transmissions,

(5) performing all user signal modulation and demodulation,

(6) providing the necessary ground interfaces with the external cellular and terrestrial networks, and

a plurality of earth-based low power transceiver means for one and two-way communications via said selected elements of said phased array antenna.

5,589,835

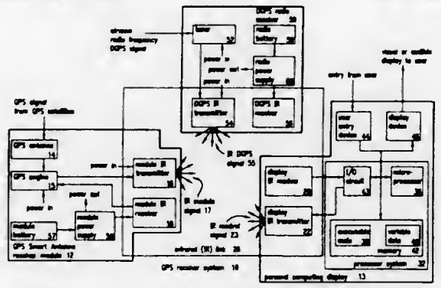
DIFFERENTIAL GPS RECEIVER SYSTEM LINKED BY INFRARED SIGNALS

David R. Gildea, Menlo Park, and Lloyd H. Banta, Palo Alto, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Dec. 20, 1994, Ser. No. 359,604

Int. Cl.[6] G01S *5/02*

U.S. Cl. 342—357 **15 Claims**



1. A GPS receiver system to determine and display a geographical differential Global Positioning System (DGPS) location where the system is interconnected by an airwave infrared (IR) link, the system including:

a DGPS radio receiver to receive an airwave radio frequency DGPS signal from a source external to the system, said airwave DGPS signal including DGPS corrections, and to provide an airwave infrared (IR) DGPS signal having data indicative of said DGPS corrections;

a GPS Smart Antenna module to receive an airwave GPS signal including GPS location information from a plurality of GPS satellites, to receive said IR DGPS signal, to use said DGPS corrections and said GPS location information to compute said DGPS location, said DGPS location having a better location accuracy better than a location computed from said GPS location information without said DGPS corrections, and to provide data indicative of said DGPS location in an airwave infrared (IR) module signal; and

a personal computing display to receive said IR module signal and said IR DGPS signal and to display said DGPS location in a form that is visibly or audibly perceptible to a human being.

5,589,836

METHOD FOR SELECTING SIGNALS FROM NAVIGATION SATELLITES

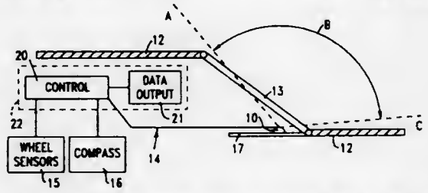
Guenter Noetzel, Dickholzen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 6, 1995, Ser. No. 398,701

Claims priority, application Germany, Apr. 29, 1994, 44 15 083.0

Int. Cl.[6] H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **10 Claims**



1. A method for selecting signals from navigation satellites, comprising the steps of:

arranging an antenna of a vehicle at a location for receiving, directly and indirectly, signals transmitted by the navigation satellites;

determining a momentary direction of travel of the vehicle;

determining a momentary direct receiving range of the antenna relative to the momentary direction of travel of the vehicle;

determining which of the navigation satellites are located within the momentary direct receiving range of the antenna;

selecting received signals, corresponding to those navigation satellites that are determined to be located within the momentary direct receiving range of the antenna, from the directly and indirectly received signals;

evaluating the selected received signals; and

determining a position of the vehicle as a function of the selected signals.

5,589,837

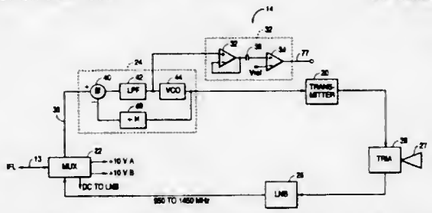
APPARATUS FOR POSITIONING AN ANTENNA IN A REMOTE GROUND TERMINAL

Mohammad Soleimani, Silver Spring; John E. Corrigan, III, Chevy Chase; Mohammad Bukhari, Germantown, and David A. Roos, Boyds, all of Md., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Feb. 6, 1995, Ser. No. 384,060

Int. Cl.[6] H01Q *3/00*

U.S. Cl. 342—359 **20 Claims**



1. An apparatus for aiding the orientation of a directional antenna of a remote ground terminal which transmits and receives a signal via said antenna, said apparatus comprising:

a signal generator for producing a frequency variable reference signal having a variable duty cycle of frequency,

a controller coupled to said signal generator, said controller operative to analyze said signal received via said antenna and to vary the duty cycle of said reference signal in accordance with an identification tag forming part of said signal received

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via said antenna, said identification tag identifying a designated central hub station which originates said signal to be transmitted to said remote ground terminal, and

a detector coupled to said signal generator to receive said reference signal, said detector producing an output signal having an average amplitude proportional to the duty cycle of said reference signal,

wherein said controller commands said signal generator to produce a reference signal having a first duty cycle when a signal having an identification tag not corresponding to the designated central hub station is received by said antenna, and to produce a reference signal having a second duty cycle when a signal having an identification tag corresponding to the designated central hub station is received by said antenna, said first duty cycle causing the average amplitude of said output signal of said detector to equal a first value and said second duty cycle causing the average amplitude of said output signal of said detector to equal a second value.

5,589,838

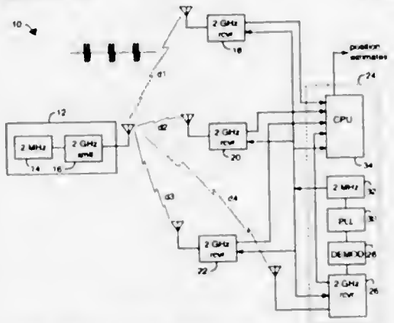
SHORT RANGE RADIO LOCATOR SYSTEM

Thomas E. McEwan, Livermore, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 300,909, Sep. 6, 1994. This application Aug. 3, 1995, Ser. No. 510,979

Int. Cl.[6] G01S *1/24*

U.S. Cl. 342—387 **5 Claims**



1. A radio location system, comprising:

a roving transmitter with an unknown position and providing for periodic bursts of wireless radio frequency (RF) carrier transmissions at a first repetition rate;

a plurality of receivers with known locations and providing for the reception of said bursts of RF carrier transmissions according to a sample gate input for each;

local oscillator generation means connected to provide a single sample gate signal to each of said sample gate inputs at a second repetition rate that is different than said first repetition rate, wherein said first and second repetition rates are in phase once each "n" cycles of said first repetition rate;

digital output means connected to each of the receivers for binary signaling TRUE/FALSE of whether the reception of one of said bursts of said RF carrier transmissions arrived simultaneously with one of said sample gate signals; and

computer means for storing representations which of the plurality of receivers and what particular cycles "0 . . . n" of said first repetition rate provided a TRUE binary signal connected from the digital output means, and for computing a relative difference in the time-of-flight of said RF carrier transmissions to each of the plurality of receivers from said stored representations, and for computing a position estimate of the roving transmitter from said relative difference and said known positions of each of the plurality of receivers.

5,589,839

RADIO ANTENNA ARRANGEMENT LOCATED NEXT TO VEHICLE WINDOW PANELS

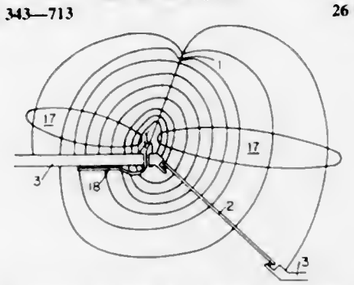
Heinz Lindenmeier, Fürstenrieder Strasse 7 b, D-8033 Planegg; Jochen Hopf, Salmdorfer Strasse 3 a, D-8013 Haar, and Leopold Ritter, Ludwig-Thoma-Strasse 9, D-8031 Gilching, all of Germany

Continuation of Ser. No. 185,955, Mar. 7, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,021

Claims priority, application Germany, May 18, 1992, 42 16 377.3

Int. Cl.[6] H01Q *1/32*

U.S. Cl. 343—713 **26 Claims**



1. An antenna arrangement for a motor vehicle, said antenna arrangement comprising

an exterior radio antenna (1) for radiating electromagnetic waves in a radio frequency broadcast range;

a vehicle window pane (2) closing an opening provided in a metallic body (3) of the motor vehicle, the exterior radio antenna (1) being arranged on one of the metallic body (3) and the vehicle window pane (2) and located outside of an interior of the motor vehicle, and

means for shielding said interior of the motor vehicle from the electromagnetic waves radiated by the exterior radio antenna (1), said means for shielding comprising a two-dimensional component (4) arranged on at least a portion of the vehicle window pane (2) and made of a conductive material substantially optically transparent but substantially opaque to said electromagnetic waves in the radio broadcast frequency range radiated by the exterior radio antenna (1) and an electrically conductive capacitive connection (11,12,13) for said electromagnetic waves in the radio broadcast frequency range between said two-dimensional component (4) and said metallic body (3), wherein said two-dimensional component (4) has a sufficiently low surface resistance in the radio broadcast frequency range and said electrically conductive capacitive connection (11,12,13) of the two-dimensional component (4) to the metallic body (3) is of sufficiently low impedance in the radio broadcast frequency range so that electric and magnetic fields radiated by the exterior radio antenna (1) in the radio broadcast frequency range are effectively prevented from penetrating into said interior of said motor vehicle.

5,589,840

WRIST-TYPE WIRELESS INSTRUMENT AND ANTENNA APPARATUS

Teruhiko Fujisawa, Nagano-ken, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 81,380, Jun. 29, 1993, Pat. No. 5,465,098. This application May 24, 1995, Ser. No. 449,482

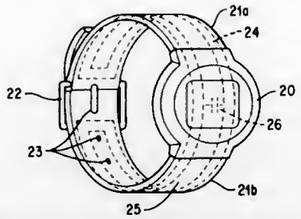
Claims priority, application Japan, Nov. 5, 1991, 3-288763; Jul. 19, 1994, 6-167095

Int. Cl.[6] H01Q *1/12;13/10*

U.S. Cl. 343—718 **8 Claims**

1. A wrist-type wireless instrument comprising:

a casing containing a circuit board;



a wrist band connected to said casing, said casing and said wrist band defining a loop when said instrument is in use;

a conductive plate having a slot and disposed within said casing and said wrist band, said conductive plate configured and disposed so as to function as a slot antenna; and

a capacitive element electrically connected to opposing portions of said conductive plate, said opposing portions being separated by said slot;

wherein said circuit board is arranged so as to be disposed on an inner side of said loop and so as to function as an antenna reflector when said instrument is in use, and wherein said capacitive element is disposed near an approximately central portion of said circuit board.

5,589,841

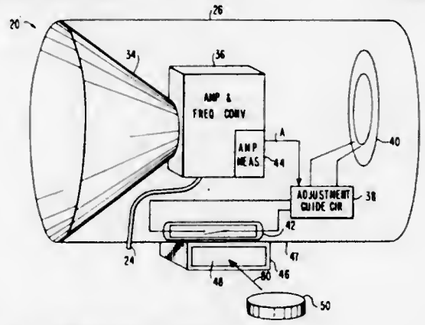
SATELLITE ANTENNA WITH ADJUSTMENT GUIDANCE SYSTEM

Takaaki Ota, Englewood, N.J., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Continuation of Ser. No. 181,915, Jan. 18, 1994, Pat. No. 5,493,310. This application Nov. 30, 1995, Ser. No. 565,343

Int. Cl.[6] H01Q *3/02*

U.S. Cl. 343—760 **8 Claims**



1. A satellite antenna comprising:

a support;

an antenna assembly adjustably mounted on said support and exhibiting a changeable orientation with respect to a satellite broadcast signal, said assembly including a housing, a low noise amplifier within said housing for receiving and amplifying said satellite broadcast signal, and a dish antenna arranged with respect to said low noise amplifier so as to convergingly reflect said satellite broadcast signal toward said low noise amplifier;

adjustment guidance means provided within said housing for emitting an adjustment signal that is responsive to a characteristic of said satellite broadcast signal received by said low noise amplifier to provide an indication of the orientation of said antenna assembly; and

switch means for selectively activating said adjustment guidance means comprising a switch element provided within said housing and switch control means disposed externally of said housing, said switch element having a plurality of states and said switch control means being operable to select the state of said switch element without a mechanical connection between said switch element and said switch control means.

5,589,842

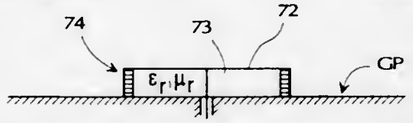
COMPACT MICROSTRIP ANTENNA WITH MAGNETIC SUBSTRATE

Johnson J. H. Wang, Marietta, and Victor K. Tripp, Tucker, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation of Ser. No. 335,489, Nov. 7, 1994, abandoned, which is a division of Ser. No. 217,006, Mar. 23, 1994, Pat. No. 5,453,752, which is a continuation of Ser. No. 7,409, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 798,700, Nov. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 695,686, May 3, 1991, abandoned. This application Jan. 30, 1996, Ser. No. 594,330

Int. Cl.[6] H01Q *1/38;25/04;1/36*

U.S. Cl. 343—787 **6 Claims**



1. A compact microstrip antenna for mounting to one side of a surface of a structure, comprising:

one or more antenna elements; and

a ferromagnetic substrate adapted for positioning the antenna elements a selected distance from the surface, said ferromagnetic substrate having a relative permittivity and a relative permeability, said relative permittivity being roughly equal to said relative permeability.

5,589,843

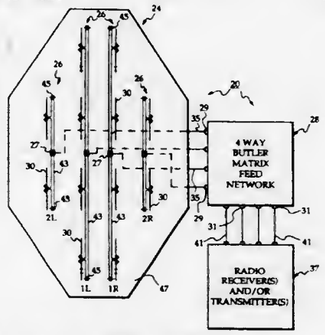
ANTENNA SYSTEM WITH TAPERED APERTURE ANTENNA AND MICROSTRIP PHASE SHIFTING FEED NETWORK

Sheldon K. Meredith; Pitt W. Arnold, both of Phoenix, Ariz.; Warren F. Hunt, Lakewood; Kevin J. Connolly, Freehold, both of N.J., and Kevin M. Gaukel, Tempe, Ariz., assignors to Radio Frequency Systems, Inc., Marlboro, N.J.

Filed Dec. 28, 1994, Ser. No. 365,590

Int. Cl.[6] H01Q *9/16*

U.S. Cl. 343—820 **15 Claims**



1. An antenna system (20), comprising:

A) a space-tapered multi-beam antenna (24) having:

1) N co-linear arrays (26) with innermost co-Linear arrays and outer co-linear arrays, each co-linear array having at least one electromagnetic radiating element (30), where N is an integer greater than 2, and wherein the number of radiating elements monotonically increases from the outer-

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most co-linear arrays toward the innermost co-linear arrays to form a monotonically increasing co-linear array,

2) means (43) for connecting each radiating element within a co-linear array to all other radiating elements in the same array, and

3) an electrically conductive backplane onto which the co-linear arrays are positioned with respect thereto;

B) a microstrip fabricated phase array feed network (28) having N radio receiver/transmitter ports (31) for connection to receiver or transmitter equipment, and N antenna ports (29), each antenna port for connection to one of the N co-linear arrays (26), the phase array feed network having means for phase shifting any outgoing signal at one of the receiver/transmitter ports with respect to each of the N antenna ports, and vice versa, so as to electronically steer the radiating pattern of the antenna to any one of the N main lobes; and

C) means (35) for interconnecting the antenna port (29) to the means (43) for connecting the radiating elements in each co-linear array;

whereby the antenna system radiation pattern for each of the N main lobes has one or more sidelobes that each are attenuated with respect to the corresponding main lobe by an amount greater than the sidelobes generated by an N co-linear array antenna with a fixed number of radiating elements per co-linear array.

5,589,844

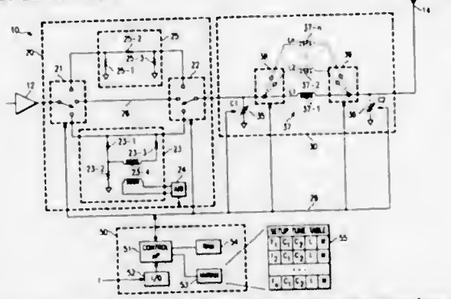
AUTOMATIC ANTENNA TUNER FOR LOW-COST MOBILE RADIO

Donald K. Belcher, Rogersville, Tenn., and David C. Bailey, Cocoa Beach, Fla., assignors to Flash Comm, Inc., Melbourne, Fla.

Filed Jun. 6, 1995, Ser. No. 470,542

Int. Cl.[6] H01Q *1/50*

U.S. Cl. 343—860 **9 Claims**



1. An antenna tuner for automatically matching the impedance of an electrically short antenna to the impedance of an output stage of a transmitter amplifier, the antenna tuner operating over a range of frequencies, the automatic antenna tuner comprising:

an impedance matching network consisting of a pair of shunt capacitive circuit elements and at least one inductive circuit element, the capacitance of at least one of the capacitive circuit elements being mechanically adjustable in increments over a range of incremental capacitance values, a first capacitive circuit element of said pair of shunt capacitive circuit elements being disposed between a first node and a ground reference node, a second capacitive circuit element of said pair of shunt capacitive circuit elements being disposed between a second node and the ground reference node, and a series inductive circuit element being disposed between the first and second nodes, the second node for connecting to the antenna;

a resistive bridge network, disposed between the output stage of the transmitter amplifier and the first node, the resistive bridge network providing a bridge output signal indicating a degree of match between an impedance presented by the output stage of the amplifier and the impedance matching network to the impedance presented by the antenna;

means for electromechanically adjusting the capacitance of at least one of the first or second capacitive elements, by reading a capacitance set signal indicating a capacitance value and by then adjusting the capacitance of said at least one adjustable capacitive circuit element to a selectable capacitance value in the range of incremental capacitance values;

non-volatile storage means, for storing a plurality of optimum capacitance values, with at least one optimum capacitance value being associated with one frequency in the range of frequencies to which the antenna can be tuned; and

control means, for performing an antenna set-up procedure whereby a set of optimum capacitance values is determined for each frequency in the range of frequencies, the set of optimum capacitance values being then stored in the non-volatile storage means, the optimum capacitance value for each frequency being determined by serially selecting each one of the incremental capacitance values in the range of capacitance values, setting said at least one adjustable capacitve circuit element to that incremental capacitance value by operating the means for mechanically adjusting the capacitance, and then reading the output signal from the resistive bridge network, to determine which incremental capacitance value provides a best impedance match to the antenna, and upon receiving an instruction to tune the antenna to a particular frequency in the range of frequencies, reading the optimum capacitance value for the particular frequency, and for providing the capacitance set signal to the means for electromechanically adjusting.

5,589,845

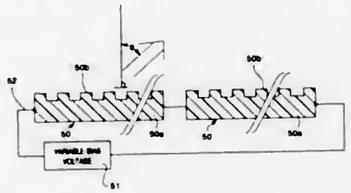
TUNEABLE ELECTRIC ANTENNA APPARATUS INCLUDING FERROELECTRIC MATERIAL

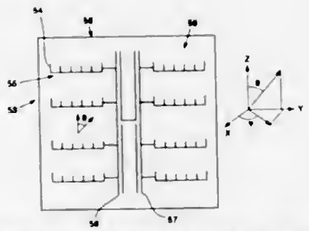
Robert M. Yandrofski, Littleton; John C. Price; Frank Barnes, both of Boulder; Allen M. Hermann, Golden, and James F. Scott, Boulder, all of Colo., assignors to Superconducting Core Technologies, Inc., Golden, Colo.

Division of Ser. No. 983,632, Dec. 1, 1992, Pat. No. 5,472,935. This application Jun. 7, 1995, Ser. No. 484,012

Int. Cl.[6] H01Q *15/02*

U.S. Cl. 343—909 **24 Claims**





1. A tuneable electric antenna apparatus for passing radio frequency energy comprising at least a first tuneable electric antenna component that includes an elongated base portion of a thin film ferroelectric material having a dielectric property, the dielectric property of the ferroelectric material being a function of a voltage applied to the thin film ferroelectric material, a plurality of elements extending from the base portion and spaced apart from one another at a predetermined interval along the length of the base portion, the predetermined interval between each of the plurality of elements providing a predetermined time delay for radio frequency energy, the predetermined time delay between each of the plurality of elements causing the radio frequency energy to be passed at a common predetermined angle with respect to each of the plurality of elements, wherein, when a predetermined voltage is applied to the thin film ferroelectric material, the dielectric property of the thin film ferroelectric material located between each of the plurality of elements changes and the radio frequency energy passes through the thin film ferroelectric material located between each of the plurality of elements to yield said common predetermined angle.

5,589,846

HEAD MOUNTED IMAGE DISPLAY

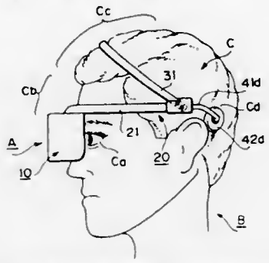
Hiroyoshi Kobayashi, Hachioji, Japan, assignor to Olumpus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 404,149

Claims priority, application Japan, Mar. 17, 1994, 6-047187

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—8 **23 Claims**



1. A head mounted image display comprising:

an image display body for projecting an image on each eye of an observer; and

mount supporting means for removably mounting said image display body on a head of the observer including the observer's face, said mount supporting means having, at least:

a sinciput contact member to be brought into contact with the head of the observer between a forehead and a crown thereof:

a left occiput contact member to be brought into contact, at a contact section thereof, with a lower portion of a left occiput of the observer located near and behind a left ear of the observer; and

a right occiput contact member to be brought into contact, at a contact section thereof, with a lower portion of a right occiput of the observer located near and behind a right ear of the observer,

wherein when said head mounted image display in mounted on the head of the observer so that said sinciput contact member, said contact section of said left occiput member and said contact section of said right occiput contact member come into contact with corresponding parts of the head, said image display body is supported by a contact force of said sinciput contact member and by resistance forces produced by the force of gravity acting on said image display body, said resistance forces acting against the contact sections of said left occiput contact member and said right occiput contact member at the respective lower portions of the left occiput and the right occiput of the observer, and said left occiput contact member and said right occiput contact member are spaced from each other with respect to a route along a surface of a middle occiput of the observer so that the middle occiput is free from contact with any member of said head mounted image display when mounted on the head of the observer.

5,589,847

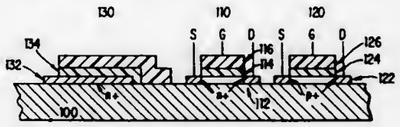
SWITCHED CAPACITOR ANALOG CIRCUITS USING POLYSILICON THIN FILM TECHNOLOGY

Alan G. Lewis, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1991, Ser. No. 764,292

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—98 **27 Claims**



1. An analog switched capacitor circuit comprising:

at least one polysilicon thin film capacitor means;

at least one polysilicon thin film transistor switch means;

at least one polysilicon thin film amplifier means; and

interconnection means for interconnecting the capacitor means, the transistor switch means, and the amplifier means so that the output of said circuit is set by the accumulation of electrical charge on said capacitor means under the control of said transistor switch means and said amplifier means;

said capacitor means, said transistor switch means, said amplifier means, and said interconnection means all being formed on a common substrate.

5,589,848

ELECTRONIC EQUIPMENT HAVING A DISPLAY DEVICE

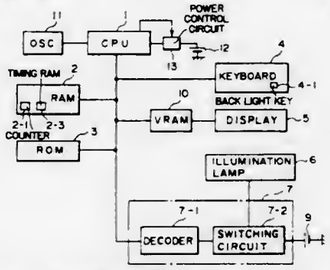
Hirokimi Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 241,679, May 12, 1994, abandoned, which is a continuation of Ser. No. 826,688, Jan. 28, 1992, abandoned, which is a continuation of Ser. No. 430,975, Nov. 1, 1989, abandoned, which is a continuation of Ser. No. 81,453, Aug. 4, 1987, abandoned. This application Apr. 21, 1995, Ser. 427,715

Claims priority, application Japan, Aug. 7, 1986, 61-184170

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—102 **8 Claims**



1. Electronic equipment comprising:

a keyboard for entering a plurality of kinds of data by a same key, comprising a selecting key for selecting one of said plurality of kinds of data to be entered by the same key;

display means for displaying data, said display means having a display screen;

illumination means for illuminating said display screen of said display means, having a first illumination state and a second illumination state;

a power supply included within said electronic equipment for supplying power to said electronic equipment;

first manual time setting means for setting an illumination time of said illumination means;

second manual time setting means for setting a power supply time of said power supply for said electronic equipment;

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control means for changing an illumination state of said illumination means after completion of the illumination time set by said first manual time setting means to reduce power consumption by said illumination means; and

power supply control means for causing said power supply to stop the power after completion of the power supply time set by said second manual time setting means.

5,589,849

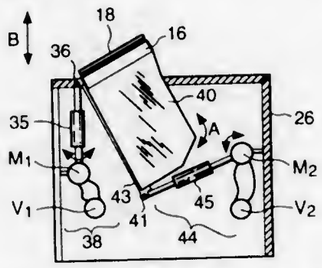
DISPLAY MONITOR POSITION ADJUSTMENT APPARATUS

Richard J. Ditzik, 3143 Carnegie Ct., San Diego, Calif. 92122

Continuation of Ser. No. 771,856, Oct. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 375,366, Jul. 3, 1989, abandoned. This application Jul. 25, 1994, Ser. No. 280,148

Int. Cl.[6] G09G *1/06*

U.S. Cl. 345—126 **4 Claims**



1. A display device position adjusting apparatus, which comprises:

a. a table support structure defining a horizontal surface member and a plurality of vertical support members fixed to the horizontal surface, the horizontal surface member having an opening sufficiently large that the display device can fit inside the opening and moved in a multiplicity of orientations;

b. means for adjusting the display device through a large range of orientations, wherein the adjusting means is attached to the table support structure, such that the display device can be adjusted to position well above and below the table support structure horizontal surface an can be locked into a fixed position, and wherein the adjusting means provides:

(1) a front reversible motor connected to a display elevation linkage means and front display hinge, for elevation adjustment, and

(2) a rear reversible motor connected to a display inclination linkage means and rear hinge, for inclination rotation adjustment, wherein each linkage means is connected to the to a display device cradle in which the display device sits;

c. said table support structure being suitable for a computer desk, capable of supporting computer related devices; and

d. said adjusting means may be comprised of a plurality of electrical and mechanical adjustment means.

5,589,850

APPARATUS FOR CONVERTING TWO DIMENSIONAL PIXEL IMAGE INTO ONE-DIMENSIONAL PIXEL ARRAY

Lie-Der Lin, Taipei Hsien, and Jiunn-Ming Ju, Tainan Hsien, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed Sep. 26, 1994, Ser. No. 313,524

Int. Cl.[6] G09G *5/36*

U.S. Cl. 345—132 **10 Claims**

1. A converter apparatus for use with a computer display screen to convert coordinates of two-dimensional pixels of a graphic

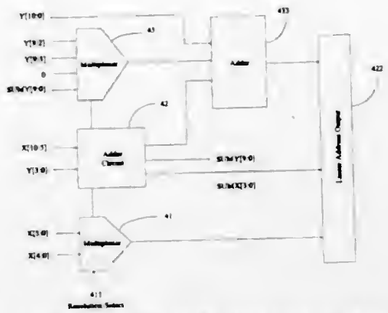


image to linear address, each of said pixels being represented by a first coordinate and a second coordinate, said first coordinate having an X-bit address and said second coordinate having a Y-bit address, said X bits consisting of lower X bits and higher X bits, and said Y bits consisting of lower Y bits and higher Y bits, each of said linear addresses having Z bits consisting of lower Z bits, middle Z bits, and higher Z bits, said converter apparatus comprising:

(a) a first circuit to receive said lower X bits of various resolutions as inputs, and to output said lower Z bits;

(b) a second circuit to receive said higher X bits and said lower Y bits as inputs, also of various resolutions, and to output said middle Z bits and a first carrier bit;

(c) a third circuit to receive said upper Y bits and a portion of said lower Y bits, also of various resolutions, and null bits as inputs, and to output precursory higher Z bits;

(d) a first adder circuit to receive said precursory Z bits, said Y bits and said first carrier bit as inputs, and to output said higher Z bits; and

(e) a second adder circuit to receive said lower Z bits, said middle Z bits and said higher Z bits as inputs, and to output said Z-bit linear address;

(f) wherein said first circuit, said second circuit, and said third circuit all being connected to a resolution select to select one of said inputs respectively connected thereto;

(g) said second circuit comprises a second multiplexer, a third multiplexer, a fourth multiplexer, a third adder circuit, and a logical operation circuit;

(h) said third adder circuit being adapted to receive outputs from said second, third, and fourth multiplexers as inputs, and to output said middle Z bits minus the highest middle Z bit, a special Z bit corresponding said highest middle Z bit, and a second carrier bit; and

(i) said logical operation circuit being adapted to receive said special Z bit, said second carrier bit, and a portion of said higher X bits as inputs, and to output said first carrier bit and said highest middles Z bits.

5,589,851

MULTI-LEVEL TO BI-LEVEL RASTER SHAPE CONVERTER

Jacobo Valdés, Palo Alto, and Eduardo Martinez, Los Altos, both of Calif., assignors to Ductus Incorporated, Mountain View, Calif.

Filed Mar. 18, 1994, Ser. No. 210,869

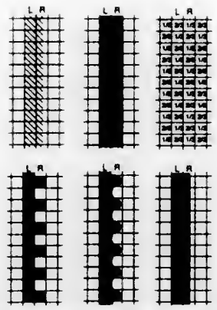
Int. Cl.[6] G09G *5/36*

U.S. Cl. 345—136 **14 Claims**

1. A method of generating a bi-level raster shape from a shape outline, the method comprising the steps of:

positioning the shape outline relative to a pixel grid;

identifying a bounding region of said pixel grid which totally encloses the positioned shape outline, said bounding region characterized by the set of pixels which are in said bounding region, wherein each pixel in the set of pixels is characterized by a pixel position relative to said bounding region;



generating a multi-level raster shape representative of the shape outline, said multi-level raster shape storable as an array of multi-level coverage values, wherein each multi-level coverage value is associated with a pixel of said set of pixels and each multi-level coverage value is selected from a plurality of more than two possible coverage values;

identifying, using results of said step of positioning, at least one pair of adjacent pixels with a drop-out warning;

flagging at least one pixel of each pair of pixels which were identified in the step of identifying;

calculating, from a variable threshold function, a threshold value for each pixel in said set of pixels, said variable threshold function being variable in that not all pixels in said set of pixels obtain the same threshold value; and

rounding each multi-level coverage value in said array of multi-level coverage values to a bi-level coverage value selected from a covered value and an uncovered value, wherein said multi-level coverage value is rounded to said uncovered value when said multi-level coverage value is between said uncovered value and said threshold value, and said multi-level coverage value is rounded to said covered value when said multi-level coverage value is not between said uncovered value and said threshold value, said rounding step including the step of rounding a multi-level coverage value to said covered value regardless of its value if the pixel associated with said multi-level coverage value being rounded was flagged in the step of flagging.

5,589,852

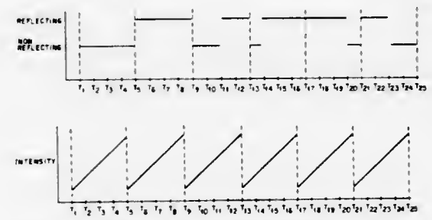
APPARATUS AND METHOD FOR IMAGE PROJECTION WITH PIXEL INTENSITY CONTROL

E. Earle Thompson, Dallas, and Thomas W. DeMond, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 995,570, Dec. 22, 1992, which is a continuation of Ser. No. 711,558, May 30, 1991, which is a continuation of Ser. No. 315,632, Feb. 27, 1989. This application Jun. 7, 1995, Ser. No. 472,377

Int. Cl.[6] G09G *3/34;5/10*

U.S. Cl. 345—147 **9 Claims**



1. A method for varying intensity of a pixel comprising:

a. varying the intensity of light produced from at least one light source such that said light source produces at least two distinct levels of illumination along a first optical path;

b. reflecting light from said light source in said first optical path to form said pixel in a second optical path; and

c. varying the amount of time said light source is reflected into said second optical path.

5,589,853

ON-SCREEN DISPLAY APPARATUS WITH SEQUENTIALLY DISPLAYED PICTURE ADJUSTMENT MESSAGES

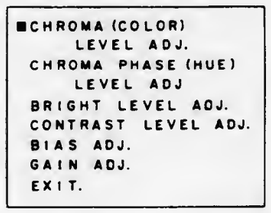
Mikio Fujiki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 1,278, Jan. 7, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 290,225

Claims priority, application Japan, Jan. 7, 1992, 4-018539

Int. Cl.[6] G09G *5/02*

U.S. Cl. 345—150 **4 Claims**



1. An on-screen display apparatus that guides an operator step-by-step through a process of picture quality adjustments of a television monitor, the apparatus comprising:

memory means for storing messages which instruct the operator as to each step of a step-by-step procedure to follow to accurately perform the picture quality adjustments of at least chroma, hue, brightness, contrast, bias, and gain;

a CPU for controlling the memory means in such a manner as to retrieve the messages from the memory means sequentially according to the step-by-step procedure for performing the picture quality adjustments and to display the retrieved messages on the television monitor;

a remote controller having a key input unit manipulated by the operator to transmit a desired command to the CPU, wherein the key input unit has pattern selector keys, a message/enter key, and arrow keys, and wherein the messages stored in the memory means are retrieved and displayed in response to manipulation of the key input unit by the operator; and

a signal generator for generating a predetermined pattern in response to a pattern signal from the key input unit and for providing the predetermined pattern to the television monitor through the CPU, wherein

the predetermined pattern generated by the signal generator includes a gray scale pattern having an array of gray scale levels ranging from white to black, the gray scale pattern being used in the picture quality adjustment of the bias, and

the picture quality adjustment of the gain is used for setting a white level gain.

5,589,854

TOUCHING FEEDBACK DEVICE

Ming-Chang Tsai, Fl. 12th, No. 138, Sec. 2, King San South Road, Taipei, Taiwan

Filed Jun. 22, 1995, Ser. No. 493,547

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—161 **1 Claim**

1. A tactile feedback device, comprising:

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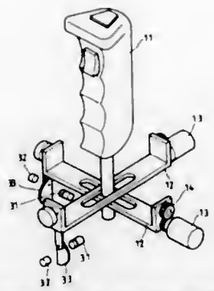


a joystick assembly having a joystick handle and a pair of orthogonally disposed yoke components installed adjacent a bottom end of said joystick handle and adapted for corresponding displacement therewith, each of said yoke components having a driving motor connected to one end thereof through reduction gears and a variable resistor coupled to an opposing end of said yoke for generating a position signal, said pair of yokes being displaceable responsive to rotation of said driving motors for corresponding displacement of said joystick handle; and

a force feedback controlling system including (1) a central processing unit connected to a computer, (2) an A/D converter having a pair of inputs respectively coupled to said variable resistors of said pair of yokes and an output coupled to said central processing unit for converting respective position signals to digital signals, (3) a PWM driver circuit having an input coupled to said central processing unit, and (4) a bridge amplifier having an input coupled to said PWM driver and a pair of outputs respectively coupled to said driving motors, each of said driving motors receives a relative average current according to a simulation condition established by the computer for obtaining a relative rotating speed thereof to generate a relative feedback force to said joystick handle.

5,589,855

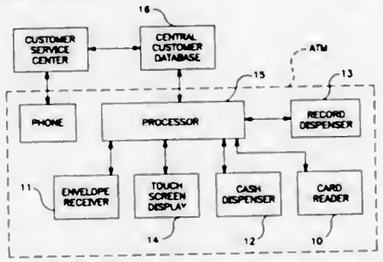
VISUALLY IMPAIRED CUSTOMER ACTIVATED TERMINAL METHOD AND SYSTEM

Paul Blumstein, Palos Verdes; Randy Cole, Los Angeles; James Cook, Manhattan Beach; Ashwin Doshi, Cerritos; Michael Grandcolas, Santa Monica; Stephen Gryte, Los Angeles; Frank McCallick, Encino; Marvin Moskowitz, West Hills; Howard Schechtman, Agoura Hills; Michael Sears, Torrance; Steve Shulman, West Hollywood, all of Calif.; Walter Greenberg, Chicago, Ill.; Patricia Millo, Port Washington, N.Y.; Paul Sidikman, Livingston, N.J.; Alex J. Virnig, Northridge; Paul Witman, Simi Valley, both of Calif., and Valerie Fenster, New York, N.Y., assignors to Transaction Technology, Inc., Santa Monica, Calif.

Filed Aug. 14, 1992, Ser. No. 930,319

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **23 Claims**



1. A method of inputting any multidigit number into a processing machine having a touch responsive interface comprising the steps of:

a) transmitting a signal representing one digit of said number to the processing machine by touching a first location of said touch responsive interface a number of times equal to said digit; and

b) transmitting a signal to the processing machine indicating the completion of said inputting of said digit by touching a second location on said touch responsive interface one time,

c) repeating steps a) and b) for each digit of said multidigit number: and

d) transmitting a signal to the processing machine indicating the completion of said inputting of said multidigit number by touching a third location on said touch responsive interface

wherein said first, second and third locations of said touch responsive interface are physically distinct areas of said touch responsive interface and are disposed relative to borders of said touch responsive interface.

5,589,856

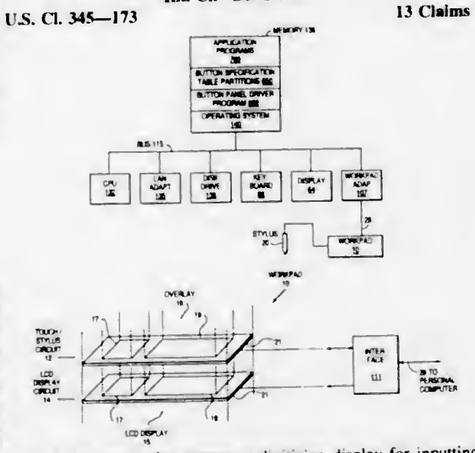
SYSTEM & METHOD FOR DYNAMICALLY LABELED TOUCH SENSITIVE BUTTONS IN A DIGITIZING DISPLAY

Frank L. Stein, Vienna, Va., and Guy F. Verrier, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 55,067, Apr. 29, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 378,306

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **13 Claims**



1. A data processing system, a digitizing display for inputting two simultaneous touch inputs, comprising:

a display coupled to a computer, having a display surface partitioned into a main panel display region and a button panel display region;

a touch overlay coupled to said computer, having a touch input surface partitioned into a main panel touch region juxtaposed with said main panel display region, and partitioned into a button panel to each region juxtaposed with said button panel display region;

means for electrically isolating the main panel and button regions in the display and touch overlay;

a button panel driver program stored in said computer, for defining a button touch area in said button panel touch region in accordance with a button specification table, for outputting a button value when said button touch area receives a touch input;

said buttton panel driver program defining a button display area in said button panel display region, juxtaposed with said button touch area, said button display area for displaying a button indicium representing said button value and identifying the location of said button touch area;

said computer receiving a first touch input in said main panel touch region and a simultaneous second touch input in said button touch area and in response thereto, outputting a panel value and said button value, the multiple, simultaneous panel and button values being separately identified in a touch circuit;

said computer storing a default button specification table describing a plurality of button touch areas and corresponding button display areas in the event a button specification table is not available;

said button panel driver program using said default table to reconfigure said plurality of button touch areas in said touch overlay and said corresponding button display areas in said display;

an application program stored in said computer, having an alternate button specification table describing a plurality of alternate button touch areas and corresponding alternate button display areas for selection by a user; and

said button panel driver program using said alternate table to configure said plurality alternate button touch areas in said touch overlay and said corresponding alternate button display areas in said display when selected by the user.

5,589,857

COORDINATE INPUT DEVICE

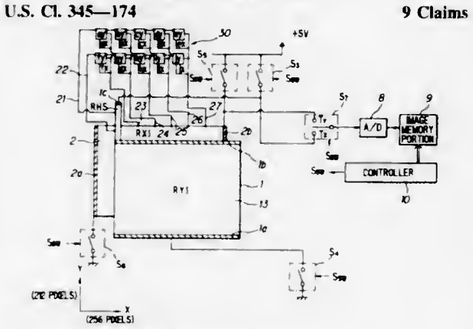
Makoto Tanahashi, Kanagawa, and Kazuyasu Takenaka, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,047

Claims priority, application Japan, Dec. 7, 1993, 5-339879

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—174 **9 Claims**



1. A coordinate input device comprising:

an input surface in the form of a rectangle formed by overlapping a first input detecting member and a second input detecting member so that they will not contact each other, first and second electrodes being provided on both side portions at the shorter sides of a rectangular resistive surface of said first input detecting member, a voltage being applied between said first and second electrodes, third and fourth electrodes being provided on both side portions at the longer sides of a rectangular resistive surface of said second input detecting member, a fifth electrode being connected to said fourth electrode through a resistive portion, a voltage being applied between said second and fifth electrodes, the resistive surfaces of the first and second input detecting members contacting each other at an area on said input surface which has been pushed, the coordinate of the input in the X-Y coordinate system on said input surface being obtained from the resistance at said first or second electrode of said first input detecting member and the resistance detected at said second or fifth electrode of said second input detecting member at that time; and

at least one face-plate switch formed by overlapping at least one first face-plate switch conductor portion and at least a second switch conductor portion so that they will not contact each other, said first switch conductor portion being electrically connected to a predetermined position in the area extending from said first electrode of said first input detecting member through the resistive portion up to said second electrode, said second switch conductor portion being electrically connected to a predetermined position in the area extending from said fourth electrode of said second input detecting member through the resistive portion up to said fifth electrode,

wherein when a push on said face-plate switch causes said first and second face-plate switch conductor portions to contact each other, the input using said face-plate switch is detected from the resistance detected at said second or fifth electrode of said second input detecting member.

5,589,858

INFORMATION RECORDING APPARATUS

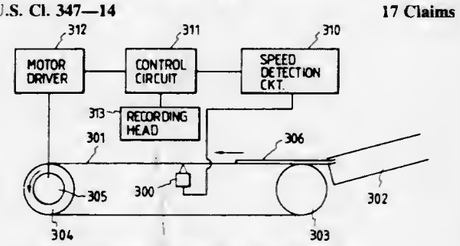
Hidejiro Kadowaki; Hiroshi Sugiyama, both of Yokohama; Yasuhiko Ishida, Tokyo, and Makoto Takamiya, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 714,378, May 22, 1991, abandoned. This application Mar. 15, 1994, Ser. No. 213,998

Claims priority, application Japan, May 22, 1990, 2-132887; May 22, 1990, 2-132891

Int. Cl.[6] B41J *29/38*

U.S. Cl. 347—14 **17 Claims**



1. An information recording apparatus having:

recording means for recording information on a recording medium having a front surface, on the basis of recording information data, said recording means effecting recording by discharging a liquid for recording onto said recording medium;

conveying means for conveying said recording medium with the front surface thereof opposed to said recording means so that said recording means records information on the front surface of the recording medium;

photodetection speed detecting means for photodetecting light from a back side of the front surface of the recording medium to detect a conveyance speed condition of the recording medium, said photodetection speed detecting means including a light source for generating said light and a detector for photodetecting said light, said light source and said detector being arranged in the back side of the front surface of the recording medium, a position where the conveyance speed is detected by said photodetection speed detecting means being located at substantially a back side of a position where said recording means discharges said liquid onto said recording medium; and

control means for adjusting a recording position on the basis of conveyance speed information detected by said speed detecting means.

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5,589,859

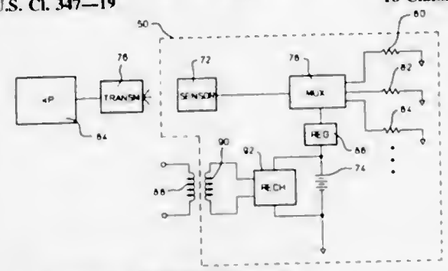
INKJET PRINTHEAD ELECTRICAL CONNECTIONS

Christopher A. Schantz, 939 Shell Blvd. #205, Foster City, Calif. 94404

Continuation of Ser. No. 419,970, Apr. 7, 1995, abandoned, which is a continuation of Ser. No. 113,161, Aug. 27, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,657

Int. Cl.[6] B41J *2/32*

U.S. Cl. 347—19 **16 Claims**



8. A scanning head printer comprising:

a stationary base, having a shaft;

a displaceable assembly, slidably engaging said shaft, having a reciprocating head means for printing on a sheet of material, said reciprocating head means including an array of inkjet nozzles in fluid communication with a supply of ink and operatively associated with a plurality of resistors that heat sufficiently to cause at least one drop of ink to eject from a nozzle;

transmitter means for irradiating drive signals, said transmitter means being fixedly mounted to said stationary base;

wireless reception means, fixedly attached to said displaceable assembly, for receiving said drive signals irradiated by said transmitter means; and

means, operatively coupled to said displaceable assembly, for selectively displacing said displaceable assembly along a linear print path;

wherein said drive signal are transmitted from said transmitter means to said reception means in a wireless fashion and said head means releases ink from said supply of ink in response to said drive signals.

5,589,860

INK JET RECORDING HEAD AND METHOD OF PRODUCING THE SAME

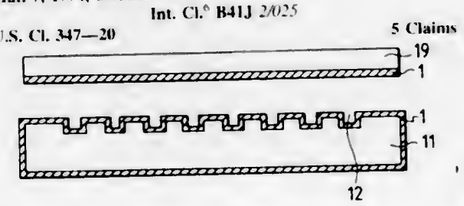
Yoshinobu Sugata; Mikio Yamazaki, and Takashi Umegaki, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1994, Ser. No. 288,056

Claims priority, application Japan, Aug. 11, 1993, 5-198691; Mar. 7, 1994, 6-035128

Int. Cl.[6] B41J *2/025*

U.S. Cl. 347—20 **5 Claims**



1. An ink jet recording head comprising:

a cavity plate;

vibrating plate; and

a plastic layer through which said cavity plate and said vibrating plate are joined, said plastic layer having a melting temperature which is lower than heat deformation temperatures of said cavity plate and said vibrating plate;

wherein said cavity plate and said vibrating plate are made of polyether imide resin, and said plastic layer is made of a resin selected from a group consisting of polysulfone resin, polyarylate resin, polyester resin, high heat-resistant polycarbonate resin, and polyphenylene ether resin.

5,589,861

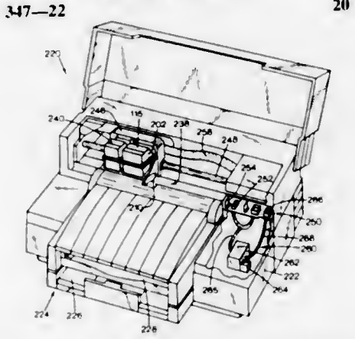
CLEANER CARTRIDGE FOR AN INKJET PRINTING MECHANISM

Alan Shibata, Camas, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 31, 1994, Ser. No. 250,899

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—22 **20 Claims**



1. A cleaning cartridge for servicing an inkjet printing mechanism having a solvent dispensing system and a pen carriage, comprising:

a body configured to be removably received in the pen carriage; and

an apparatus housed in the body and configured to perform a maintenance task on one or more components of the inkjet printing mechanism, wherein the apparatus includes a reservoir, a fluid contained within the reservoir, and a conduit that fluidically couples the reservoir to an exterior surface of the body, with the apparatus further including a metering device that controls fluid flow from the reservoir, and wherein the fluid comprises a fluid selected to reduce static charge accumulation on components of the inkjet printing mechanism.

5,589,862

LIQUID STORING CONTAINER FOR RECORDING APPARATUS

Toshihiko Ujita, Yamato; Koji Yamakawa; Masanori Takenouchi, both of Yokohama; Sadayuki Sugama, Tsukuba; Kenjiro Watanabe, Tokyo; Torachika Osada; Kazuhiro Nakajima, both of Yokohama; Takayoshi Tsutsumi, Takaramachi; Hidemi Kubota, Komae; Yasuo Kotaki, Yokohama; Keiichiro Tsukuda, Kawasaki, and Yohei Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

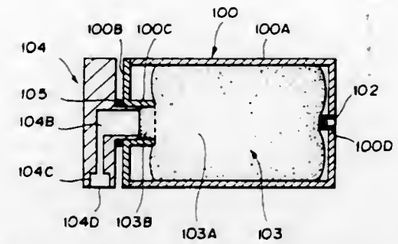
Division of Ser. No. 98,872, Jul. 29, 1993, abandoned. This application May 19, 1995, Ser. No. 444,545

Claims priority, application Japan, Jul. 31, 1992, 4-205106; Aug. 31, 1992, 4-230797; Aug. 31, 1992, 4-231788; Oct. 20, 1992, 4-281867; Nov. 2, 1992, 4-294309; Jan. 19, 1993, 5-006931; Jan. 19, 1993, 5-006933; Feb. 18, 1993, 5-029429

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—87 **8 Claims**

1. An ink container comprising a housing having a first opening portion formed of a cylindrical member projecting inward from said housing and a second opening portion formed thereon, and an ink absorbing member for storing ink provided in said housing inclusive of said first opening portion, said ink absorbing member



having a variable capillary power, said first opening portion to be connected to an ink discharging section, and said second opening portion communicating with the outside when said first opening portion is connected to said ink discharging section, wherein

when said ink container is connected to said ink discharging section, the power relationship between a capillary power Ka arising in said ink absorbing member located in said first opening portion and a capillary power Kb arising in said ink absorbing member in the region located adjacent to said first opening portion is represented by the following inequality,

$Ka_1 \geqq Kb$, subscript 1 indicating a capillary power at the time of connection,

said capillary power Ka, after said first opening portion is disconnected from said ink discharging section, varies as represented by the following inequality,

$Ka_1 \geqq Ka_2$, subscript 2 indicating a capillary power,

and at the time of disconnection, the power relationship between said capillary power Ka and said capillary power Kb is represented by the following inequality,

$Ka_2 < Kb$.

5,589,863

INK JET DROPLET GENERATOR

Richard W. Janse Van Rensburg, and Peter R. Keep, both of Cambridge, United Kingdom, assignors to Videojet Systems International, Inc., Hertfordshire, United Kingdom

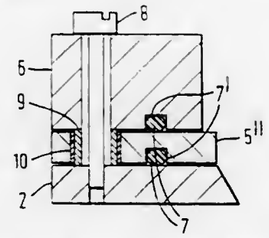
PCT No. PCT/GB94/00348, § 371 Date Dec. 20, 1994, § 102(e) Date Dec. 20, 1994, PCT Pub. No. WO94/19195, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 22, 1994, Ser. No. 325,325

Claims priority, application United Kingdom, Feb. 24, 1993, 9303703

Int. Cl.[6] B41J *2/02*

U.S. Cl. 347—75 **21 Claims**



1. An ink jet droplet generator comprising a print head structure, a cavity for ink, an ink nozzle carrier spaced from the print head structure, a cavity sidewall element providing a sidewall for the cavity between the print head structure and the nozzle carrier further comprising: coupling means for acting as a spacer to set the distance between the print head structure and the nozzle carrier, said means being taller than the sidewall element so that only said coupling means makes contact between said print head structure and said nozzle carrier, the total contact area provided by said coupling means being smaller than the area of the facing surfaces of the sidewall element and each of said nozzle carrier and print head structure.

5,589,864

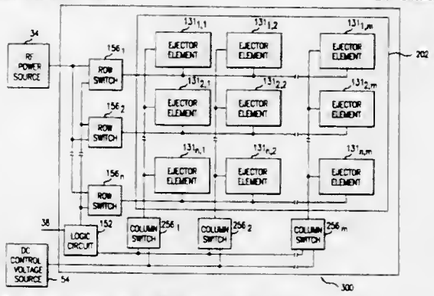
INTEGRATED VARACTOR SWITCHES FOR ACOUSTIC INK PRINTING

Babur B. Hadimioglu, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1994, Ser. No. 316,141

Int. Cl.[6] B41J *2/07;* **H02J** *1/00*

U.S. Cl. 347—46 **20 Claims**



8. An acoustic ink jet ejector, comprising:

a silicon substrate having a first surface;

an integrated varactor and piezoelectric device located on the first surface of the silicon substrate, the silicon substrate being a first electrode, the integrated varactor and piezoelectric device having a second electrode and a third electrode;

an RF power source connected across the first electrode and the third electrode;

control signal means for turning on and off the integrated varactor and piezoelectric device by switching a voltage across the first and second electrodes to high and low voltage levels, respectively; and

an acoustic lens located on a second surface of the silicon substrate generally aligned with the integrated varactor and piezoelectric device along an axis perpendicular to the first and second surfaces of the silicon substrate.

5,589,865

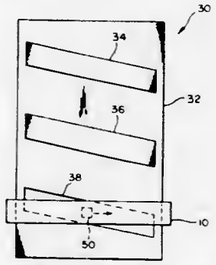
INKJET PAGE-WIDE-ARRAY PRINTHEAD CLEANING METHOD AND APPARATUS

Robert R. Beeson, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 14, 1994, Ser. No. 356,592

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—28 **7 Claims**



1. A media sheet for feeding along a print media path of a page-wide array inkjet printer to clean printhead nozzles, comprising:

a backing sheet;

a first pad located on the backing sheet having an ink solvent for cleaning ink;

a second pad located on the backing sheet for absorbing ink and solvent; and

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wherein solvent from the first pad comes into contact with printhead nozzles while passing the backing sheet through a paper path of the printer; and

wherein absorbing material of the second pad comes into contact with printhead nozzles to remove ink and solvent from the nozzles while passing the backing sheet through the paper path of the printer; and

wherein an opening is defined in the backing sheet for encountering less than all nozzles of the page-wide-array printhead during a cleaning operation while the opening is positioned adjacent to a printhead nozzle the opening defining a scanning path along which a cleaning apparatus contacts the printhead as the backing sheet passes through the paper path of the printer.

5,589,866

AIR EVACUATION SYSTEM FOR INK-JET PRINTER

Todd L. Russell, Camas, Wash.; Brent W. Richtsmeier, San Diego, and Kevin L. Glassett, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 171,129, Dec. 20, 1993, Pat. No. 5,446,487, which is a continuation of Ser. No. 876,939, May 1, 1992, Pat. No. 5,296,873. This application Jan. 13, 1995, Ser. No. 372,541

Int. Cl.[6] B41J *2/01;29/377*

U.S. Cl. 347—102 **28 Claims**

1. An ink-jet printer, comprising:

a printhead for ink-jet printing on a print medium disposed at a print zone, said printhead being supported by a printhead carriage for movement relative to a printer body;

means for advancing the print medium to said print zone during print operations; and

ink vapor removal means for removing ink carrier vapors emanating from said printhead and ink deposited on said print medium away from said print zone, said ink vapor removal means comprising a duct having an elongated inlet opening disposed along an extent of said print zone, said duct and inlet opening fixed in position relative to said printer body, and means for transporting said ink vapors into said duct and away from said print zone.

5,589,867

METHOD AND APPARATUS FOR FORMING AN IMAGE ON A RECORDING MEDIUM

Chiseki Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

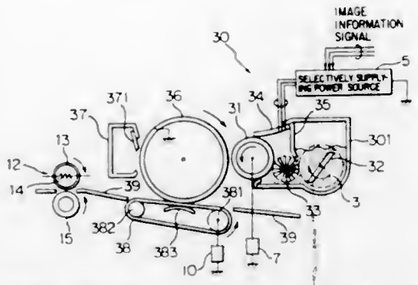
Filed Jun. 23, 1994, Ser. No. 264,525

Claims priority, application Japan, Jun. 23, 1993, 5-150958

Int. Cl.[6] G01D *15/06*

U.S. Cl. 347—141 **25 Claims**

1. A method for forming an image on a recording medium comprising the steps of: supplying toner injected with static charge onto a toner carrier to form a toner pattern transferring the toner pattern from the toner carrier to a conveying member by applying an electric field directing the static charge toward the conveying member; transcribing the toner pattern from the conveying member onto a recording medium; and fixing the toner pattern onto the recording medium, wherein said step of supplying toner onto the toner carrier to form the toner pattern is effected by a toner supply control member having one end disposed in abutment with the toner carrier, said toner supply control member being supplied with



a voltage corresponding to an image information signal to control the supply of toner and formation of the toner pattern on the toner carrier.

5,589,868

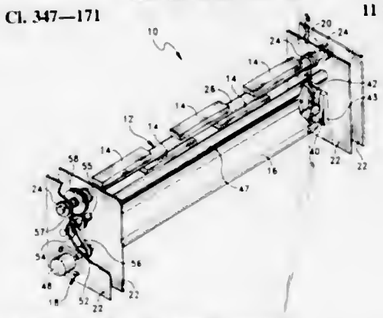
MULTI-HEAD WIDE-FORMAT THERMAL PLOTTER

Harry Schofield, Narragansett; Paul Caron, Tiverton; Gary Field, Portsmouth, and Paul Follett, Wakefield, all of R.I., assignors to Atlantek Inc., Wakefield, R.I.

Filed Feb. 21, 1995, Ser. No. 391,048

Int. Cl.[6] B41J *2/32*

U.S. Cl. 347—171 **11 Claims**



4. A thermal printing apparatus comprising:

a single platen roller;

a plurality of thermal print heads arranged in upper and lower diametrically opposed rows on said single platen roller, said print heads each including a print line, said print heads being arranged such that said print lines are aligned in a common vertical plane, each of said print heads engaging said single platen roller with a predetermined engagement pressure;

a continuous web of print media sequentially threaded through said first and second rows of print heads, said print heads being further arranged in alternating relation between said rows such that print lines of thermal print heads in alternate rows abut each other with respect to a width of said print media;

means for providing a back tension force on said continuous web of print media; and

drive means for directly driving rotation of said platen roller wherein said first and second rows of print heads cooperate with said single platen roller to form upper and lower drawing nips directly on the surface of said single platen roller and further wherein a combined engagement pressure of said print heads in said first and second rows cooperates with said single platen roller to provide a sufficient drawing force to overcome said media back tension force and draw said print media through said first and second rows of print heads, said engagement pressure of said print heads in said first row providing insufficient drawing force to overcome said back tension force.

5,589,869

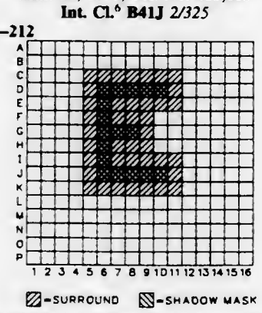
SYSTEMS AND METHODS FOR THERMAL TRANSFER PRINTING

Thomas J. Brandt, Canby, and Stephen A. Zimmerman, Wilsonville, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Division of Ser. No. 962,367, Oct. 16, 1992, Pat. No. 5,512,930, which is a continuation-in-part of Ser. No. 930,572, Aug. 17, 1992, Pat. No. 5,546,114, which is a continuation-in-part of Ser. No. 762,537, Sep. 18, 1991, abandoned. This application Mar. 31, 1995, Ser. No. 415,003

Int. Cl.[6] B41J *2/325*

U.S. Cl. 347—212 **16 Claims**



1. A method of printing to form a predetermined printed image on a substrate, comprising the steps of:

(a) determining a first area on said substrate where a colorant is to be deposited to form said predetermined printed image;

(b) determining a second area which is immediately adjacent to said first area;

(c) depositing said colorant over said first area to create said predetermined printed image; and

(d) depositing an aftercoat over said first area and said second area for sealing said deposited colorant.

5,589,870

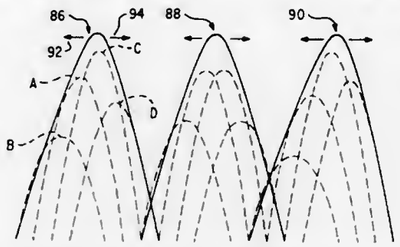
SPOT PROFILE CONTROL USING FRACTIONAL INTERLACE FACTORS IN A POLYGON ROS

Douglas N. Curry, Menlo Park, and David L. Hecht, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1994, Ser. No. 332,175

Int. Cl.[6] B41J *2/45;2/455;2/47*

U.S. Cl. 347—233 **28 Claims**



1. A fractional interlace scanning method for scanning a scan line across an image receiving member, the scan line formed by separately scanning a plurality of light beams across the image receiving member, the method comprising the steps of:

determining a shape of an envelope representative of a profile of the plurality of light beams to be separately scanned to form the scan line;

adjusting the shape of the envelope by changing a characteristic of one of the plurality of light beams; and

separately scanning the plurality of light beams corresponding to the adjusted shape of the envelope to form the scan line.

5,589,871

IMAGE FORMING APPARATUS WITH SAFETY SWITCH AND CURRENT DISSIPATING CONTROLLER

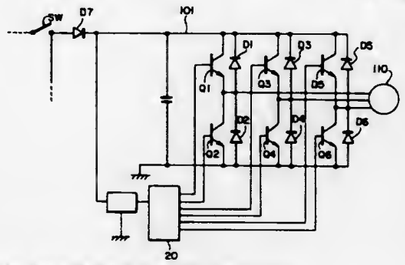
Mikiyuki Aoki, and Kunihiko Omura, both of Toyohashi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1994, Ser. No. 186,802

Claims priority, application Japan, Jan. 26, 1993, 5-011035

Int. Cl.[6] B41J *2/435*

U.S. Cl. 347—237 **16 Claims**



1. An image forming apparatus comprising:

a motor;

a power source for driving said motor, said motor capable of providing a regeneration current when said power source is disconnected;

a cover provided so as to be capable of opening and closing relative to a body of the apparatus;

a safety switch for switching an electrical connection and a disconnection between said motor and said power source in conjunction with the opening and closing operation of said cover; and

an interrupt member for interrupting an outflow of any regeneration current generated by said motor when said motor is disconnected from said power source by said safety switch.

5,589,872

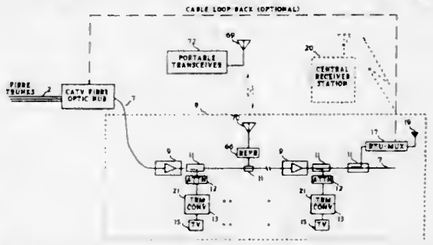
COMPATIBLE INTERACTIVE TV AND MULTIMEDIA DELIVERY SYSTEM TWO-WAY CABLE TV CONVERSION SYSTEM FOR DATA TRANSMISSION OVER A DEDICATED FREQUENCY BAND

Louis Martinez, Perris, Calif., assignor to Radio Telecom & Technology, Inc., Riverside, Calif.

Division of Ser. No. 207,386, Mar. 7, 1994, which is a continuation-in-part of Ser. No. 941,187, Sep. 4, 1992, Pat. No. 5,321,514, which is a division of Ser. No. 202,206, Jun. 3, 1988, Pat. No. 5,177,604, which is a division of Ser. No. 863,101, May 14, 1986, Pat. No. 4,750,036. This application Sep. 11, 1995, Ser. No. 526,787

Int. Cl.[6] H04N *7/14*

U.S. Cl. 348—12 **28 Claims**



1. In an interactive television system, a method for communicating information to at least one central receiver from at least one remote receiver location, each remote receiver location connected to a cable television system, the cable television system for transmitting at least one video signal in a downlink direction over at

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least one cable, the at least one cable having at least one amplifier along the at least one cable, each amplifier serving at least one remote location, the method comprising the steps of:

(i) at at least one remote location:

(a) modulating the information to be communicated from the at least one remote location onto a first carrier;

(b) transmitting the modulated first carrier of step (i)(a) onto the at least one cable only during at least some of the blanking intervals of a first cable channel;

(ii) after at least one cable amplifier in the downlink direction from the at least one remote location:

(a) detecting the modulated information received on the at least one cable and retransmitting the modulated information over the air on a second carrier in a dedicated frequency band.

5,589,873

MULTIPOINT TELEVISION CONFERENCE SYSTEM WITH A MULTIPOINT CONTROL UNIT FOR REGISTERING INFORMATION ABOUT TV CONFERENCE ROOMS AND ROOM GROUPS AND ALLOWING A SELECTED ROOM TO PARTICIPATE IN THE TV CONFERENCE BASED ON REGISTERED INFORMATION

Hiroaki Natori; Hitoshi Takei; Shoichi Sano, and Shoichi Tamuki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 30, 1995, Ser. No. 413,178

Claims priority, application Japan, Jul. 20, 1994, 6-167615

Int. Cl.[6] H04M *3/56*

U.S. Cl. 348—15 **8 Claims**

1. A multipoint television conference system for holding television conferences among television conference rooms (**20-1**, **20-2**, - - **20-n**) by using a multipoint control unit (**1**) connected with the television conference rooms through a communication network (**3**), said multipoint television conference system comprising:

registration means (**14**) provided in the multipoint control unit, for registering room names of the television conference rooms and group names of groups into which the television conference rooms are divided;

control means (**15**) provided in the multipoint control unit, for reading the room names of the television conference rooms not participating in the television conferences, from said registration means and transmitting the read room names to the television conference rooms requiring to hold the television conferences, and for reading the group names from said registration means and transmitting the read group names to the television conference rooms requesting to participate in the television conferences, and

operation means (**30**) provided in the television conference rooms respectively, for receiving and displaying the room names which are produced at said control means and transmitted from the multipoint control unit and selecting a designated room name from the displayed room names, and for receiving and displaying the group names which are produced at said control means and transmitted from the multipoint control unit and selecting a designated group name from the displayed group names.

5,589,874

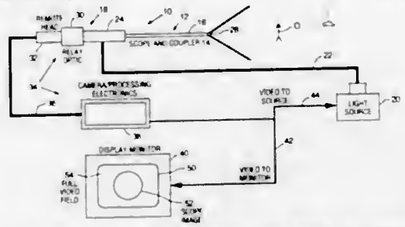
VIDEO IMAGING SYSTEM WITH EXTERNAL AREA PROCESSING OPTIMIZED FOR SMALL-DIAMETER ENDOSCOPES

Michael P. Buchin, Palo Alto, Calif., assignor to Origin Medsystems, Inc., Menlo Park, Calif.

Continuation of Ser. No. 74,110, Jun. 9, 1993, abandoned. This application May 4, 1995, Ser. No. 434,207

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—72 **15 Claims**



1. A method of deriving an output video signal by processing an input video signal generated by an image sensor on which an image of a fibre-optic imaging bundle is formed by an image-forming apparatus of which the fibre-optic imaging bundle is a part, the image of the fibre-optic imaging bundle being formed on only a part of the image sensor to mitigate pixellation artifacts resulting from the optical fibres of the fibre-optic imaging bundle, the method comprising steps of:

receiving the input video signal, the input video signal including plural frames, each of the frames having a frame structure, each of the frames including an image portion generated by the part of the image sensor on which the image of the fibre-optic imaging bundle is formed, and an external portion generated by the part of the image sensor on which the image is not formed;

automatically identifying the external portion of the input video signal;

synthesizing, in response to the identifying step, a synthesized external signal portion corresponding to the external portion of the input video signal; and

generating frames of the output video signal by replacing the external portion of each of the frames of the input video signal with the synthesized external signal portion synthesized in the synthesizing step to provide a respective one of the frames of the output video signal with the same frame structure as the frames of the input video signal, wherein, in the step of synthesizing a synthesized external signal portion, the synthesized external signal portion is synthesized to have a predetermined level.

5,589,875

TELEVISION CAMERA HAVING VARIABLE LENS IRIS/SHUTTER BASED ON POSITION/ROTATIONAL SPEED OF CAMERA

Shigeru Fujita, and Toshio Sakai, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 891,050, Jun. 1, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 344,703

Claims priority, application Japan, Jun. 17, 1991, 3-144479; Apr. 10, 1992, 4-090528

Int. Cl.[6] H04N *7/18; 9/47*

U.S. Cl. 348—143 **12 Claims**

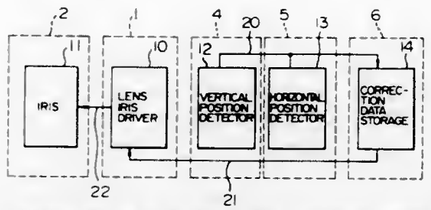
1. A television camera device comprising:

an image pickup camera moveable in at least one direction and including a lens iris and means for (i) adjusting said lens iris automatically in accordance with a quantity of incoming light from a scene, including an object and a background, being imaged to achieve an adjusted lens iris and (ii) correcting the adjusted lens iris in accordance with a correction datum to image said object while reducing influences of light from the background;

means for moving said camera to image said object;

detecting means for detecting a position of said camera in said at least one direction and outputting a position signal indicating said position; and

storing means, receiving said position signal, for storing correction data to correct the adjusted lens iris, said correction data being predetermined and including a plurality of data portions corresponding to a plurality of possible positions of said camera, said storing means outputting one of said plurality of data portions to said camera as said correction datum in response to said position signal, thereby enabling production of a clearer image of said object.



5,589,876

INFRARED IMAGING DEVICE READILY REMOVING OPTICAL SYSTEM CONTRIBUTORY COMPONENT

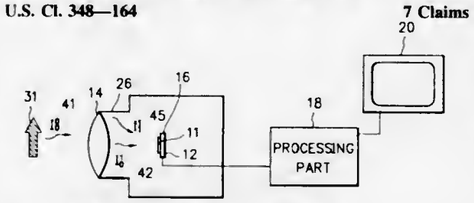
Kazuo Konuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1994, Ser. No. 308,932

Claims priority, application Japan, Sep. 28, 1993, 5-240981

Int. Cl.[6] H04N *5/217;* **H01L** *25/00*

U.S. Cl. 348—164 **7 Claims**



1. An infrared imaging device, comprising:

an optical system including an infrared lens;

an infrared solid state image sensing device for detecting a light radiated from an object, focused by the optical system, the infrared solid state image sensing device having an image area where first infrared detectors for detecting infrared image signals are arranged in a two-dimensional array form;

infrared detecting means being arranged on the infrared solid state image sensing device outside the image area and comprising infrared detector groups for extracting an optical system contributory component, the infrared detector groups including at least two kinds of second infrared detectors having respectively different sensitivity characteristics to obtain at least two kinds of output signals; and

processing means for carrying out a calculation processing of the infrared image signals output from the first infrared detectors within the image area on the basis of basic data previously prepared as characteristics of said at least two kinds of the output signals obtained by the second infrared detectors of the infrared detecting means, so as to remove the optical system contributory component.

5,589,877

AUTOMATIC AMPLITUDE CONTROL CIRCUIT FOR A VECTOR SCOPE

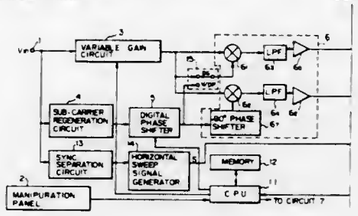
Kenzo Ikuzawa, and Yoshimichi Hika, both of Kanagawa-ken, Japan, assignors to Leader Electronics Corporation, Kanagawa-ken, Japan

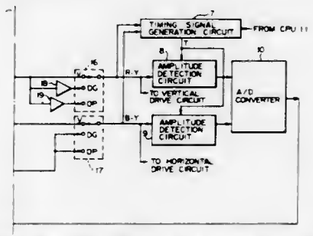
Filed May 17, 1995, Ser. No. 443,168

Claims priority, application Japan, May 17, 1994, 6-102918

Int. Cl.[6] H04N *17/02*

U.S. Cl. 348—186 **16 Claims**





1. A signal processing circuit for a vector scope adapted to display and measure characteristics of a color video signal on a screen therein comprising:

(a) variable gain means for varying a gain of said color video signal input to the signal processing circuit;

(b) chrominance signal generation means, in response to a signal output from said variable gain means, for detecting and generating first and second chrominance signals;

(c) first detection means, in response to said first and second chrominance signals, for detecting an amplitude of a burst signal contained in the color video signal;

(d) first memory means for previously storing a reference amplitude of said burst signal; and

(e) gain adjusting means for comparing the amplitude of said burst signal detected by said first detection means with said reference amplitude stored in said first memory means and adjusting the gain at said variable gain means so that they coincide with each other.

5,589,878

METHOD OF DETERMINING AN ERROR IN A VIDEO CONFERENCING SYSTEM CAMERA

Leo M. Cortjens, Norcross; Kenneth A. Franklin, Lawrenceville; Richard C. Mays, Atlanta, and Curtis M. Smith, Lawrenceville, all of Ga., assignors to Videoconferencing Systems, Inc., Norcross, Ga.

Division of Ser. No. 139,645, Oct. 20, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,412

Int. Cl.[6] H04N *5/232*

U.S. Cl. 348—211 **27 Claims**

1. A videoconferencing system with error detection, comprising:

a camera for providing a picture, said camera including a zoom mechanism and a focus mechanism;

a pan and tilt mechanism for pointing said camera to a desired position;

a zoom position indicator tier providing a zoom status signal;

a focus position indicator for providing a focus status signal;

a pan position indicator for providing a pan status signal;

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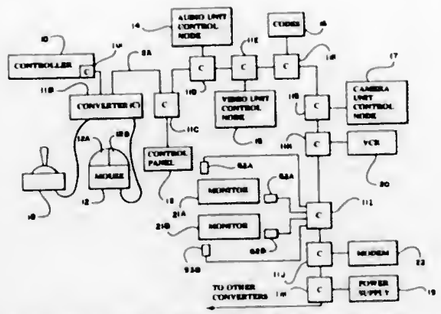


a tilt position indicator for providing a tilt status signal;

a monitor for displaying said picture;

means for providing zoom and focus commands to said camera, for providing pan and tilt commands to said pan and tilt mechanism, for monitoring said zoom status signal, said focus status signal, said pan status signal, and said tilt status signal to determine whether said commands were properly executed, for determining that an error has occurred if any of said commands were not properly executed, for providing an error detection signal if a said error has occurred and for maintaining a record of said error and an indication of the command associated with said error.

5,589,879

PERFORMING WHITE BALANCE CORRECTION ON INTEGRATED DIVIDED AREAS OF WHICH AVERAGE COLOR IS SUBSTANTIALLY WHITE

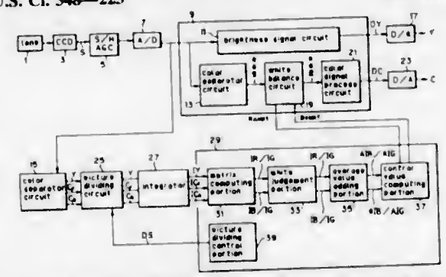
Kenji Saito, and Yasuhiro Shinkai, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1994, Ser. No. 216,850

Claims priority, application Japan, Mar. 26, 1993, 5-067715; Mar. 30, 1993, 5-071290; Mar. 31, 1993, 5-074257

Int. Cl.[6] H04N *9/73*

U.S. Cl. 348—223 **14 Claims**



1. An automatic white balance control device comprising:

picture dividing means, receiving a photograph signal corresponding to a photograph condition, for dividing a picture image into a plurality of areas and periodically receiving picture signals with respect to one of the plurality of areas for one field in numerical order;

integrating means for integrating picture signals output from said picture dividing means and outputting integrated values for every one field;

control means for judging whether an average color of said picture signals within each of said areas outputting said picture signals is substantially white, outputting white balance control signals in accordance with said integrated values when said average color is judged as substantially white and outputting to said picture dividing means a command representing a number of divided areas for which said picture image is to be divided and

a white balance circuit for controlling white balance by adjusting levels of elementary color signals in accordance with said white balance control signals,

wherein said control means groups said divided areas into a plurality of groups according to predetermined patterns corresponding to each different group, adjacent divided areas are grouped into different groups from each other, signals are alternatively output from each of said groups in accordance with said command.

5,589,880

TELEVISION CAMERA USING TWO IMAGE PICKUP DEVICES WITH DIFFERENT SENSITIVITY

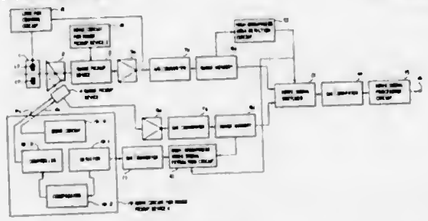
Akimi Tsukui, Higashikurume, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,708

Claims priority, application Japan, Jan. 25, 1994, 6-006202

Int. Cl.[6] H04N *5/235*

U.S. Cl. 348—229 **17 Claims**



1. A television camera comprising:

a lens system having an iris structure for receiving incident light from an object;

a spectrometer for dispersing an optical image of said object from said lens system and producing first and second optical images, said spectrometer splitting light quantity of the optical image of said object from said, lens system and assigning the split light quantities to said first and second optical images in a predetermined ratio;

first and second image pickup devices, on which the first and second optical images from said spectrometer are focused, for converting said first and second optical images into video signals, respectively;

first and second amplifiers for amplifying the video signals from said first and second image pickup devices, respectively;

a high-brightness signal detection circuit for detecting whether or not the video signal supplied from said first amplifier is a high-brightness signal indicating that said video signal from said first amplifier has a level equal to or higher than a predetermined level which is lower than a saturated output signal level of said first image pickup device, and for outputting a detection signal indicating the high-brightness signal during a period where the video signal from said first amplifier is detected to have a level equal to or higher than said predetermined level;

a video signal switcher for selecting and outputting one of said video signals from said first and second amplifiers in accordance with said detection signal;

a signal processing circuit for converting the video signal from said video signal switcher into a composite video signal and outputting said composite video signal as an output composite video signal of said television camera;

an iris control circuit for controlling an opening of said iris structure of said lens system in accordance with the video signal from said first amplifier;

a high-brightness video signal extraction circuit for gating the video signal from said second amplifier in accordance with

said detection signal and extracting the gated video signal of said video signal from said second amplifier corresponding to said high-brightness signal out of the video signal output from said second amplifier; and

an image pickup device control circuit for controlling a charge storage time of said second image pickup device in accordance with a level of the video signal extracted by said high-brightness video signal extraction circuit.

5,589,881

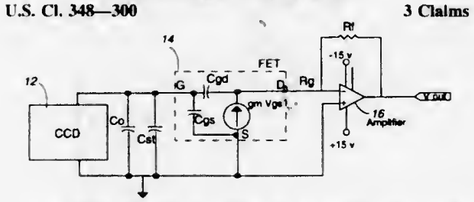
ENHANCED PERFORMANCE CCD OUTPUT AMPLIFIER

Mark E. Dunham, Los Alamos, and David W. Morley, Santa Fe, both of N.M., assignors to The Regents of the Univ. of California Office of Technology Transfer, Alameda, Calif.

Filed Nov. 9, 1994, Ser. No. 337,692

Int. Cl.[6] H04N *5/335;* **H03F** *3/16*

U.S. Cl. 348—300 **3 Claims**



1. An output amplifier for amplifying an output charge signal from a CCD comprising:

A FET having a gate connected to said CCD for receiving said output charge signal from said CCD and outputting an intermediate signal from a drain of said FET where said FET has a gate-to-source shunt capacitance at least equal to the sum of CCD shunt capacitance, circuit stray capacitance, and gate-to-drain capacitance, the remaining capacitances seen at the output node of said CCD; and

an intermediate amplifier connected to said drain of said FET for receiving said intermediate signal and outputting a low-noise signal.

5,589,882

INTEGRAL INFRARED ABSORBING OPTICAL LOW-PASS FILTER

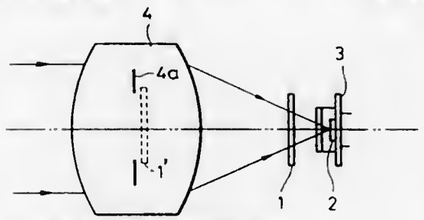
Akihiko Shiraishi; Kazuo Fujibayashi, both of Kawasaki, and Tetsun Kuwabara, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 539,175, Jun. 18, 1990, abandoned. This application May 31, 1995, Ser. No. 455,250

Claims priority, application Japan, Jun. 20, 1989, 1-157031

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—340 **10 Claims**



1. An optical low-pass filter comprising:

a single optical member formed of a material having a property of absorbing infrared light in a predetermined wavelength range, said optical member having a plurality of ridge-like portions formed on at least one surface therenf at a predetermined pitch, said ridge-like portions comprising a phase type diffraction grating, said diffraction grating having a low-pass filtering effect with respect to bundles of optical transmission rays to prevent production of pseudo-colors.

5,589,883

CATHODE RAY TUBE DISPLAY

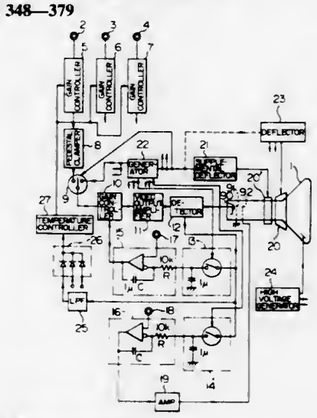
Masanori Ogino; Takeo Yamada; Miyuki Ikeda, all of Yokohama; Tsuneo Fujikura, Chigasaki; Takahiko Fujiwara, Yokohama, and Etsuhiro Nakagiri, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 813,082, Dec. 24, 1991, abandoned. This application Jun. 8, 1994, Ser. No. 257,441

Claims priority, application Japan, Dec. 26, 1990, 2-417590

Int. Cl.[6] H04N *5/68*

U.S. Cl. 348—379 **9 Claims**



1. A display system comprising:

at least one cathode ray tube, said at least one cathode ray tube having three cathode electrodes;

first video amplifiers for amplifying three video signals;

second video amplifiers for outputting three amplified video signals to said three cathode electrodes of said at least one cathode ray tube;

black reference insertion means for inserting a black level reference signal into a part of a vertical blanking period of the three video signals;

cathode current detection means coupling the outputs of said second video amplifiers to said three cathode electrodes, for independently detecting each of three cathode beam currents of said at least one cathode ray tube;

black reference sampling means coupled to said cathode current detection means, for sampling and holding each of three black level cathode beam currents outputted from said cathode current detection means and corresponding to the black level reference signal; and

black level control means responsive to said black reference sampling means for automatically and independently controlling each of three optical black levels of said at least one cathode ray tube by adjusting at least one second-grid voltage of said at least one cathode ray tube, thereby correcting a change in a cut-off voltage of said at least one cathode ray tube and at the same time correcting a change in perveance of said at least one cathode ray tube,

wherein said cathode current detection means comprises a voltage follower having an output connected to one of said three cathode electrodes of said at least one cathode ray tube and an input connected to receive one of the three amplified video output signals from said second video amplifiers, and a capacitor coupling said output and said input of said voltage follower, so that an output current of said voltage follower is detected through a current return path.

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5,589,884

ADAPTIVE QUANTIZATION CONTROLLED BY SCENE CHANGE DETECTION

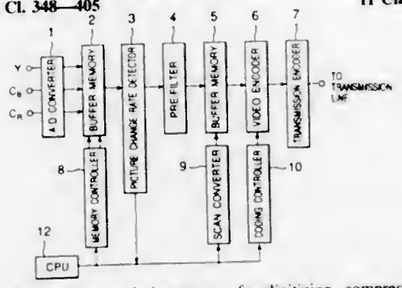
Yuji Ohguchi, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo-to, Japan

Filed Sep. 30, 1994, Ser. No. 316,348

Claims priority, application Japan, Oct. 1, 1993, 5-269525

Int. Cl.[6] H04N *7/32*

U.S. Cl. 348—405 **11 Claims**



1. A picture transmission system for digitizing, compression-encoding and transmitting a picture signal consisting of luminance signal and chrominance signals the system comprising:

a buffer memory storing a picture signal of a newest frame, output from the buffer memory including a luminance signal and chrominance signals which are characteristic of the stored picture signal;

a frame memory storing a picture signal of a most recent former frame delivered from the buffer memory;

a subtracter determining differences between corresponding pixels represented by the picture signal of the newest frame inputted from the buffer memory and the picture signal of the most recent former frame read out from the frame memory;

a numeric value converter comparing the differences between the corresponding pixels with a predetermined threshold value;

a calculating device calculating a number of differences exceeding the predetermined threshold value;

a processor calculating a picture change rate for the newest frame based on the number of differences calculated by the calculating device, and calculating a difference between a plurality of picture change rates including the newest picture change rate; and

a coding controller for generating a control signal based on the difference calculated by the processor, the control signal being generated in accordance with a predetermined function to control a quantization level of a video encoder.

5,589,885

MOVING PICTURE CODING AND DECODING CIRCUIT

Yasushi Ooi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 32,300, Mar. 17, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,499

Claims priority, application Japan, Mar. 17, 1992, 4-058697

Int. Cl.[6] H04N *7/32*

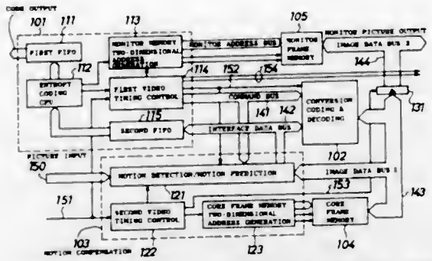
U.S. Cl. 348—416 **4 Claims**

1. A moving picture coding and decoding circuit capable of coding each of picture frames of a moving picture based on one of three predictive coding methods for an intra-frame coded picture, a predictive coded picture and a bidirectional predictive coded picture, comprising:

first processing means for executing motion detection and motion prediction of a moving picture and outputting a picture predictive difference signal and a picture predictive signal;

core frame memory means for storing therein picture frame data necessary for execution of one of said predictive coding methods;

second processing means including an orthogonal transformation section, a quantization section, a dequantization section



and an inverse orthogonal transformation section for executing conversion coding with said picture predictive difference signal to output a conversion coefficient and adding said picture predictive signal to said picture predictive difference signal to output a picture decoding result;

said second processing means further including a video timing control section for selecting processes by said orthogonal transformation section, said quantization section and said inverse orthogonal transformation section and a data transfer process between said first, second and third processing means and for controlling start times of said processes;

monitor frame memory means for storing therein picture frame data with which said picture decoding result is to be monitored;

third processing means for executing entropy coding based on said conversion coefficient and outputting bit variable length code data as a result of said entropy coding;

a first data bus for coupling said core frame memory means and said first and second processing means to each other;

a second data bus coupled to said monitor frame memory means; and

bus buffer means for coupling said first and second data buses;

said first processing means including a two-dimensional address generation section for generating an address for said core frame memory means;

said third processing means including a two-dimensional address generation section for generating an address for said monitor frame memory means.

5,589,886

MULTISTANDARD DECODER FOR DATA STORED IN THE VERTICAL BLANKING INTERVAL OF A VIDEO SIGNAL

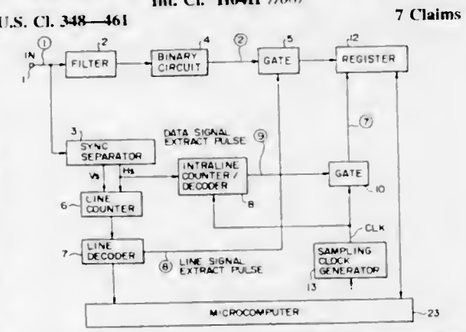
Tadashi Ezaki, Tokyo, Japan, assignor to Sony Corporation

Division of Ser. No. 130,469, Oct. 1, 1993, Pat. No. 5,453,794. This application May 3, 1995, Ser. No. 434,062

Claims priority, application Japan, Oct. 8, 1992, 4-293982

Int. Cl.[6] H04H *7/087*

U.S. Cl. 348—461 **7 Claims**



1. A data decoding device for selectively or simultaneously decoding data of plural formats superimposed at predetermined positions in a vertical blanking period of a video signal, said device comprising:

extract pulse generator means for detecting a line number and an intraline position in the vertical blanking period from a vertical sync signal and a horizontal sync signal of a composite video signal, and generating a line signal extract pulse and a data signal extract pulse;

binary circuit means for converting the video signal into a binary signal;

data sampling clock generator means for generating a data sampling clock signal having a frequency at least twice that of a highest clock signal frequency of the data of plural formats;

memory means supplied with the data sampling clock signal and the binary signal in response to the line signal extract pulse and the data signal extract pulse, and storing a data signal therein from the binary signal in accordance with the data sampling clock signal; and

determining means for determining a kind of said data signal from the line number and also from a signal format of said data signal stored in said memory means.

5,589,887

METHOD AND CIRCUIT FOR DETECTING AND CONCEALING VIDEO SIGNAL ERRORS

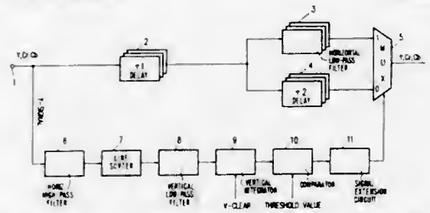
Gerhard Wischermann, Weiterstadt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 11, 1995, Ser. No. 526,808

Claims priority, application Germany, Sep. 15, 1994, 44 32 787.0

Int. Cl.[6] H04N *5/21*

U.S. Cl. 348—616 **12 Claims**



1. A method of detecting and concealing video signal errors caused by vertically extending film scratches during television film scanning, said method comprising the steps:

deriving an error signal at error locations generated by disturbed pixels; and

concealing the errors in the video signal using said error signal to form a control signal, characterized in that said deriving step comprises:

generating the error signal only when an adjustable, locally bounded scratch width in the horizontal direction is not exceeded and when each scratch essentially extends vertically, and when the scratch length substantially corresponds to the film frame height, and said concealing step comprises:

replacing the disturbed locations in the video signal with a corresponding low-pass-filtered video signal with the aid of the error signal.

5,589,888

YC SEPARATION AND STILL PICTURE REPRODUCING CIRCUIT

Kiyoshi Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 20, 1995, Ser. No. 504,503

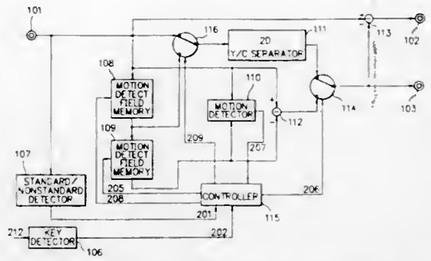
Claims priority, application Japan, Jul. 22, 1994, 6-170934

Int. Cl.[6] H04N *9/78*

U.S. Cl. 348—669 **20 Claims**

1. A video signal processor comprising:

2D Y/C separation means for performing a 2D Y/C separation between scanning lines for a video signal received as input;



a first field memory having an input for receiving the video signal and an output;

a second field memory having an input for receiving the output from the first field memory and an output;

3D Y/C separation means for performing an interframe 3D Y/C separation using said video signal and the output from the second field memory;

standard/nonstandard detection means for detecting whether said video signal is a standard signal or a nonstandard signal;

motion detection means for detecting a motion of a picture by comparing said video signal with a previous frame of said video signal;

first switching means for switching between an output of the 2D Y/C separation means and an output of the 3D Y/C separation means depending on an output of the standard/nonstandard detection means and an output of the motion detection means; and

second switching means for connecting said output of the first field memory to the 2D Y/C separation means when a function employing a field memory is requested.

5,589,889

IMAGE MEMORY DEVICE AND METHOD OF OPERATING SAME

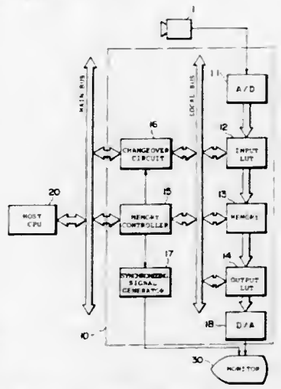
Yoshiki Kawaoka, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 868,208, Apr. 14, 1992, abandoned. This application Apr. 29, 1994, Ser. No. 235,221

Claims priority, application Japan, Apr. 16, 1991, 3-109620

Int. Cl.[6] H04N *5/202*

U.S. Cl. 348—674 **4 Claims**



1. An image memory device comprising:

A/D converting means for converting an analog video signal from a video camera, into digital video image data;

input reverse-gamma correcting means having a rewritable input look-up table with data stored therein for applying a reverse gamma-correction to the digital video image data, which is

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provided by said A/D converting means, in order to convert, into linear characteristics, non-linear incident-light luminance vs. output-signal characteristics of said video camera, a reverse gamma correction being applied to the digital video image data using the data of said input look-up table with said reverse gamma correction being bound to the characteristics of said video camera;

memory means for storing the digital video image data corrected by said input reverse-gamma correcting means to always possess linearity;

output gamma correcting means having a rewritable output look-up table with data stored therein for applying a gamma correction to the digital video image data, which is read out of said memory means, in order to make the linear characteristics conform to non-linear input signal vs. output-light luminance characteristics of a display device, the gamma correction being applied to the digital video image data, which is read out of said memory means, using the data of said output look-up table with said gamma correction being related only to the characteristics of said display device; and

D/A converting means for converting the digital video image data, which has been corrected by said output gamma correcting means, into an analog video signal in order to be applied to said display device.

5,589,890

FILTER ARCHITECTURE, PARTICULARLY FOR VIDEO APPLICATIONS

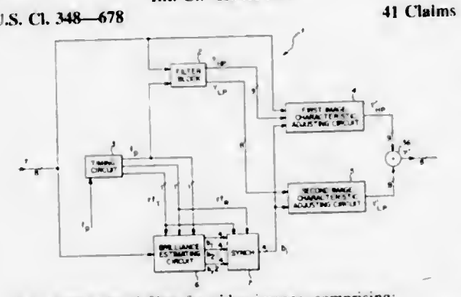
Massimo Mancuso, Favara; Rinaldo Poluzzi, Milan, and Gianguido Rizzotto, Civate, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, and Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, both of Italy

Filed Sep. 29, 1994, Ser. No. 314,862

Claims priority, application European Pat. Off., Sep. 30, 1993, 93830402

Int. Cl.[6] H04H *5/52*

U.S. Cl. 348—678 **41 Claims**



1. A digital signal filter for video images, comprising:

a timing circuit having first, second, and third outputs for providing synchronism command signals;

a filter circuit having a first input coupled to an input of the digital signal filter, and a second input coupled to the first output of the timing circuit, said filter circuit including means for separating from an input signal high frequency components and low frequency components and for generating first and second outputs for the high and low frequency components, respectively;

a brilliance estimation circuit having a first input coupled to said input of the digital signal filter, and at least second, third, and fourth inputs respectively coupled to the first, second, and third outputs of the timing circuit, said brilliance estimation circuit having means for measuring and memorizing brilliance values associated with at least one image section;

a first image characteristic adjusting circuit for a first image characteristic, operated using fuzzy logic, having a first input coupled to said input of the digital signal filter, a second input coupled to said first output of the filter circuit, and a third input coupled to at least one output of said brilliance estimation circuit; and

a second image characteristic adjusting circuit for at least a second image characteristic, operated in a manner based on Fuzzy logic, having a first input coupled to said second output of the filter circuit and a second input coupled to said at least one output of the brilliance estimation circuit.

5,589,891

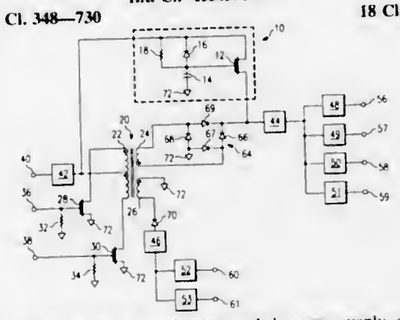
VIDEO SYNCHRONIZED POWER MODULE

William P. McCracken, Garland, and Neal Cooper, Coppell, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 17, 1994, Ser. No. 245,382

Int. Cl.[6] H04N *5/63*

U.S. Cl. 348—730 **18 Claims**



1. A synchronized transformer-coupled power supply circuit comprising:

a transformer;

an input power signal coupled to a primary winding of the transformer;

voltage regulators coupled to secondary windings of the transformer;

a start-up circuit for coupling the input power signal directly to one of the voltage regulators; and

a first switch coupled between a first end of the primary winding and a common node; and

a second switch coupled between a second end of the primary winding and the common node, wherein the first switch and the second switch are synchronized to switch during video horizontal blanking periods.

5,589,892

ELECTRONIC TELEVISION PROGRAM GUIDE SCHEDULE SYSTEM AND METHOD WITH DATA FEED ACCESS

Robert A. Knee, 747 Grissom Dr., Lansdale, Pa. 19446; Anthony R. Favla, 4382 S. Billings Cir., Aurora, Colo. 80015; Bruce Davis, 5505 Preserve Pkwy. South, Greenwood Village, Colo. 80121, and Larry Miller, 35 Glenmoore Dr., Greenwood Village, Colo. 80111

Continuation-in-part of Ser. No. 428,809, Apr. 24, 1995, which is a continuation-in-part of Ser. No. 247,101, May 20, 1994, which is a continuation-in-part of Ser. No. 119,367, Sep. 9, 1993. This application Jun. 7, 1995, Ser. No. 476,217

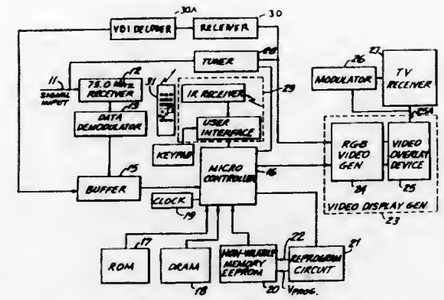
Int. Cl.[6] H04N *5/50;5/445*

U.S. Cl. 348—731 **5 Claims**

1. An electronic television program schedule system comprising:

storage means for storing program schedule information for a plurality of television programs, said program schedule information comprising, for at least one of said programs, information identifying said at least one program as a live event;

data processing means for generating video display control commands;



means for receiving a data feed during the pendency of said live event, said data feed comprising information regarding the status of said live event;

means for correlating said program schedule information for said live event with said status information for said live event;

a video display generator for receiving said video display control commands from said data processing means, said program schedule information from said storage means, and said status information from said data feed, wherein said video display generator: generates a display signal concurrently comprising said program schedule information for said live event and said status information for said live event.

5,589,893

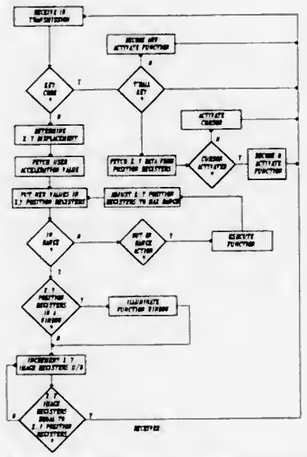
ON-SCREEN REMOTE CONTROL OF A TELEVISION RECEIVER

Kevin J. Gaughan, Arlington Heights, and Thomas J. Zato, Inverness, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 1, 1994, Ser. No. 347,929

Int. Cl.[6] H04N *5/445*

U.S. Cl. 348—734 **3 Claims**



1. A method of remotely controlling a television receiver comprising:

assigning portions of a television viewing screen for controlling different television receiver functions;

selecting said different television receiver functions by means of a movable on-screen cursor;

moving said movable on-screen cursor responsive to IR X,Y displacement data based upon rotation of a trackball;

activating said different television receiver functions selected by said movable on-screen cursor via a switch operated by depression of said trackball; and

selectively illuminating said portions of said television viewing screen as they are approached by said movable on-screen cursor.

5,589,894

Patent Not Issued For This Number

5,589,895

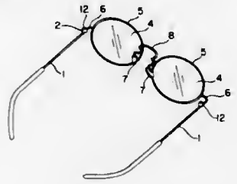
HINGE STRUCTURE OF A SPECTACLE FRAME

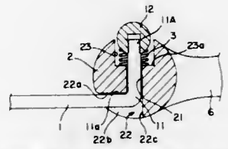
Koji Mizuno, 30-66, Sugimotocho, Sabae-shi, Fukui-ken, Japan

Filed Dec. 1, 1995, Ser. No. 565,669

Int. Cl.[6] G02C *5/22;5/14;5/00*

U.S. Cl. 351—153 **4 Claims**





1. A hinge structure of a spectacle frame, in which bearings **2** are formed at the ends of end pieces **6** provided outside a pair of lenses **4** or outside the rims **5** supporting the lenses **4**, and pivotally rotatable shafts **11** at the tips of a pair of temples **1** are pivotally rotatably connected with the bearings **2**, comprising:

each of said bearings **2**, being provided with a vertical through-hole **21**, a cut-out portion **22** formed at the bottom of said through-hole **21** and surrounded by a top sliding face **22*a*** and both side contact faces **22*b*** and **22*c***, and a recess **23** formed at the top of said through-hole **21** and having a support face **23*a*** at the bottom; each of said temples **1**, being provided with the pivotally rotatable shaft **11** bent almost at right angles at its tip with some length and inserted in the through-hole **21** of the bearing **2**, a top sliding face **11*a*** near the bend to slidably contact the sliding face **22*a*** of said cut-out portion **22**, and a flange **12** protruded at the tip of the pivotally rotatable shaft **11** exposed from the recess **23**; and a compressed elastic means **3**, being provided around the pivotally rotatable shaft **11** exposed in the recess **23** between the flange **12** and the support face **23*a***, to give pressure to the bearing **2** for keeping the sliding face **11*a*** of the temple **1** in slidable contact with the sliding face **22*a*** of the bearing **2**.

5,589,896

ADJUSTABLE INDIRECT OPHTHALMOSCOPY LENS

Martin A. Mainster, Leawood, Kans.; Janet L. Crossman, and Robert D. Johnson, both of Bellevue, Wash., assignors to Ocular Instruments, Inc., Bellevue, Wash.

Filed Oct. 26, 1994, Ser. No. 329,711

Int. Cl.[6] A61B *3/00;3/10;* **G02B** *15/14*

U.S. Cl. 351—219 **4 Claims**

1. A lens used in indirect ophthalmoscopy for viewing the fundus of the eye comprising:

a posterior lens having a posterior surface and an anterior surface, the posterior surface having a predetermined curvature and being adapted to be placed in juxtaposition with the cornea, the anterior surface having a predetermined curvature,

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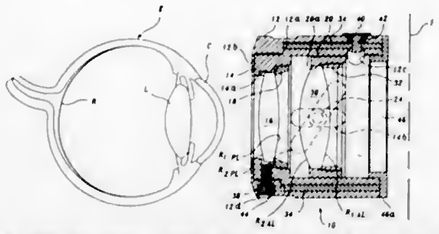


at least one anterior lens having an anterior surface and a posterior surface, the surfaces of the posterior lens and the surfaces of the anterior lens having curvatures adapted to focus light rays emanating from the fundus when the posterior lens is in juxtaposition to the cornea in an aerial image anterior to and in close proximity to the anterior surface of the anterior lens, and

means for coupling said posterior lens and said anterior lens together so that the anterior lens and the posterior lens are substantially coincident along their optical axes, and so that the anterior lens and posterior lens can be moved axially relative to each other between a proximal position and a distal position, the surfaces of the posterior lens and the surfaces of the anterior lens cooperating to change the magnification of the aerial image from at least a first predetermined value when the anterior lens is in a proximal position to a second predetermined value when the anterior lens is in the distal position.

5,589,897

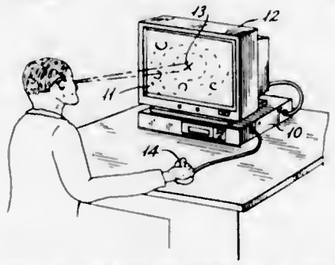
METHOD AND APPARATUS FOR CENTRAL VISUAL FIELD MAPPING AND OPTIMIZATION OF IMAGE PRESENTATION BASED UPON MAPPED PARAMETERS

Stephen H. Sinclair, 1208 Henry La., Gladwyne, Pa. 19035; Jonathan Nissanov, Philadelphia, and Amitabha Gupta, Pittsburgh, both of Pa., assignors to Stephen H. Sinclair, Gladwyne, Pa.

Continuation of Ser. No. 432,015, May 1, 1995, abandoned. This application Dec. 22, 1995, Ser. No. 576,859

Int. Cl.[6] A61B *3/02*

U.S. Cl. 351—223 **21 Claims**



1. A method for optimizing the presentation of visual information to a person having a sub-optimal central field of vision comprising the steps of:

A. Determining the geometry of the person's central visual field with regard to perception of high contrast images;

B. Measuring parameters representative of contrast sensitivity of the person at a plurality of locations within the determined central visual field;

C. Measuring parameters representative of luminance sensitivity at a plurality of locations in the determined central visual field;

D. Measuring parameters representative of perceived spatial distortion of locations within the determined central visual field;

E. Modifying and enhancing the visual information in accordance with the measured parameters to create individualized visual information;

F. Presenting the individualized visual information to the person's functional areas of the central visual field.

5,589,898

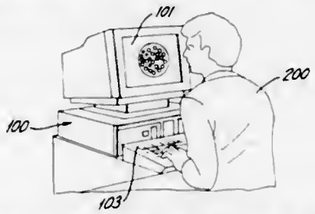
METHOD AND SYSTEM FOR COLOR VISION DEFICIENCY CORRECTION

Holly G. Atkinson, Bridgewater, Conn., assignor to Reuters Limited, London, England

Filed Jun. 7, 1995, Ser. No. 474,257

Int. Cl.[6] A61B *3/02;3/00*

U.S. Cl. 351—237 **11 Claims**



1. A method for determining color vision defects of a user of a computer system comprising a processing means, display means, input means and memory means, and for altering a color palette displayed on the display means to compensate for any color vision defect comprising the steps of:

a. storing in the memory means data comprising a plurality of color vision test images and medical information on color vision deficiencies;

b. causing the processing means sequentially to place one or more of the test images on the display means;

c. providing the user with certain instructions concerning his perception of the content of each displayed image;

d. receiving the user's response to the instruction as entered through the input means,

e. storing the response in the memory means;

f. comparing in the processing means the user's response with medical information on color vision deficiencies stored in the memory means to determine the nature of the user's color vision deficiency;

g. storing in the memory means a plurality of color palettes for the display means, at least one of which palettes compensates for color vision deficiencies;

h. determining, in response to the comparing step, which of the plurality of color palettes is optimal in view of the user's color deficiency as determined from his responses; and

i. causing the system to set the display means to display the optimal color palette.

5,589,899

OPTHALMOLOGIC APPARATUS HAVING A SLIDABLE BED

Yasuo Maeda, Kawasaki, and Kyoji Sekiguchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 361,044

Claims priority, application Japan, Dec. 22, 1993, 5-324577

Int. Cl.[6] A61B *3/00;3/14*

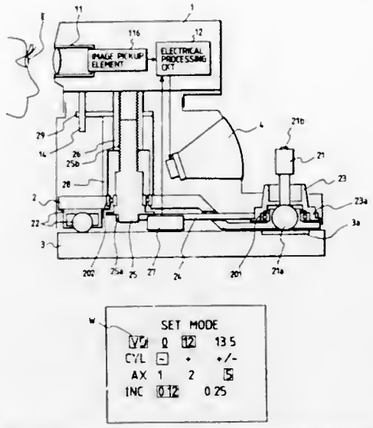
U.S. Cl. 351—245 **13 Claims**

1. An ophthalmologic apparatus comprising:

a base;

a slidable bed slidable on said base;

input means for inputting instruction for sliding said slidable bed relative to said base from a user;



display means for effecting image display of a stored instruction image; and

control means for controlling an image display of the stored instruction image on said display means on the basis of an input effected by said input means by a technique similar to the input of instructions for sliding said slidable bed.

5,589,900

VIRTUAL DRUM IMAGESETTER

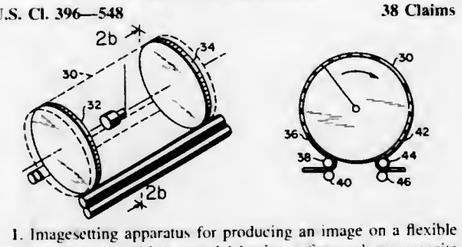
Michael Sterflinger, Huntington, N.Y., assignor to Exxtra Corporation, Hauppauge, N.Y.

Division of Ser. No. 196,875, Feb. 15, 1994, Pat. No. 5,404,187, which is a continuation of Ser. No. 823,527, Jan. 21, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,559

The portion of the term of this patent subsequent to Apr. 4, 2012, has been disclaimed.

Int. Cl.[6] G03B *41/00*

U.S. Cl. 396—548 **38 Claims**



1. Imagesetting apparatus for producing an image on a flexible section of photosensitive material having a first end, an opposite second end and two substantially parallel side edges extending between said first and second ends and containing between them an available image area, said apparatus comprising:

(a) means for retaining said section in a cylindrical arcuate configuration, said retaining means including two circular arced supports, each support being in physical contact with the surface of said photosensitive material immediately adjacent one of said edges outside of said image area and delimiting a side of said image area, said cylindrical arcuate configuration having a central axis;

(b) means for selectively exposing said image area to radiation to produce said image, said exposing means including means for directing a modulated beam of radiation along said axis, means for redirecting said beam at an angle with respect to said axis toward said image area, means for rotating said redirecting means about said axis so as to scan said beam in the circumferential direction substantially parallel to said two edges, and means for translating said redirecting means in the axial direction so as to scan said beam in a direction substantially perpendicular to said edges, thereby to produce a two dimensional image,

wherein no physical contact is made with said section in the image area thereof during exposing of the two dimensional image.

5,589,901

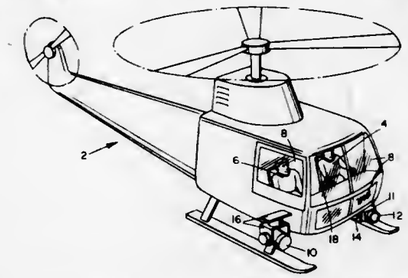
APPARATUS AND METHOD FOR SYNCHRONIZING SEARCH AND SURVEILLANCE DEVICES

Kevin P. Means, 3126 Goldsmith St., San Diego, Calif. 92106

Filed May 15, 1995, Ser. No. 441,121

Int. Cl.[6] G03B *39/00*

U.S. Cl. 396—12 **21 Claims**



1. Apparatus for search and surveillance from a moving vehicle by an observer within said vehicle, which comprises:

a lamp projecting a directable beam of visible light, said lamp being mounted in a movable lamp gimbal attached to the exterior of said vehicle, and said beam being visible to said observer from within said vehicle; lamp positioning means for positioning said lamp gimbal to aim said beam of visible light and of said camera to aim said camera at said object; and a pair of lamp gimbal signal generators generating respectively an azimuth position signal and an altitude signal indicating respectively the azimuth position and the altitude position of said lamp within said lamp gimbal;

a camera for detecting an image of any object in light of visible or infrared wavelength, said camera being mounted in a movable camera gimbal attached to the exterior of said vehicle, and said image of said object being visible to said observer from within said vehicle; camera positioning means for positioning said camera gimbal to aim said camera at said object; and a pair of camera gimbal signal generators generating respectively an azimuth position signal and an altitude signal indicating respectively the azimuth position and the altitude position of said camera within said camera gimbal;

control means operable by said observer for controlling said lamp positioning means to position said lamp gimbal;

a comparator for comparing said position signals from said camera and lamp gimbal signal generators with each other, and in response thereto causing said positioning means of said camera gimbal to move said camera into alignment with said lamp;

said comparator also alternatively comparing said position signals of said camera gimbal signal generator with predetermined position signals generated by a manually tunable signal generator;

whereby said comparator permits synchronized positioning of said camera with said lamp or predetermined positioning of said lamp independently of positioning of said camera.

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5,589,902

INTEGRATED AUTOMATIC INSTALLATION FOR TAKING PHOTOGRAPHS OR SEQUENCES OF PHOTOGRAPHS

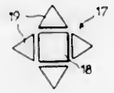
Henri Gruel, Grenoble; Michel Moraine, and Serge Crasnianski, both of Meylan, all of France, assignors to KIS Photo Industrie (SARL), France

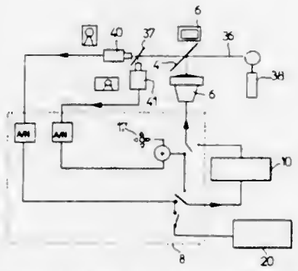
Continuation of Ser. No. 38,919, Mar. 29, 1993, abandoned. This application Apr. 4, 1995, Ser. No. 417,264

Claims priority, application France, Mar. 30, 1992, 92 04041

Int. Cl.[6] G03B *29/00*

U.S. Cl. 396—3 **22 Claims**





1. An installation for taking photographs or sequences of photographs, comprising:

acquisition means for receiving analog signals from an optical image of a subject of which it is desired to take a photograph or a sequence of photographs, said subject being positioned within the installation and in view of said acquisition means and wherein said acquisition means defines an acquisition axis and includes two cameras whose fields of acquisition are, respectively, vertical and horizontal, the optical axis of one of said two cameras being coincident with said acquisition axis by means of a second half-silvered mirror positioned along the bisector of the real optical axes of said two cameras so that the acquisition of images is effected equally by either or both of said cameras as a function of the type of photograph desired;

memory means for storing the optical information received by said acquisition means;

a first screen, connected to said acquisition means, for allowing simultaneous viewing by the subject of the image received by said acquisition means;

photographing means for taking the desired photograph or the sequence of photographs;

a first half-silvered mirror, mounted on the optical axis of said acquisition means and being directed along a bisector of the angle defined by the optical axes of said acquisition means and said first screen respectively, so as to generate a virtual image of said first screen on the optical axis of said acquisition means;

a central processing unit, connected to said acquisition means and photographing means, being fitted with a digitization card intended to digitize the analog signals received by said acquisition means, the digital signals thereby obtained being capable of undergoing processing by said central processing unit to be conveyed to said first screen so as to allow simultaneous viewing by the subject of the image or of the images received by said acquisition means and, optionally, capable of further processing by said central processing unit upon command of the subject; and

an interaction element, interposed between said central processing unit and the subject, capable of being actuated by the subject while positioned within the installation and viewing the image on said first screen, to freeze the image reproduced on said first screen at the instant of the image's actuation in said memory means and capable of inducing the image's production on a medium by said photographing means upon further actuation by the subject.

5,589,903

PANORAMA HEAD FOR OPTICAL EQUIPMENT PARTICULARLY FOR PHOTOGRAPHIC EQUIPMENT

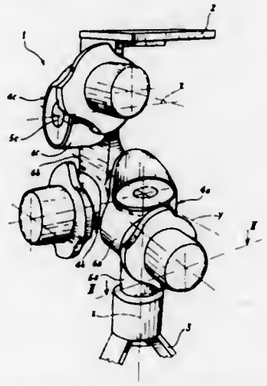
Paolo Speggiorin, Mussolente, Italy, assignor to Lino Manfrotto & Co., S.p.A., Bassano Del Grappa, Italy

Filed May 16, 1995, Ser. No. 442,533

Claims priority, application Italy, Jul. 20, 1994, PD94A0135

Int. Cl.[6] G03B *17/00*

U.S. Cl. 396—428 **14 Claims**



1. A panorama head for optical equipment, particularly for photographic equipment, for positioning the equipment precisely relative to a system of axes, comprising an articulated joint for each axis, each articulated joint including first and second joint elements which are coupled with one another for rotation about the corresponding axis and can be clamped selectively in a preselected angular position relative to said corresponding axis, characterized in that wherein at least one of the articulated joints comprises a kinematic reduction coupling with first and second coupling elements which are fixed to the first and second joint elements, respectively, during rotation about the corresponding axis and can be moved between a position of mutual coupling for precision adjustments and a position of mutual disengagement for quick positioning.

5,589,904

CAMERA WHICH PERFORMS MOTION COMPENSATION FOR SEQUENTIAL PHOTOGRAPHS BY CONTINUOUSLY DETECTING MOTION UNTIL THE FINAL PHOTOGRAPH IS TAKEN

Keishi Urata, and Toshiyuki Nakamura, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 12, 1995, Ser. No. 571,178

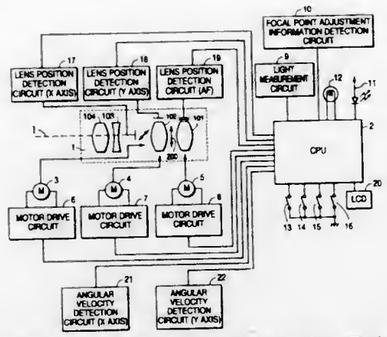
Claims priority, application Japan, Dec. 14, 1994, 6-310516

Int. Cl.[6] G03B *5/00*

U.S. Cl. 396—55 **11 Claims**

1. A camera which takes a first photograph upon initiation of exposure, and then takes a second photograph after the first photograph is taken, the camera comprising:

an exposure control mechanism causing the camera to take the first photograph after a first time period elapses from the initiation of exposure, and to take the second photograph after a second time period elapses from the first photograph being taken; and



a motion detector continuously detecting motion affecting the camera prior to the first photograph being taken until after the second photograph is taken.

5,589,905

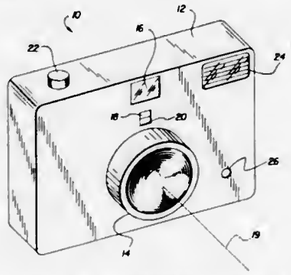
CAMERA WITH ILLUMINATION SOURCE

Dale F. McIntyre, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1995, Ser. No. 378,129

Int. Cl.[6] G03B *13/16;13/18*

U.S. Cl. 396—431 **9 Claims**



1. A camera device for a photographer viewing a scene to be photographed comprising an illumination source for illuminating the scene, and means for linearly scanning the scene with said illumination source to provide a visible linear indication of a scanned region of the scene, is characterized by:

control means for automatically varying the brightness of the illumination in accordance with changes in one or more scene parameters, to ensure constant visibility of the linear indication.

5,589,906

APERTURE DEVICE FOR A CAMERA

Hitoshi Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1995, Ser. No. 516,556

Claims priority, application Japan, Aug. 25, 1994, 6-222750

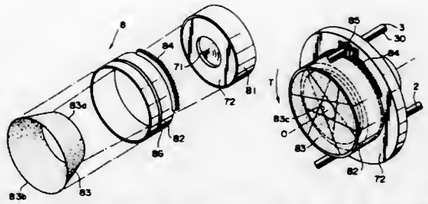
Int. Cl.[6] G03B *9/02*

U.S. Cl. 396—505 **21 Claims**

1. An aperture device for defining an aperture through which light can pass along an optical axis, comprising:

a resilient opaque tube supported coaxially with said optical axis;

means for constricting an intermediate portion of said resilient opaque tube by rotating at least a portion of said tube to form a circular aperture for controlling an amount of said light passing through said resilient opaque tube.



5,589,907

CAMERA HAVING AN INFORMATION SETTING APPARATUS FOR SETTING PHOTOGRAPHIC DATA

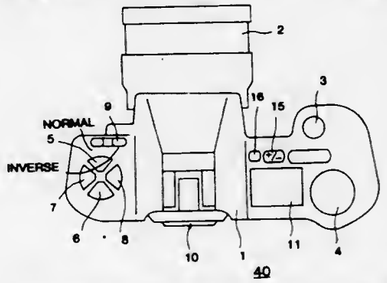
Toshiaki Hozumi, Tokyo, and Hidehiro Ogawa, Funabashi, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,710

Claims priority, application Japan, Sep. 7, 1994, 6-213635

Int. Cl.[6] G03B *17/00*

U.S. Cl. 396—287 **17 Claims**



1. A camera having a setting value for photography, said camera comprising:

an information setting unit to increase and decrease the setting value of the camera through motion in first and second directions; and

a determination unit having a normal mode and an inverse mode, wherein said determination unit causes said information setting unit to increase the setting value through motion in the first direction and decrease the setting value through motion in the second direction in the normal mode, and said determination unit causes said information setting unit to decrease the setting value through motion in the first direction and increase the setting value through motion in the second direction in the inverse mode.

5,589,908

CONTROL FOR VARIABLE MAGNIFICATION IN AN IMAGING APPARATUS

Yoshiaki Irie, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 338,780

Claims priority, application Japan, Nov. 29, 1993, 5-298573

Int. Cl.[6] G03B *3/00*

U.S. Cl. 396—51 **6 Claims**

1. An imaging apparatus having a predetermined image plane, said apparatus comprising:

a variable magnification optical system for magnifying an image in the image plane with a variable magnification;

detecting means for detecting a distance related to each of a plurality of image areas in the image plane

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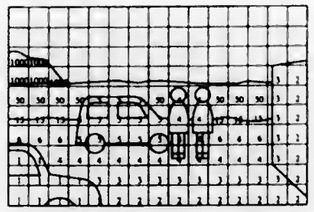


means for designating a plurality of image portions by grouping together adjacent image areas having distance values that differ from each other by less than a predetermined amount:

means for manually selecting one of the plurality of image portions designated by said designating means; and

means for controlling the magnification of said variable magnification optical system in accordance with a size of the image portion selected by said manual selecting means.

5,589,909

AUTOMATIC FOCUS ADJUSTMENT CAMERA WITH HIGH SPEED SEQUENTIAL PHOTOGRAPHY CAPABILITY, AND METHOD OF AUTOMATIC FOCUS ADJUSTMENT THEREFOR

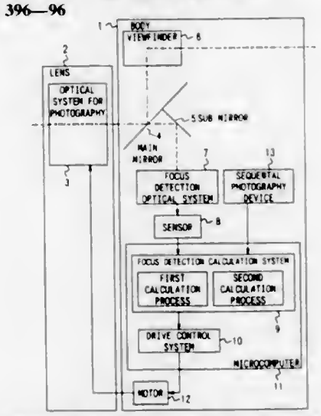
Yosuke Kusaka, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 360,443

Claims priority, application Japan, Dec. 24, 1993, 5-328334

Int. Cl.[6] G03B *13/36*

U.S. Cl. 396—96 **12 Claims**



1. An automatic focus adjustment camera, comprising:

a sequential photography device which performs photographic action sequentially;

a photographic optical system, which is driven so as to be focused;

a charge accumulation type image sensor which outputs target object image data corresponding to a distribution of intensity of illumination in an image of a target object to be photographed;

a focus detection optical system which forms said image of said target object on said charge accumulation type image sensor from light from said target object which has passed through said photographic optical system;

a time detection device which detects charge accumulation time of said charge accumulation type image sensor;

a focus detection device which detects the focus adjustment state of said photographic optical system by:

performing a first calculation process upon said target object image data output from said charge accumulation type image sensor when sequential photographic operation is not being performed by said sequential photography device or accumulation time of said charge accumulation type image sensor detected by said time detection device is shorter than a predetermined value; and,

performing a second calculation process, different from said first calculation process, upon said target object image data which is output from said charge accumulation type image sensor when sequential photographic operation is being performed by said sequential photography device and accumulation time of said charge accumulation type image sensor detected by said time detection device is longer than said predetermined value; and,

a drive device which drives said photographic optical system so as to focus it, based upon the adjustment state detected by said focus detection device.

5,589,910

APPARATUS FOR MEASURING A DISTANCE

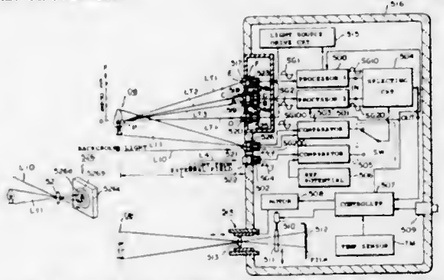
Tatsuo Saito, and Shigenori Goto, both of Oomiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Dec. 14, 1994, Ser. No. 357,431

Claims priority, application Japan, Dec. 15, 1993, 5-315431; Dec. 15, 1993, 5-315441; Dec. 15, 1993, 5-315458; Dec. 15, 1993, 5-315461

Int. Cl.[6] G03B *13/36*

U.S. Cl. 396—106 **10 Claims**



1. An apparatus for measuring a distance to an object, comprising:

(a) a first processing unit for calculating the distance to said object, based on an input signal;

(b) a second processing unit for calculating the distance to said object, based on an input signal;

(c) a first distance measuring unit of an active method for projecting first light toward said object in order to calculate the distance to the object by said first processing unit and detecting said first light reflected by said object to output a signal detected to said first processing unit;

(d) a second distance measuring unit of a passive method for detecting two light beams from said object, having passed through mutually different paths, in order to calculate the distance to the object by said second processing unit and outputting a signal detected to said second processing unit;

(e) a semiconductor photodetector comprising a first photodetecting region, a second photodetecting region surrounding said first photodetecting region, and an insulator located between said first photodetecting region and said second photodetecting region;

(f) an optical system arranged so that light from said object is incident to said first photodetecting region and so that light from the surroundings of said object is incident to said second photodetecting region;

(g) a comparator into which an output signal from said first photodetecting region and an output signal from said second photodetecting region are put; and

(h) a selecting circuit into which a first output signal from said first processing unit and a second output signal from said second processing unit are put and which outputs said first output signal or said second output signal depending upon an output from said comparator.

5,589,911

AUTOFOCUSING APPARATUS FOR CAMERA HAVING MULTIPLE RANGING DEVICE

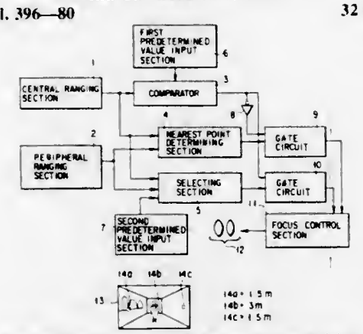
Osamu Nonaka, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 162,340, Dec. 3, 1993, abandoned. This application Dec. 11, 1995, Ser. No. 570,364

Claims priority, application Japan, Dec. 9, 1992, 4-329481; Jan. 8, 1993, 5-1542; Mar. 2, 1993, 5-41510

Int. Cl.[6] G03B *3/00;13/18*

U.S. Cl. 396—80 **32 Claims**



1. An autofocusing apparatus for a camera, comprising:

a photographing lens for forming an object image on a film surface;

a first ranging unit for measuring a distance to an object located at a substantially central portion of a photographic frame of said camera, and for outputting a first ranging result;

a second ranging unit for measuring a distance to an object located at a peripheral portion of the photographic frame, and for outputting a second ranging result;

a control unit for receiving the first and second ranging results obtained by said first and second ranging units and for determining a focusing position of said photographing lens, said control unit determining whether the first ranging result obtained by said first ranging unit is larger than a first predetermined distance which is relatively short, and, when said control unit determines that the first ranging result is larger than the first predetermined distance, said control unit selecting and outputting one of the first and second ranging results which is nearer to a second predetermined distance which is larger than said first predetermined distance, wherein said first and second ranging results indicate distance which are at least one of far from and near to said second predetermined distance; and

a focus control unit for receiving the output from said control unit and for controlling said photographing lens on the basis of the output from said control unit.

5,589,912

CAMERA WITH IMAGE STABILIZING DEVICE

Yasuhiko Shiomi, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 154,720, Nov. 19, 1993, abandoned, which is a division of Ser. No. 973,955, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 743,033, Aug. 9, 1991, Pat. No. 5,175,580. This application May 19, 1995, Ser. No. 444,921

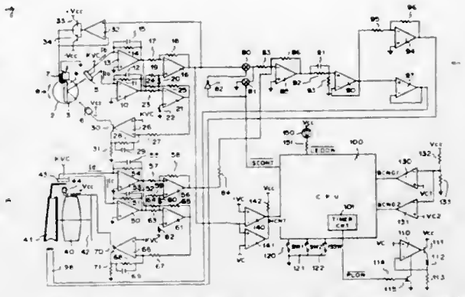
Claims priority, application Japan, Aug. 14, 1990, 2-214634

Int. Cl.[6] G03B *7/00*

U.S. Cl. 396—55 **15 Claims**

1. An apparatus for use with an image blur prevention device including an image blur detection unit and an image blur prevention unit responsive to an output of the image blur detection unit for preventing image blur, the apparatus comprising:

a determination device for determining a state of a power supply for supplying power to the image blur prevention device; and



a control device for controlling the image blur prevention unit in a first control mode or a second control mode, said control device switching between the first control mode and the second control mode in accordance with a determination result of said determination device.

5,589,913

Patent Not Issued For This Number

5,589,914

DENSITY DETECTING DEVICE USED FOR IMAGE FORMING APPARATUS

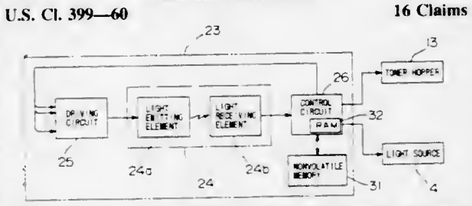
Kenji Katsuhara, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 21, 1995, Ser. No. 517,232

Claims priority, application Japan, Sep. 20, 1994, 6-225177

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—60 **16 Claims**



15. A density detecting device for detecting a density of a toner image formed by an image forming apparatus including a photoreceptor on which an electrostatic latent image is formed and a developing device for developing the electrostatic latent image formed on the photoreceptor into a toner image, the density detecting device comprising:

a density sensor for irradiating light onto a photoreceptor to output density data corresponding to an amount of light reflected from the photoreceptor and capable of varying an amount of light to be irradiated onto the photoreceptor;

means for finding a first amount of light to be irradiated onto the photoreceptor to detect a toner image density from the density sensor at a time of initialization;

characteristic curve acquiring means for setting the first amount of light as the amount of light to be irradiated onto the photoreceptor, and further for causing the density sensor to detect a density of a toner image having a known density, at the time of initialization, thereby to acquire an input-output characteristic curve of the density sensor;

means for finding a second amount of light to be irradiated onto the photoreceptor from the density sensor in order to detect a toner image density at a time of density detection; and

density operating means for referring to the density data outputted by the density sensor and the input-output characteristic curve, at the time of density detection, to find the toner image density.

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5,589,915

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS WITH TONER BOX EXCHANGE ALARM FEATURE

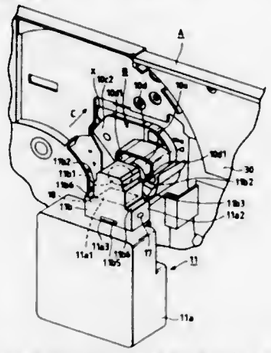
Kouji Hashimoto, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 403,412

Claims priority, application Japan, Mar. 15, 1994, 6-044035; Mar. 7, 1995, 7-047241

Int. Cl.[6] G03G *21/10*

U.S. Cl. 399—120 **38 Claims**



16. An image forming apparatus for forming an image on a recording medium, comprising:

a main body of the image forming apparatus;

a toner container mounting means for removably mounting a toner container for containing toner removed from an image bearing member provided in said main body, said toner container being removably mounted to said main body; and

a detection means for detecting a condition that the toner in said toner container has not risen to a predetermined amount when said toner container is mounted onto said main body and a condition that said toner container is not mounted onto said main body.

5,589,916

DEVELOPING APPARATUS

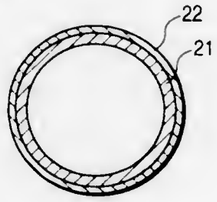
Masaki Sutoh, and Shinichiro Fukunaga, both of Saitama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,486

Claims priority, application Japan, May 28, 1993, 5-126668; Apr. 8, 1994, 6-070590

Int. Cl.[6] G03G *15/06*

U.S. Cl. 399—286 **9 Claims**



1. A developing apparatus, comprising:

an electrostatic latent image holder; and

a developer support for supplying a charge developer to an electrostatic latent image formed on said electrostatic latent image holder,

said developer support having a nonmagnetic substrate in a shape of a hollow cylinder, wherein said substrate comprises at least one metal and an amorphous film formed on said nonmagnetic substrate, wherein said amorphous film consists essentially of an element selected from chrome or zinc, said at least one metal, oxygen, and hydrogen.

5,589,917

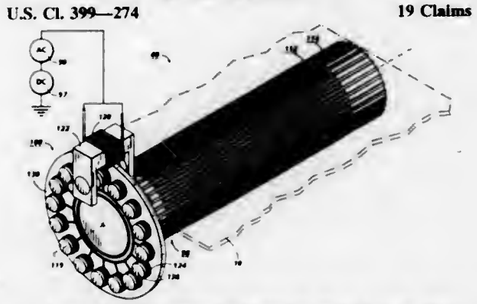
DONOR ROLLS WITH MAGNETICALLY COUPLED (TRANSFORMER) COMMUTATION

Steven C. Hart, Webster, and Delmer G. Parker, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 25, 1995, Ser. No. 533,627

Int. Cl.[6] G03G *15/08*

U.S. Cl. 399—274 **19 Claims**



1. A donor roll for transporting marking particles to an electrostatic latent image recorded on a surface, comprising:

electrostatic latent image recorded on a surface, comprising:

a rotatably mounted body;

an electrode member mounted on said body;

a magnetically permeable core external to said body and rotatable therewith;

an electrically conductive material positioned on said core, said material electrically connected to said electrode member; and

a second magnetically permeable core spaced from said first mentioned magnetically permeable core.

5,589,918

PROCESS CARTRIDGE, ASSEMBLING METHOD THEREFOR AND ELECTROPHOTOGRAPHIC APPARATUS

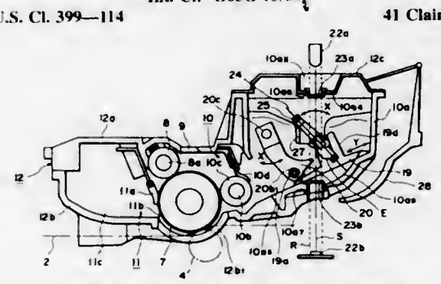
Haruhisa Oshida, Hatogaya; Keiji Okano, Tokyo; Masahide Kinoshita; Koji Takahashi, both of Yokohama; Yasushi Shimizu, Tokyo, and Akira Domon, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1995, Ser. No. 380,420

Claims priority, application Japan, Jan. 28, 1994, 6-008568

Int. Cl.[6] G03G *15/06*

U.S. Cl. 399—114 **41 Claims**



1. A process cartridge detachably mountable to an image forming apparatus, wherein said image forming apparatus includes light emitting means and light receiving means cooperative with said light emitting means to detect an amount of toner in a part of said process cartridge, said process cartridge comprising:

an electrophotographic photosensitive member;

process means actable on said electrophotographic photosensitive member;

a toner container, adapted for being mounted in the part of said process cartridge, for containing the toner to be used for developing a latent image formed in said electrophotographic photosensitive member;

a light transmitting member, provided in said toner container, for transmitting light emitted from said light emitting means to the light receiving means to permit detection of the amount of the toner in said toner container when said process cartridge is mounted to a main assembly of said image forming apparatus;

a cover member movable between a protecting position for protecting said electrophotographic photosensitive member and a retracted position wherein said cover member is retracted from the protecting position;

wherein in response to mounting of said process cartridge to the image forming apparatus, said cover member moves from a position where it covers a part of said photosensitive member toward a position beyond where said light transmitting member is disposed.

5,589,919

TONER CARTRIDGE AND COLOR IMAGE FORMING APPARATUS IN USE THEREWITH

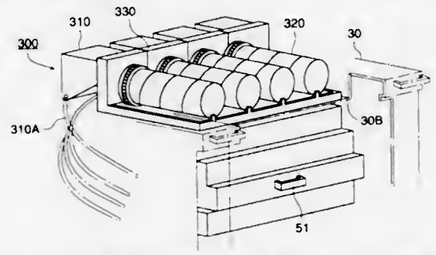
Yoshikazu Ikunami; Satoshi Minami, and Yozo Fujii, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Apr. 18, 1995, Ser. No. 423,314

Claims priority, application Japan, Apr. 26, 1994, 6-088807; May 26, 1994, 6-112812

Int. Cl.[6] G03G *15/08*

U.S. Cl. 399—262 **16 Claims**



1. A toner supplying apparatus for supplying a toner to a developing station of an image forming machine, comprising:

a toner cartridge;

a toner receiver means for receiving said toner from said toner cartridge and for conveying said toner to said developing station;

said toner cartridge including:

a cylindrical container for accommodating toner therein; wherein said cylindrical container includes an spiral protrusion, provided on an inner circumferential surface of said cylindrical container, for conveying said toner in a direction of an axis in said cylindrical container when said cylindrical container is rotated on said axis;

wherein said toner cartridge and said toner receiver are arranged on a same horizontal plane; and

a scooper for scooping said toner conveyed by said spiral protrusion and for discharging said toner to said toner receiver; said scooper operating to scoop said toner during said rotation of said cylindrical container.

5,589,920

IMAGE FORMING APPARATUS IN WHICH PLURAL TRANSFER MEDIA ARE CARRIED CONCURRENTLY

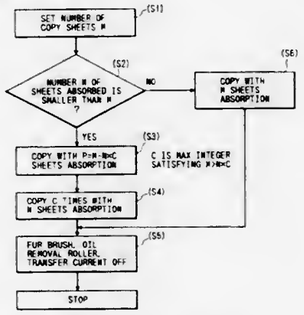
Takahiro Kubo, Tokyo; Masashi Suda, Iruma; Yoshihiro Murasawa, Yokohama; Takashi Hasegawa, Ageo; Satoshi Tamura, Yokohama; Hisashi Fukushima, Kawasaki, and Takeshi Menjo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 281,627, Jul. 28, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 497,340

Claims priority, application Japan, Jul. 30, 1993, 5-208314; Aug. 3, 1993, 5-212262; Dec. 24, 1993, 5-347983

Int. Cl.[6] G03G *15/14*

U.S. Cl. 399—145 **37 Claims**



14. An image forming apparatus comprising:

an image carrier for carrying an image thereon;

a transfer material bearing member for bearing and conveying a transfer material to a transfer position on said image carrier, said transfer material bearing member being capable of bearing multiple transfer materials concurrently; and

transfer means for transferring the image on said image carrier onto one or more transfer materials borne on said transfer material bearing member at said transfer position;

wherein in consecutively transferring the image onto M transfer materials, in which a number M is not divisible by a maximum number N of transfer materials that the transfer material bearing member is capable of bearing concurrently, said transfer material bearing member concurrently bears, at a first time, P transfer materials, where P is a number which is greater than or equal to 1 and which corresponds to a remainder obtained when M is divided by N, and wherein at other times, said transfer material bearing member bears N transfer materials.

5,589,921

INTERMEDIATE TRANSFER MEMBER HAVING A MATERIAL WHICH BREAKS DOWN IMPURITIES

Peter R. Markies, Grubbenvorst, and Mark Miedema, Em Velden, both of Netherlands, assignors to Oce-Nederland, B.V., Venlo, Netherlands

Filed Mar. 10, 1995, Ser. No. 402,051

Claims priority, application Netherlands, Mar. 11, 1994, 9400382

Int. Cl.[6] G03G *13/16*

U.S. Cl. 399—297 **30 Claims**

1. A device for transferring a toner image from an image-forming medium to a receiving material comprising:

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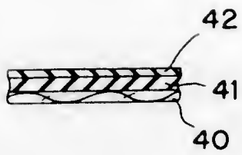


an image forming medium for supporting a toner image,

an endless movable intermediate medium movable in a transport direction having a support provided with a top layer secured via its rear surface to said support, said intermediate medium being in contact with said image-forming medium in a first transfer zone,

heating means for heating said toner image on said top layer of said intermediate medium,

a biasing means which in a second transfer zone can be brought into contact with said intermediate medium so as to transfer said toner image to said receiving material,

transport means for transporting said receiving material through said second transfer zone, and

means for breaking down impurities transferred by said receiving material to said top layer of said intermediate medium.

5,589,922

IMAGE FORMING APPARATUS

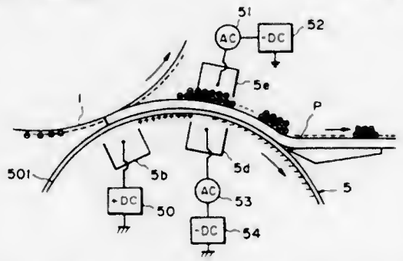
Koji Amemiya, Tokyo, and Masahiro Inoue, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 963,262, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 531,154, May 31, 1990, abandoned. This application Jan. 14, 1994, Ser. No. 182,515

Claims priority, application Japan, May 31, 1989, 1-138189; May 31, 1989, 1-138779; Aug. 30, 1989, 1-223695

Int. Cl.[6] G03G *15/14;15/16*

U.S. Cl. 399—315 **24 Claims**



1. An image forming apparatus, comprising:

an image bearing member on which a toner image is formed;

transfer material carrying means for carrying thereon a transfer material;

transfer charging means for performing an image transfer operation at an image transfer position for electrostatically transferring a toner image from said image bearing member onto a transfer material carried on said transfer material carrying means; and

discharging means, disposed downstream of the transfer position with respect to a movement direction of said transfer material carrying means, for acting on the transfer material carried on said transfer material carrying means after the image transfer operation, wherein said discharging means has a plurality of discharging electrodes arranged in the movement direction of the transfer material carrying means, and wherein an upstream one of the discharging electrodes exerts a weaker electric field on the transfer material carried on said transfer material carrying means than a downstream one of the discharging electrodes.

5,589,923

POWER SAVING METHOD OF AN IMAGE FORMING APPARATUS

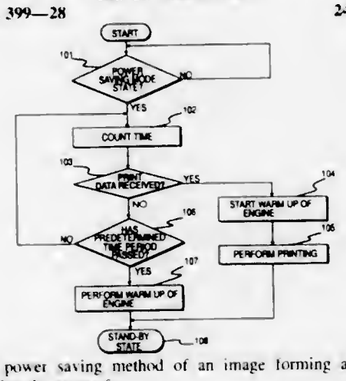
Don-Seon Lee, Kyungki-do, and Seong-Woo Kim, Suwon, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 24, 1995, Ser. No. 429,422

Claims priority, application Rep. of Korea, Apr. 27, 1994, 9016/1994

Int. Cl.[6] G03G *15/20*

U.S. Cl. 399—28 **24 Claims**



1. A power saving method of an image forming apparatus, comprising the steps of:

determining whether said image forming apparatus is in a power saving mode;

performing a timing operation while said image forming apparatus is in said power saving mode and no print data is input; and

warming up said image forming apparatus to a stand-by state where said image forming apparatus is capable of performing a printing operation when a duration of said timing operation exceeds a predetermined time period.

5,589,924

ELECTROPHOTOGRAPHIC IMAGE FORMING SYSTEM

Hideyuki Yano, Yokohama; Koichi Tanigawa, Tokyo; Akihiko Takeuchi, Yokohama; Hiroshi Sasame, Yokohama; Yasumasa Otsuka, Yokohama; Hiroto Hasegawa, Yokohama; Hideo Nanatani, and Kazuaki Ono, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 145,588, Nov. 4, 1993, which is a continuation of Ser. No. 840,536, Feb. 25, 1992, Pat. No. 5,321,482. This application Sep. 11, 1995, Ser. No. 526,281

Claims priority, application Japan, Mar. 1, 1991, 3-36168; Feb. 12, 1992, 4-25224

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—350 **22 Claims**

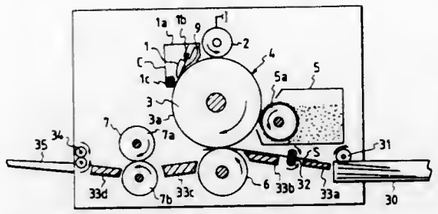
1. An electrophotographic image forming system for forming an image on a recording sheet, comprising:

a rotatable photosensitive member;

developing means for developing a latent image formed on said photosensitive member;

transfer means for transferring a toner image formed on said photosensitive member onto a recording sheet;

a cleaning blade contacting said photosensitive member to remove toner remaining on said photosensitive member after



a transfer operation by said transfer means, a portion of said cleaning blade contacting said photosensitive member being coated with graphite fluoride particles;

a charger member contacting said photosensitive member to charge it, and disposed downstream of said cleaning blade in a direction of rotation of said photosensitive member, between said cleaning blade and said developing means; and

conveying means for conveying a recording sheet.

5,589,925

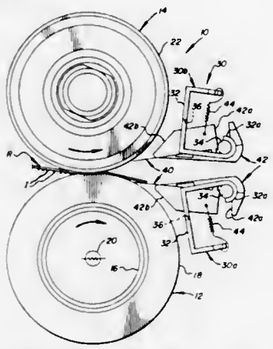
ANTI-GOUGING SKIVE MECHANISM WITH REPLACEABLE FINGERS

David F. Cahill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1994, Ser. No. 335,927

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—323 **6 Claims**



1. In a skive mechanism for stripping a receiver member adhering to a riser assembly roller, said skive mechanism including at least one simplified skive member comprising:

an elongated, substantially planar, relatively flexible skive finger, said skive finger defining an elongated slot oriented in the longitudinal direction of said skive finger, and a tab, formed at one end edge of said slot extending transverse to the direction of said slot in the plane of said skive finger; and

a support body for readily releasably receiving said skive finger to support a major portion of said skive finger so as to decrease the flexibility thereof, said support body having a first ledge upon which a skive finger can be slidably received, a second ledge opposed said first ledge and spaced therefrom a distance so as to positively engage the opposed planar surfaces of a skive finger to capture such skive finger therebetween, and a stop member positioned transverse to said slot to limit the distance to which the skive finger can slide along said first ledge in the direction of said slot.

5,589,926

COLOR IMAGE FORMING APPARATUS FOR FORMING A COLOR IMAGE BY TRANSFERRING COLOR TONER TO TRANSFER MEMBER

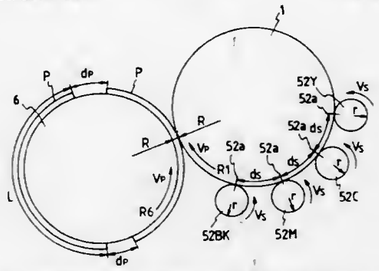
Yoshihiro Murasawa, Yokohama; Hisashi Fukushima, Kawasaki; Takeshi Menjo, Tokyo, and Takashi Hasegawa, Ageo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 503,540, Jul. 18, 1995, abandoned, which is a continuation of Ser. No. 213,501, Mar. 16, 1994, abandoned. This application Oct. 2, 1995, Ser. No. 538,037

Claims priority, application Japan, Mar. 19, 1993, 5-083783

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—302 **15 Claims**



1. A color image forming apparatus for forming a color image by transferring color toners onto a transfer material, comprising:

an endless loop electrophotographic photosensitive member having a loop length greater than a maximum length of images to be formed and transferred onto a transfer material;

color latent image forming means provided with optical means for projecting optical information corresponding to color images, for forming electrostatic latent images respectively corresponding to color images, on said photosensitive member;

plural color development means provided along the moving direction of said photosensitive member, opposed to said photosensitive member, and adapted to develop latent images formed on said photosensitive member with color toners supplied thereto by developing rollers, thereby forming color toner images; and

an endless loop transfer member adapted to effect an endless movement in synchronization with the electrophotographic photosensitive member and having a loop length A, in the moving direction of the photosensitive member, capable of simultaneously supporting two images of the maximum length L, and adapted to receive transfer of color toner images formed on said photosensitive member, in succession at a transfer position of said transfer member;

wherein a relation:

$$d_p > d_s \geqq 2r + (V_p/V_s)\pi r$$

is substantially satisfied, where A is the loop length of said transfer member in said endless moving direction, R is the radius and V_p is the peripheral speed of the transfer member when it is converted as circular, r is the radius and V_s is the peripheral speed of the developing rollers of said development means, d_p is a distance between two successive images on said transfer member at a position corresponding to a time during which said development means changes from one developing roller having one color toner to another developing roller having another color toner, and d_s is the distance between the developing rollers along the moving direction of the photosensitive member.

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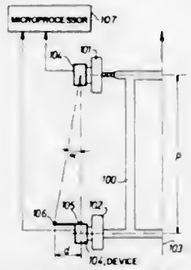
5,589,927

SYSTEM FOR MEASURING THE WHEEL BASE OF AN AUTOMOBILE FRAME AND THE TRANSVERSE AND LONGITUDINAL OFFSETS OF ITS STEERED WHEELS

Remo Corghi, Correggio, Italy, assignor to Corghi, S.p.A., Strada Statale, Italy

Filed Jan. 12, 1994, Ser. No. 180,327
Claims priority, application Italy, Feb. 16, 1993, RE93A0014
Int. Cl.[6] G01C *3/00;* **G01B** *11/26;5/24*
U.S. Cl. 356—3.12 **2 Claims**



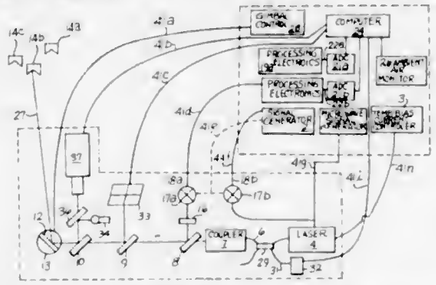
1. A system for measuring the wheel base of an automobile frame, comprising: a first device and a second device applied to the two automobile frame wheels positioned on the same side, said first device including two light emitting diodes (LEDs) located at a known distance (d) apart, measured in the horizontal plane, said second device including optical angle measurement means arranged to measure an angle (α) subtended between light rays emitted by said light emitting diodes, said optical angle measurement means of said second device including at least one cylindrical lens able to concentrate the light beams emitted by said light emitting diodes into light planes; a line of optical sensors arranged perpendicular to the axis of said lens for measuring the distance between the points of incidence of said light planes with said line of sensors; and a microprocessor arranged to calculate the angle (α) between said light planes on the basis of the geometrical characteristics of said second device, and to calculate the wheel base of the automobile frame on the basis of the geometrical characteristics of said first and said second device.

5,589,928

METHOD AND APPARATUS FOR MEASURING DISTANCE TO A TARGET

W. Randall Babbitt, Bellevue; John A. Bell; Barbara A. Capron, both of Issaquah, all of Wash.; Peter J. deGroot, Middletown, Conn.; Ronald L. Hagman, Renton, Wash.; John A. McGarvey, Bellevue, Wash.; William D. Sherman, and Paul F. Sjoholm, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 1, 1994, Ser. No. 299,714
Int. Cl.[6] G01B *11/02;* **G01C** *3/00*
U.S. Cl. 356—4.1 **11 Claims**



1. A device for measuring the distance to a target comprising:

means for generating an optical signal;

means for producing a plurality of modulation signals;

means for combining said optical signal with said modulation signals to produce a modulated output signal which is intensity modulated at a plurality of frequencies;

optical elements for directing said modulated output signal to said target and directing back a return signal reflected from said target, said optical elements including a mirror and a gimbal upon which said mirror is mounted for movement to a position where it reflects said modulated output signal onto said target;

a detector for detecting the return signal reflected back from said target;

a gimbal position control;

a power meter for measuring the power of the return signals;

a signal generator which generates reference signals, each of which is offset in frequency from a corresponding one of the intensity modulation frequencies by a predetermined amount;

means for combining the return signals with the reference signals to form a first set of intermediate frequency signals, each of which corresponds to one of said intensity modulation frequencies;

means for combining the modulation signals with the reference signals to form a second set of intermediate frequency signals, each of which corresponds to one of said intensity modulation frequencies; and

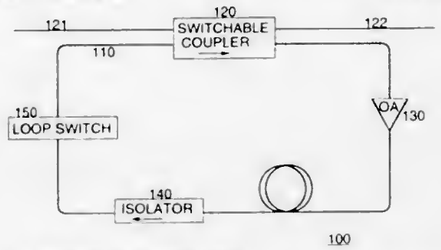
a computer for calculating a set of phase differences between said output beam and said return signals for each of said modulation frequencies from the first and second set of intermediate frequencies, and determining the distance to the target from said phase differences, and for receiving input from said power meter and to output instructions to said gimbal control so as to adjust the position of said gimbal to maximize the power of said return signals.

5,589,929

RF SIGNAL TRAIN GENERATOR AND INTERFEROCEIVERS

Ming-Chiang Li, 11415 Bayard Dr., Mitchellville, Md. 20721

Continuation-in-part of Ser. No. 18,388, Feb. 17, 1993, and a continuation-in-part of Ser. No. 877,419, May 1, 1992, Pat. No. 5,294,930, and a continuation-in-part of Ser. No. 787,085, Nov. 4, 1991, Pat. No. 5,296,860. This application Jan. 24, 1994, Ser. No. 185,177
Int. Cl.[6] G01C *3/08;* **G01S** *7/40;13/00;3/80*
U.S. Cl. 356—5.01 **20 Claims**



1. An interferoceiver comprising:

an input system for receiving one or more RF signals from a source and for applying the one or more RF signals to an RF signal train generator;

wherein the RF signal train generator comprises:

means, responsive to the input, for storing the one or more RF signals;

means for regenerating replicas of the one or more stored RF signals;

means for pairing the regenerated replicas; and

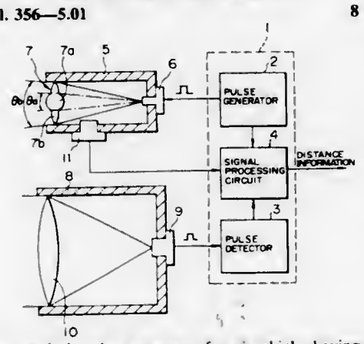
means for outputting the paired replicas.

5,589,930

OPTICAL RADAR APPARATUS

Akira Kurahashi, Kouta-cho; Hirosi Ando, Nichiharu-cho; Toshiyuki Kaneiwa, Kounan, and Yoshiaki Hoashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

PCT No. PCT/JP92/01151, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO93/06505, PCT Pub. Date Jan. 4, 1993
PCT Filed Sep. 9, 1992, Ser. No. 204,180
Claims priority, application Japan, Sep. 13, 1991, 3-234832
Int. Cl.[6] G01C *3/08;* **G03B** *3/00*
U.S. Cl. 356—5.01 **8 Claims**



1. An optical radar apparatus for a vehicle having a light transmitter for emitting a beam of light, from a front side of said vehicle toward an object, a light receiver for receiving reflected light from said object, and distance calculating means for calculating a distance to said object based on said beam of light and said reflected light, said light transmitter comprising:

an optical device including an n-focus lens (n is equal to or greater than 2) formed of at least a first focus portion having a first focal length and a second focus portion, first and second parts of which are respectively disposed on opposite sides of said first focus portion, said second focus portion having a second focal length longer than the first focal length, said first and second focus portions being disposed in an order of said first part of said second focus portion, said first focus portion, and said second part of said second focus portion, and disposed in one of a width and a height direction of said vehicle, from an edge of said n-focus lens to an opposite edge of said n-focus lens; and

a light source provided in a position at a distance equal to or shorter than the first focal length from said optical device, said light source emitting light to said optical device so that light is emitted toward said front side of said vehicle through said first focus portion and said second focus portion.

5,589,931

SYSTEM TO DETERMINE ENVIRONMENTAL PRESSURE AND BIREFRINGENT-BIASED CLADDED OPTICAL SENSOR FOR USE THEREIN

William R. Rapoport, and Janpu Hou, both of Bridgewater, N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

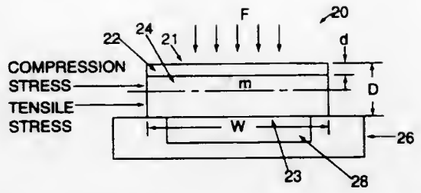
Filed Mar. 17, 1995, Ser. No. 406,331
Int. Cl.[6] G01B *11/16*
U.S. Cl. 356—33 **9 Claims**

1. A photoelastic sensor comprising:

a) a first photoelastic plate.

b) a second plate optically bonded to said first plate;

whereby light travels through said first plate via refractive index confinement and an application of force to said first plate results in said first and second plates to deform causing nonlinear stresses across the thickness of said first and second plates causing a



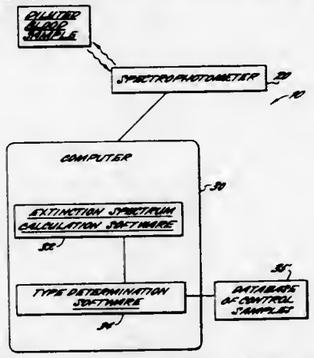
stress-induced birefringence resulting in components of said light to experience a phase delay proportional to said force.

5,589,932

SPECTROPHOTOMETRIC METHOD AND APPARATUS FOR THE CHARACTERIZATION OF BLOOD AND BLOOD TYPES

Luis H. García-Rubio, Temple Terrace; Manuel Bayona, Lutz; Robert Potter, and German Leparc, both of Tampa, all of Fla., assignors to University of South Florida, Tampa, Fla.

Filed Feb. 8, 1995, Ser. No. 385,717
Int. Cl.[6] G01N *33/48;* **A61B** *5/00;* **G06F** *15/00*
U.S. Cl. 356—39 **14 Claims**



9. An apparatus for determining the type of a blood sample, the apparatus comprising:

means for collecting a turbidity spectrum of the blood sample over a predetermined wavelength range;

means for calculating from the turbidity spectrum an extinction spectrum for the blood sample;

means for comparing the extinction spectrum with a set of control spectra collected from control blood samples, each control sample having a known blood type; and

means for determining from the comparison the type of the blood sample.

5,589,933

OPTICAL FIBER TEST INSTRUMENT WITH MECHANICALLY POSITIONED ATTENUATOR

Edwin B. Osgood, Beaverton, and Casey S. Shaar, Portland, both of Oreg., assignors to Photon Kinetics, Inc., Beaverton, Oreg.

Filed Oct. 24, 1994, Ser. No. 328,832
Int. Cl.[6] G01N *21/00;* **G02B** *26/02*
U.S. Cl. 356—73.1 **20 Claims**

1. An optical time domain reflectometer (OTDR), for launching pulses of light into an optical fiber under test at a proximal end thereof and measuring intensity of backscattered light returned to the proximal end of the optical fiber under test, the OTDR comprising:

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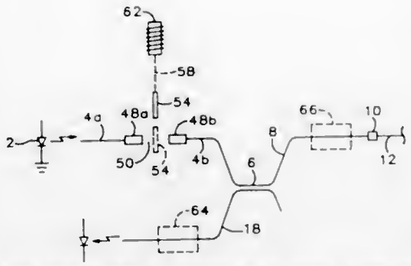


a light source means for emitting optical energy in response to electrical energy,

a detector for providing an electrical output signal in response to incident optical energy,

a propagation means defining a path for delivering optical energy from the light source means to the optical fiber under test, whereby optical energy is launched into the fiber under test, and for delivering optical energy from the optical fiber under test to the detector, at least one segment of the path defined by the propagation means being a segment in which the optical energy is propagated in free space as an unconfined beam, and said propagation means comprising at least a first optical fiber segment and a second optical fiber segment, the first and second optical fiber segments being separated across said one segment of the path,

an optical attenuator element, and

a positioning means for displacing the optical attenuator element between a first position, in which it is out of said path, and a second position, in which it is interposed in said one segment of the path.

5,589,934

LIGHT MEASURING APPARATUS CAPABLE OF MEASURING AMBIENT LIGHT AND FLASH LIGHT

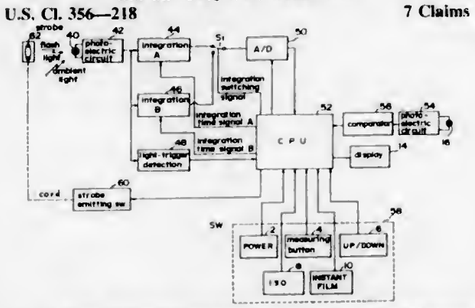
Norihisa Hosoi, Toyokawa; Susumu Shiral, Toyohashi; Kenichiro Hibi, Toyokawa; Yoshihiro Okui, Daitoh; Takehiro Katoh, Nara, and Yoshihiko Azuma, Kawasaki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jan. 5, 1995, Ser. No. 368,876

Claims priority, applicatioo Japan, Jan. 17, 1994, 6-002977

Int. Cl.[6] G01J *1/46;* **G03B** *15/05*

U.S. Cl. 356—218 **7 Claims**



1. A light measuring apparatus capable of measuring ambient light and flash light, comprising:

a photoelectric sensor to convert the light to be measured into an electric signal;

a manual operating member which is manually operated by the user to start light measurement;

a generating device to generate a flash light emission signal in response to the operation of said manual operating member and to transmit said flash light emission signal to the flash unit where the flash unit is connected to the apparatus using a cord;

a detecting device to detect the emission of flash light by monitoring a sudden change in the intensity of the light being measured;

an integration circuit to perform integration of electric signals output by said photoelectric sensor;

a control device to regulate said integration circuit such that said integration circuit performs integration twice at prescribed intervals in response to the operation of said manual operating member;

a first mode in which light measurement is conducted without any flash light emission;

a second mode in which the flash unit is connected to the apparatus using a cord and light measurement begins at the same time as the transmission of said flash light emission signal to the flash unit through the cord;

a third mode in which the flash unit is not connected to the apparatus and light measurement begins in response to the detection of flash light emission by said detecting device;

a determining device to determine the mode in which light measurement took place based on an electric signal output hy said photoelectric sensor; and

a calculator to calculate measurement values for the mode used based on the output from said integration circuit wherein said determining device compares the two outputs generated from said two integrations by said integration circuit and determines that light measurement took place in the first mode when the two outputs generated by said two integrations are almost equal, and wherein said calculator calculates measurement values for the first mode based on either of said two outputs from said integration circuit.

5,589,935

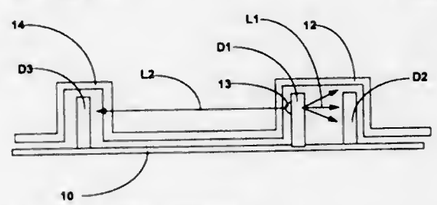
TURBIDITY SENSOR WITH THE CAPABILITY OF REGULATING THE INTENSITY OF A LIGHT SOURCE

James R. Biard, Richardson, Tex., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed May 25, 1995, Ser. No. 452,607

Int. Cl.[6] G01N *21/00;* **D06F** *33/00;* **B08B** *3/00*

U.S. Cl. 356—339 **4 Claims**



1. A turbidity sensor, comprising:

a light source;

a first light sensitive component, said light source and said first light sensitive component being spaced apart to provide a gap therebetween, said gap being shaped to permit a fluid to be disposed between said first light sensitive component and said light source, light from said light source being transmittable through said fluid for receipt by said first light sensitive component, the intensity of said light received by said first light sensitive component being indicative of the level of turbidity of said fluid;

a second light sensitive component, said second light sensitive component being disposed proximate said light source, said first and second light sensitive components being photodiodes;

means for preventing said fluid from interfering with the transmission of light from said light source to said second light sensitive component;

means for regulating the intensity of light received by a preselected one of said first and second light sensitive components from said light source to a predetermined magnitude, said regulating means comprising a means for regulating the intensity of light received by said first light sensitive component by controlling the magnitude of current flowing through said light source;

means for comparing a first signal from said first light sensitive component to a threshold magnitude; and

means for providing a second signal which is representative of the difference between said first signal and said threshold magnitude; and

means for controlling an electrical current provided to said light source as a function of said second signal.

5,589,936

OPTICAL MEASURING APPARATUS FOR MEASURING PHYSICHEMICAL PROPERTIES

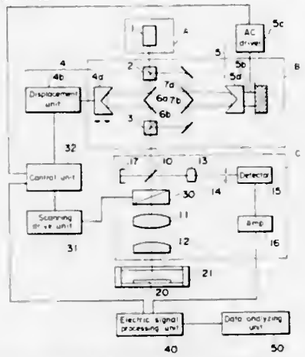
Kiyoshi Uchikawa, Tokyo; Takayuki Suga, and Akira Furusawa, both of Tsukuba, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 10, 1993, Ser. Nn. 120,874

Claims priority, application Japan, Sep. 14, 1992, 4-244637; Oct. 22, 1992, 4-284701; May 26, 1993, 5-123778; May 26, 1993, 5-123779

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **16 Claims**



1. An optical measuring apparatus comprising:

a laser beam source;

a light splitter for splitting light emitted from said laser beam source into two beams transmitting in different directions;

an optical delay unit disposed in an optical path of one of said beams outgoing from said light splitter;

a phase modulator disposed in an optical path of the other of said beams outgoing from said light splitter, for phase-modulating said other beam hy a predetermined frequency;

an optical mixer for mixing two beams respectively outgoing from said optical delay unit and from said phase modulator;

an illumination optical system for guiding a mixed beam outgoing from said optical mixer onto a specimen to form a light spot thereon;

a photodetector for detecting light from said specimen; and

signal processing means for extracting a modulation component with a frequency even times larger than the modulation frequency of said phase modulator from an output signal from said photodetector and detecting an intensity of optical echo depending upon an optical delay time set by said optical delay unit.

5,589,937

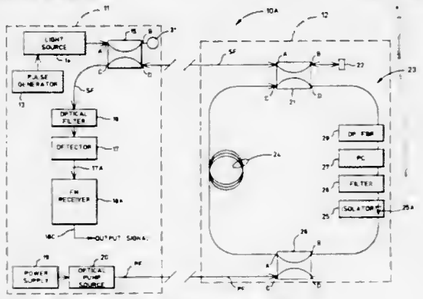
FIBER OPTIC SELF-MULTIPLEXING AMPLIFIED RING TRANSDUCER AND FORCE TRANSFER SENSOR WITH PRESSURE COMPENSATION

Michael R. Brininstool, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 339,992, Oct. 31, 1994, abandoned. This application May 2, 1995, Ser. No. 434,366

Int. Cl.[6] G01B *9/02;* **G01L** *1/24*

U.S. Cl. 356—352 **29 Claims**



1. A fiber optic sensor system, comprising:

a first optical power source for generating a light pulse;

an optical fiber loop system coupled to receive said light pulse, wherein said light pulse circulates in said optical fiber loop system at a circulation frequency, and which includes:

a transducer which modulates said circulation frequency in response to detecting a changing physical condition;

an optical fiber gain medium for amplifying said light pulse;

a second optical power source for providing optical energy to said optical fiber gain medium; and

a detector system for receiving a portion of said light pulse received from said optical fiber loop system and generating an output signal representing said circulation frequency.

5,589,938

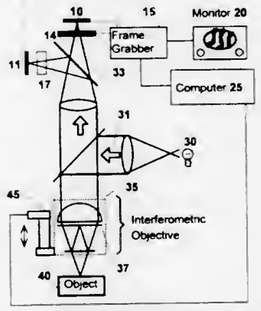
METHOD AND APPARATUS FOR OPTICAL INTERFEROMETRIC MEASUREMENTS WITH REDUCED SENSITIVITY TO VIBRATION

Leslie L. Deck, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Jul. 10, 1995, Ser. No. 499,969

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—359 **26 Claims**



1. A method for providing interferometric measurements having reduced sensitivity to vibration comprising the steps of:

amplitude splitting an interference pattern into a first and a second interferogram:

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imaging said first interferogram onto a first detector having a first data acquisition rate for acquiring a first data set of interferograms;

imaging said second interferogram onto a second detector having a second data acquisition rate for acquiring a second data set of interferograms, said second data acquisition rate being different than said first data acquisition rate, with said first data acquisition rate comprising a first frame rate for providing a first data set as said first data set and said second data acquisition rate comprising a slow frame rate for providing a slow data set as said second data set;

providing substantially identical frame integration periods which overlap in time said first and second detectors;

analyzing said first data set for phase for said interferograms in said fast data set and analyzing said first data set for phase at each image point on each frame of said fast data set;

determining a phase difference between said interferograms in said slow data set from said phases derived from said fast data set; and

analyzing said slow data set with said phase differences while accounting for non-equal phase separations between interferograms; wherein the phase separation between acquired interferograms may be dynamically measured while enabling correction of phase errors due to instrument inaccuracies and external vibrations calculating a phase increment between each frame in said slow data set using said fast data set using said fast data set phases and analyzing said low data set for phase at each image point using said calculated phase increments.

5,589,939

LASER SURVEYING SYSTEM

Eiichi Kitajima, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

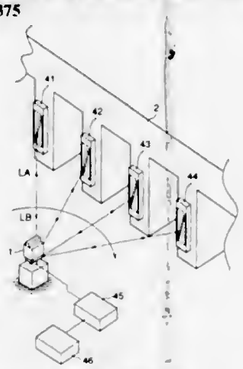
Continuation of Ser. No. 363,342, Dec. 23, 1994, abandoned.

This application Feb. 21, 1996, Ser. No. 604,294

Claims priority, application Japan, Dec. 28, 1993, 5-348925

Int. Cl.[6] G01B *11/00;* **G01C** *5/00*

U.S. Cl. 356—375 **14 Claims**



1. A laser surveying system comprising:

a light projector which projects a laser beam in a direction that rotates around a rotational axis and within a plane perpendicular to said rotational axis to sweep an object;

an angle detector to detect a rotational angle, at which said laser beam is being projected, substantially continuously throughout a sweep range of said laser beam;

a reflector to be provided on the object and including means for converting said laser beam into a reflected laser beam containing two-dimensional positional data; and

a light receiving unit which receives the reflected laser beam and generates an output indicating a three-dimensional position of the reflector based on the rotational angle detected by said angle detector and the two-dimensional positional data contained in the reflected laser beam.

5,589,940

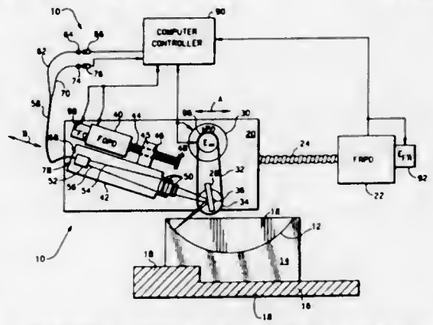
APPARATUS FOR MEASURING THE CURVATURE OF A SURFACE USING MOVEABLE REFLECTING AND FOCUSING ELEMENTS

Joerg W. Hollmann, Midland, Canada, assignor to Hughes Electronics, Los Angeles, Calif.

Filed Dec. 21, 1994, Ser. No. 361,260

Int. Cl.[6] G01B *11/24;* **G02B** *7/04;27/40*

U.S. Cl. 356—376 **22 Claims**



1. Apparatus for measuring the curvature of a surface of an object at a first position on the surface comprising:

a frame;

means for moving said frame relative to said object to provide a frame position signal;

light source means for providing incident light;

means disposed adjacent to said light source means for focussing said incident light said focussing means including means for transmitting light onto said reflecting means and means for receiving return light from said reflecting means and for transmitting return light to said light source means to provide a focus signal;

means disposed adjacent to said focussing means for reflecting said incident light onto said surface and for reflecting return light from said surface to said focussing means;

means for rotating said reflecting means to provide an angle position signal for the reflecting means;

means for moving said focussing means to provide a focus position signal; and

control means including a processor means for receiving said frame position signal, said angle position signal, said focus position signal, and said focus signal to calculate the curvature of said surface at said first position.

5,589,941

DEVICE FOR THE MEASUREMENT OF A PROFILE ON A PLANE SURFACE

Jacques Sabater, Gif Sur Yvette; Guy E. P. Tourtollet, Tencin, and Gérard Jayet, Oyeu, all of France, assignors to Centre Technique de L'Industrie des Papiers, Cartons et Celluloses, France

Filed Apr. 12, 1995, Ser. No. 421,053

Claims priority, application France, Apr. 12, 1994, 94 04672

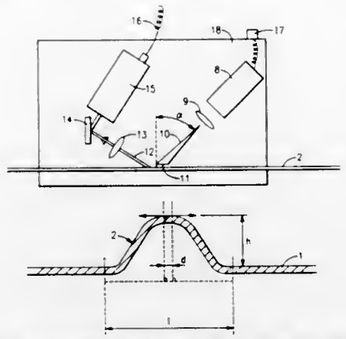
Int. Cl.[6] G01B *11/02*

U.S. Cl. 356—376 **11 Claims**

1. Apparatus for measuring a relief profile line contained upon a planar surface of a substrate that includes:

a hand-held measurement head that further includes,

a light source and a lens means for converting a beam of light emanating from said source into an image in the form of a luminous streak that is perpendicular to a relief profile line being measured wherein the orientation of said beam of light is effected at an angle of incidence (α) having a value about equal to the Brewster angle of the substrate,



means for focussing back-scattered light from the illuminated relief profile line upon a matrix camera which converts received analog light signals into digital output signals, and

processing means connected to said camera for processing said digital signals to determine at least one of the geometrical characteristics defining the relief profile line.

5,589,942

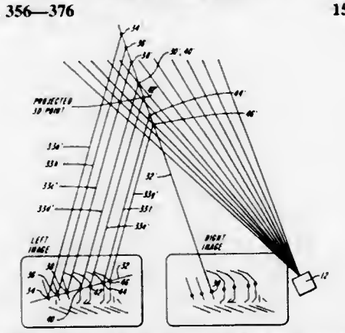
REAL TIME THREE DIMENSIONAL SENSING SYSTEM

Steven J. Gordon, Boston, Mass., assignor to Intelligent Automation Systems, Cambridge, Mass.

Filed Apr. 5, 1990, Ser. No. 505,722

Int. Cl.[6] G01B *11/24*

U.S. Cl. 356—376 **15 Claims**



1. A three dimensional object sensing apparatus comprising:

an electromagnetic radiation source for illuminating an object to be sensed with a plurality of electromagnetic radiation patterns,

first and second electromagnetic recording means for recording first and second images, respectively, of the reflection of said patterns off of said object as it is illuminated by said electromagnetic radiation source, wherein said first and second electromagnetic recording means are positioned in any manner relative to each other such that said first electromagnetic recording means records an image containing at least some of the reflected patterns which said second electromagnetic recording means records, and

data processing means for correlating the reflections of each of said patterns as recorded by said first recording means with the reflection of each of said patterns as recorded by said second recording means and determining the shape or position of said object therefrom,

wherein said data processing means comprises;

means for converting each of said images into a series of digital pixel words,

means for grouping said digital pixel words of each image into stripes, each stripe comprising the digital pixel words corresponding to points illuminated by a single one of said patterns,

means for selecting a single digital pixel word from each stripe from said first image, each of said selected digital pixel words representing a selected point on said object which is illuminated by the associated pattern,

means for determining an epipolar line in said second image associated with each of said selected digital pixel words,

means for determining each digital pixel word representing a point in said second image which is both part of a stripe in said second image and part of an epipolar line, said points termed intersection points,

means for determining the three dimensional coordinate of each of said intersection points,

means for selecting the single intersection point on each of said epipolar lines which lies closest to one of said patterns as the selected point from said first image associated with each of said epipolar lines, and

means for determining the shape or position of said object based on the known position of said selected points.

5,589,943

APPARATUS FOR RECORDING DIGITAL STILL IMAGE SIGNALS AND ANALOG STILL IMAGE SIGNALS IN RESPECTIVE RECORDING AREAS

Susumu Kozuki, Tokyo; Isao Harigaya, and Taizou Hori, both of Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

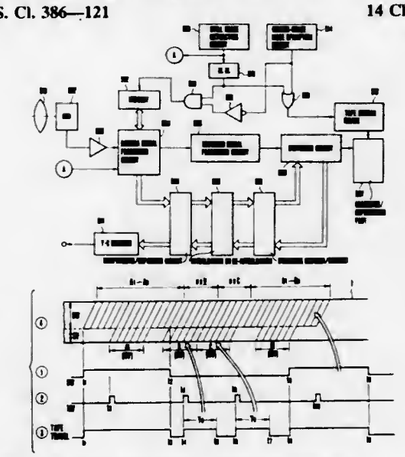
Continuation of Ser. No. 927,213, Aug. 6, 1992, abandoned.

This application Sep. 7, 1994, Ser. No. 303,122

Claims priority, application Japan, Aug. 20, 1991, 3-207829; Sep. 2, 1991, 3-221706; Oct. 21, 1991, 3-272626

Int. Cl.[6] H04N *5/76;5/225;5/78*

U.S. Cl. 386—121 **14 Claims**



10. A video signal recording apparatus, comprising:

(a) first recording means for recording a moving-image signal in first areas respectively provided in a multiplicity of tracks on a recording medium;

(b) second recording means for recording a digital still-image signal in second areas which are respectively separated from the first areas in the multiplicity of tracks; and

(c) controlling means for simultaneously controlling said first recording means and said second recording means;

said controlling means causing an analog still-image signal for one picture to be automatically recorded a plurality of times instead of the moving-image signal on the first areas correspondingly located the second areas on which the digital still-image signal is recorded once.

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5,589,944

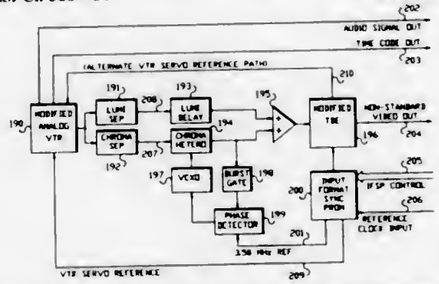
METHOD AND APPARATUS FOR GENERATING A VIDEO SIGNAL PRODUCING AN UNVIEWABLE DISPLAY FROM A VIDEOTAPE RECORDING THEREOF

Philip L. Young, 1548 County Rd. 59, Fremont, Ohio 43420, and Leonard H. Greenberg, 1147 Elm Ave., No. 204, Glendale, Calif. 91201

Continuation of Ser. No. 75,052, Jun. 10, 1993, abandoned. This application Nov. 2, 1994, Ser. No. 333,355

Int. Cl.[6] H04N *5/76; G11B 15/04; 19/04*

U.S. Cl. 386—84 **20 Claims**



1. An apparatus for generating a video signal program formed of a plurality of successive frames of video signal lines of information so as to produce an unviewable display from a videotape recording thereof while producing a normal picture on a video monitor comprising:

a source of a standard video waveform signal of program length having a standard number of lines of video information of a standard line length for each frame and a standard vertical rate at which successive frames of a standard frame length are generated to form the standard video waveform signal;

vertical rate modifying means connected to said source, said vertical rate modifying means being responsive to the standard video waveform signal for changing the standard vertical rate by a predetermined amount to generate an output video waveform signal having a constant non-standard frame rate; and

line number modifying means connected to said vertical rate modifying means, said line number modifying means being responsive to said output video waveform signal for changing the standard number of lines in each frame by a predetermined number to generate said non-standard video waveform signal of the program length having a non-standard number of lines of video information in each frame, said predetermined amount and said predetermined number being insufficient to interfere with a visual display of a normal picture from said non-standard video waveform signal by a video monitor used to display the standard video waveform signal and being sufficient to interfere with the visual display of a normal picture by the video monitor when said non-standard video waveform signal is recorded by a recording device adapted to record the standard video waveform signal and played back by the recording device to the video monitor thereby producing an unviewable display.

5,589,945

COMPUTER-THEMED PLAYING SYSTEM

Max Abecassis, 19020 NE 20 Ave., Miami, Fla. 33179

Division of Ser. No. 2,998, Jan. 11, 1993, Pat. No. 5,434,678. This application Sep. 13, 1994, Ser. No. 305,455

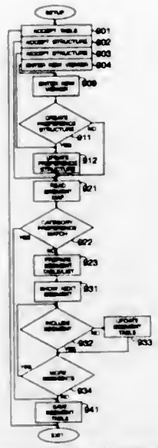
Int. Cl.[6] H04N *5/76; 7/10; 1/00*

U.S. Cl. 386—83 **12 Claims**

1. A method of retrieving video segments, comprising the steps of:

establishing video content preferences;

retrieving a video segment map directly defining a plurality of video segments of a video;



selecting video segments from said plurality of video segments responsive to an application of said video content preferences to said video segment map; and

coordinating a first retrieving means and a second retrieving means for retrieving video segments to retrieve the selected video segments and to seamlessly skip a retrieval of a non-selected video segment of said video producing a version of said video differing in length than the length of said video.

5,589,946

VIDEO SIGNAL REPRODUCTION APPARATUS REPLACING DROP-CUT SIGNAL PORTIONS

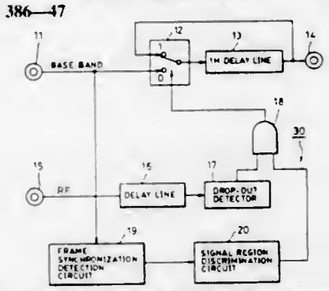
Makoto Shimokoriyama, Kawasaki; Akio Aoki, Tokyo, and Masato Kato, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1992, Ser. No. 890,181

Claims priority, application Japan, Jun. 7, 1991, 3-163885

Int. Cl.[6] H04N *5/94; 5/78*

U.S. Cl. 386—47 **18 Claims**



1. An apparatus for reproducing, from a recording medium, a composite signal in which an image signal and a non-image signal are multiplexed on a time axis, said apparatus comprising:

(a) reproduction means for reproducing the composite signal from the recording medium;

(b) detection means for detecting a drop-out portion of the composite signal reproduced by said reproduction means;

(c) discrimination means for generating a discrimination signal to discriminate between an image signal portion and non-image signal portions of the composite signal reproduced by said reproduction means; and

(d) replacing means for replacing the drop-out portion of the composite signal with a corresponding replacement signal, in response to (i) a detection of a drop-out portion by said detection means and (ii) the discrimination signal generated by said discrimination means,

wherein the composite signal is reproduced as synchronization blocks, in which at least one of the image signal portion and the non-image signal portions are arranged in each synchronization block, and said replacing means compensates for a drop-out image signal by using an image signal of the image signal portion in a synchronization block other than the synchronization block including the drop-out image signal.

5,589,947

KARAOKE SYSTEM HAVING A PLURALITY OF TERMINAL AND A CENTER SYSTEM

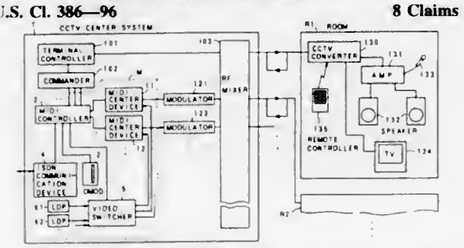
Masuhiro Sato, and Naoto Inaba, both of Tokyo-to, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 124,704, Sep. 21, 1993, abandoned. This application Nov. 28, 1994, Ser. No. 345,543

Claims priority, application Japan, Sep. 22, 1992, 4-252851

Int. Cl.[6] H04N *5/76;* **G10H** *7/00*

U.S. Cl. 386—96 **8 Claims**



1. A karaoke system comprising:

a plurality of terminal systems capable of respectively reproducing at the same time music and video images of music songs; and

a center system connected to the plurality of terminal systems, said center system comprising:

a unique musical performance information storage unit for storing digital performance information relating to music songs to be reproduced, said digital performance information including sequence data and reference data for each of the music songs, said sequence data including at least data relating to musical intervals, volume and words-of-song to be displayed on a monitor, said reference data including at least data relating to names of the music songs;

a musical performance information transmitter for transmitting the digital performance information, for each of the music songs, read out from the musical performance information storage unit to the plurality of terminal systems, said musical performance information transmitter reading out the digital performance information for a music piece in a time period shorter than an actual playing time of the music piece;

a video image storage unit for storing a plurality of video images distributed in accordance with kinds of music songs;

a video image generator for generating a video image from the video image storage unit according to the kind of music song; and

a video information transmitter for transmitting the generated video image to the plurality of terminal systems,

each of the plurality of terminal systems comprising:

a music information generator for generating analog music information of the music songs on the basis of the transmitted digital performance information;

a music information reproducer for reproducing the music information as musical sound;

a video image reproducer for reproducing the transmitted video images simultaneous with the music information; and

a video image mixer for generating a character image on the basis of the words-of-music data included in the digital performance information transmitted and superimposing the character image on the video images wherein said musical performance information transmitter transmits the digital performance information by a transmission frequency band different from that of the video information transmitter.

5,589,948

FACSIMILE APPARATUS

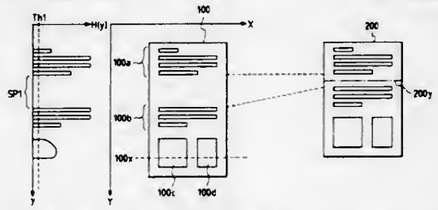
Toshiyuki Itezono, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1993, Ser. No. 125,197

Claims priority, application Japan, Sep. 25, 1992, 4-280498; Sep. 17, 1993, 5-255132

Int. Cl.[6] H04N *1/40*

U.S. Cl. 358—449 **12 Claims**



1. A facsimile apparatus comprising:

means for inputting an image signal representing an input image; and

substitution means for substituting an image area having consecutive main scan lines each containing no more than a predetermined amount of significant information of the input image which is longer than a first predetermined length by a predetermined image of a second predetermined length shorter than the first predetermined length in a direction of sub-scan to provide a substituted image;

record means for recording the input image on a cut sheet;

detection means for determining whether the length of the input image in the direction of sub-scan is longer than a third predetermined length corresponding to the length of the cut sheet in the direction of sub-scan or not; and

control means for conducting the substitution process when said detection means determines that the length of the input image in the direction of sub-scan is longer than the third predetermined length, and causing said record means to record the substituted image on the cut sheet when the length of the substituted image by said substitution means in the direction of sub-scan is not longer than the third predetermined length.

5,589,949

IMAGE PROCESSING APPARATUS

Masao Miyaza, Osaka, and Kenji Matsumoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 228,400, Apr. 15, 1994, Pat. No. 5,424,853. This application May 30, 1995, Ser. No. 453,900

Claims priority, application Japan, Apr. 19, 1993, 5-91567; May 25, 1993, 5-122780

Int. Cl.[6] H04N *1/393*

U.S. Cl. 358—451 **6 Claims**

1. An image processing apparatus comprising:

image input means for reading a document image;

magnification fetching means for fetching a magnification of the document image;

interval fetching means for fetching a specified interval on the document image;

dimension calculating means for calculating a dimension of the interval on the document image; and

combining means for combining the image data of the document image read by said image input means with a distance as

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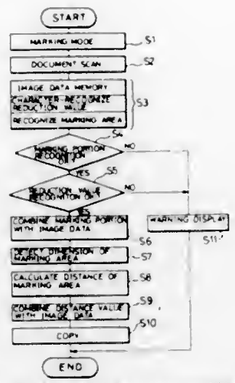


distance information which is represented by a value obtained by multiplying the dimension by the magnification.

5,589,950

IMAGE FORMING APPARATUS THAT CORRECTS INPUT GRAY LEVEL-OUTPUT GRAY LEVEL CHARACTERISTIC DATA SUCH THAT OUTPUT GRAY LEVELS GRADUALLY INCREASE WITH HIGHER INPUT GRAY LEVELS NEAR A BOUNDARY

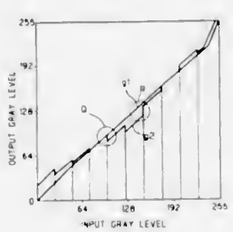
Masaya Fujimoto, and Haruo Yamamoto, both of Osaka, Japan, assignors to Mita Industrial, Co. Ltd., Osaka, Japan

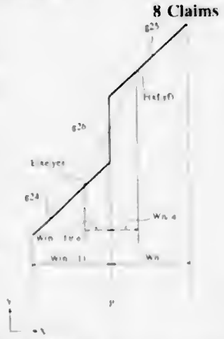
Filed Nov. 30, 1994, Ser. No. 352,088

Claims priority, application Japan, Dec. 3, 1993, 5-339496

Int. Cl.[6] H04N *1/40;1/46*

U.S. Cl. 358—455 **8 Claims**





1. An image forming apparatus comprising:

first storing means for storing input gray level-output gray level characteristic data which represent an output gray level relative to an input gray level;

a density processing section which receives input gray level-output gray level characteristic data from said first storing means, said density processing section including second storing means for storing input gray level-output gray level characteristic data transferred from said first storing means, and address generating means for generating addresses corresponding to said second storing means in response to input gray level data, said second storing means and said address generating means cooperating to supply output gray level data from an address in said second storing means when said address is specified by said address generating means;

inputting means for inputting characteristic correcting data, said characteristic correcting data providing input gray level-output gray level corrections corresponding to a plurality of division steps into which input gray levels are divided;

correcting means for correcting input gray level-output gray level characteristic data stored in said first storing means on the basis of characteristic correcting data supplied by said inputting means; and

reversal phenomenon correcting means for correcting, when there occurs at the boundary between adjacent steps such a reversal phenomenon that an output gray level in the step having relatively low input gray levels is higher than an output gray level in the step having relatively high input gray levels in input gray level-output gray level characteristic data obtained by the correction using said correcting means, said input gray level-output gray level characteristic data so that output gray levels gradually increase with higher input gray levels in the vicinity of the boundary.

said reversal phenomenon correcting means including

means for finding data of a point A at which a boundary line between the adjacent steps at which the reversal phenomenon occurs and a total output gray level characteristic line corresponding to the step having relatively low input gray levels which is represented by said input gray level-output gray level characteristic data obtained by the correction using the correcting means cross each other,

means for finding data of a point B at which the boundary line between the adjacent steps at which the reversal phenomenon occurs and a total output gray level characteristic line corresponding to the step having relatively high input gray levels which is represented by said input gray level-output gray level characteristic data obtained by the correction using the correcting means cross each other,

finding a point C having an output gray level equal to the output gray level of said point B on the total output gray level characteristic line corresponding to the step having relatively low input gray levels which is represented by said input gray level-output gray level characteristic data obtained by the correction using the correcting means,

finding a point D having an output gray level equal to the output gray level of said point A on the total output gray level characteristic line corresponding to the step having relatively high input gray levels which is represented by said input gray level-output gray level characteristic data obtained by the correction using the correcting means, and

means for finding a found straight line connecting said point C and said point D and changing the input gray level-output gray level characteristic data between the point C and the point D to characteristics represented by the found straight line.

5,589,951

PAD FOR USE IN SCANNING DATA STORED ON A FLAT SURFACE

Horst Woydich, Auf der Haid, 37, D-8190 Wolfratshausen, Germany

PCT No. PCT/EP92/01510, § 371 Date Jan. 4, 1994, § 102(e) Date Jan. 4, 1994, PCT Pub. No. WO93/01678, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 3, 1992, Ser. No. 175,341

Claims priority, application Germany, Jul. 4, 1991, 41 22 205.9; Oct. 29, 1991, 41 35 626.8

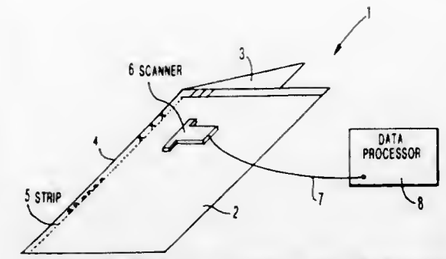
Int. Cl.[6] H04N *1/00;1/024*

U.S. Cl. 358—473 **14 Claims**

1. A device for scanning patterns from a surface of a pad, the device comprising in combination:

a scanner adapted to be manually moved over said surface to scan data from said patterns thereon;

a plurality of calibration marks, integrated in said pad and provided on said surface thereof and indicating image resolution parameters required for scanned patterns and being detectable by said scanner as said scanner is moved over said surface for immediate calibration of said scanner during a scanning process of said data so that the scanning process



may be controlled by a user comparing said calibration marks with image resolution parameters of said scanning process; and

guiding means detachably attached to said pad for guiding said scanner parallel and perpendicular to said calibration marks.

5,589,952

DISC HIGH RESOLUTION SCANNER

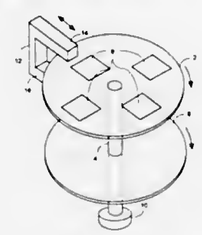
Yasushi Sato, Chiba, and Kaname Kamibayashi, Tokyo, both of Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

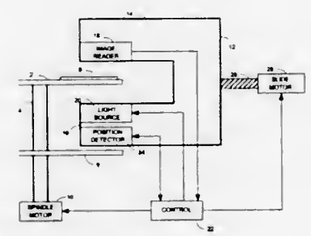
Filed Feb. 27, 1995, Ser. No. 395,121

Claims priority, application Japan, Mar. 18, 1994, 6-073899; Jun. 22, 1994, 6-162895; Oct. 31, 1994, 6-290529

Int. Cl.[6] H04N *1/08*

U.S. Cl. 358—487 **18 Claims**





1. A scanner apparatus comprising:

rotatable means having a first surface for mounting an original to be scanned and a second surface having a track;

means for rotating the rotatable mounting means;

a structure comprising a first arm disposed for reading the original on the first surface and a second arm disposed for accurately tracing the track on the second surface;

means for moving the structure radially with respect to the rotatable mounting means; and

means for controlling the rotating and moving means so that the first arm reads the original, the controlling means comprising means for regulating the rotating and moving means according to an output from the second arm so that the first arm reads the original at a high resolution.

5,589,953

IMAGE INPUT SYSTEM HAVING AN AUTO-FEEDER INCLUDING LOADING MAGAZINE AND DISCHARGE MAGAZINE ARRANGED SIDE BY SIDE AND METHOD

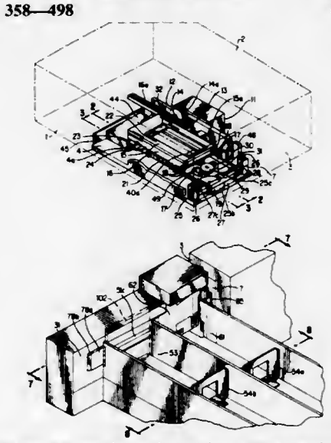
Masashi Tazawa; Nobuhiro Fujinawa; Kumiko Matsui, all of Kanagawa-ken, and Maki Suzuki, Chiba-ken, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 24, 1995, Ser. No. 427,230

Claims priority, application Japan, Jun. 24, 1994, 6-143542; Jun. 27, 1994, 6-144894; Jun. 27, 1994, 6-144931; Jun. 28, 1994, 6-146191; Jun. 28, 1994, 6-146202; Aug. 25, 1994, 6-200000

Int. Cl.[6] H04N *1/04*

U.S. Cl. 358—498 **40 Claims**



1. A feeder for use in an image input system adapted to be mounted on an image input device of said image input system, said feeder comprising:

a loading magazine storing source documents, a source document of said source documents being inserted from said loading magazine into said image input device for reading image data from said source document;

a discharge magazine storing source documents discharged from said image input device, wherein said loading magazine and said discharge magazine are positioned on one side of said image input device and in parallel and in side-by-side relationship within said feeder; and

a transport surface extending substantially perpendicular to an edge surface of said loading magazine and an edge surface of said discharge magazine.

5,589,954

γ-CORRECTION CURVE SELECTING APPARATUS AND A γ-CORRECTION CURVE CREATING APPARATUS

Hideyuki Watanabe, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 31, 1994, Ser. No. 251,312

Claims priority, application Japan, May 28, 1993, 5-127559

Int. Cl.[6] H04N *1/56;1/60*

U.S. Cl. 358—518 **7 Claims**

2. A γ-correction curve creating apparatus for creating a γ-correction curve for each color component in order to convert the density value for each color component obtained by color-dissolving the color image for each pixel by use of a predetermined color dissolving apparatus, comprising:

achromatic color density estimating means for estimating the density value for each color component when said predetermined color image processing apparatus outputs achromatic color;

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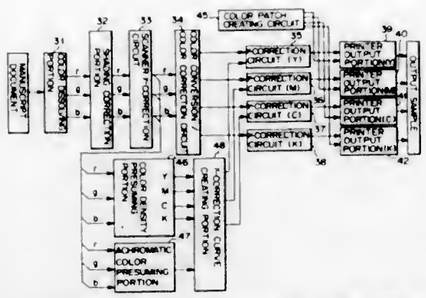


γ-characteristic estimating means for estimating the γ-characteristic value of said image processing means for each color component in said predetermined color image processing apparatus; and

γ-correction curve creating means for creating the γ-correction curve from the γ-characteristic value emitted from said γ-characteristic estimating means and the density value for each color component of said achromatic color estimating means.

5,589,955

OPTICAL DEVICE AND OPTICAL MACHINING SYSTEM USING THE OPTICAL DEVICE

Jun Amako; Hirotsuna Miura, and Tomio Sonehara, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

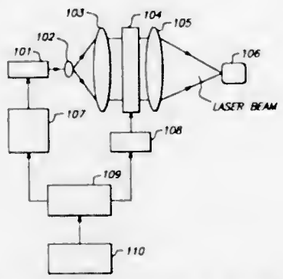
Continuation of Ser. No. 965,276, Jan. 21, 1993, abandoned.

This application Mar. 18, 1993, Ser. No. 33,217

Claims priority, application Japan, May 21, 1991, 3-116058; May 24, 1991, 3-120383; May 7, 1992, 4-114479; May 14, 1992, 4-122136

Int. Cl.[6] G03H *1/08*

U.S. Cl. 359—9 **11 Claims**



1. An optical device for reproducing an original image pattern on a subject material, the original image pattern being represented by original image pattern data, the optical device, comprising:

a coherent light source that emits a light having a wavefront;

rewritable spatial light modulation means for controlling the wavefront of the light emitted from said light source to produce a plurality of image patterns on the subject material for reproducing the original image; and

electric processing means for generating a plurality of computer hologram data groups and for sequentially supplying the computer hologram data groups to said rewritable spatial light modulation means, said electric processing means including:

means for receiving and storing the original image pattern data,

means for generating a plurality of random phase distribution data groups,

means for multiplying the original image pattern data by each group of the random phase distribution data to produce, respectively, a plurality of data sets, and

means for converting the plurality of data sets produced from said multiplying means to a plurality of computer hologram data groups, respectively, with each computer hologram data group representing one image frame;

wherein the random phase distribution data groups are statistically uncorrelated one another;

wherein said electric processing means supplies the plurality of computer hologram data groups to said rewritable spatial light modulation means on a group-by-group basis, so that the image frames as represented by the computer hologram data groups are supplied to said rewritable spatial light modulation means on a frame-by-frame basis;

wherein said rewritable spatial light modulation means produces and projects an image pattern on the subject material on a pattern-by-pattern basis for each computer hologram data group received from said electric processing means, so that a plurality of image patterns are projected in a series manner and are superposed and integrated at a substantially same location on the subject material to reproduce the original image pattern.

5,589,956

IMAGE DISPLAY APPARATUS

Hideki Morishima, Tokyo; Susumu Matsumura, Kawaguchi; Naosato Taniguchi; Yoko Yoshinaga, both of Machida; Shin Kobayashi, Atsugi; Toshiyuki Sudo, Kawasaki, and Tadashi Kaneko, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

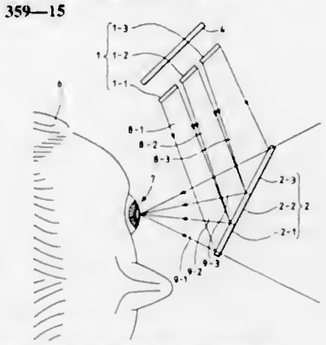
Continuation of Ser. No. 102,995, Jul. 28, 1993, abandoned.

This application Apr. 4, 1996, Ser. No. 626,901

Claims priority, application Japan, Jul. 31, 1992, 4-224869

Int. Cl.[6] G02B *5/32*

U.S. Cl. 359—15 **15 Claims**



1. An image display apparatus comprising:

a plurality of image display elements; and

a hologram optical element provided with a plurality of elementary hologram optical elements having an optical power corresponding to said plurality of image display elements, wherein

each of said elementary hologram optical elements diffracts light from a corresponding one of said image display elements, said plurality of diffracted light traveling to a single pupil of an observer positioned at a predetermined position with respect to said hologram optical element, so that a virtual image by each said image display element is formed on the same virtual image plane to allow the observer to observe the virtual image as a single continuous virtual image.

5,589,957

STEREOSCOPIC DISPLAY APPARATUS USING CYLINDRICAL SCREEN

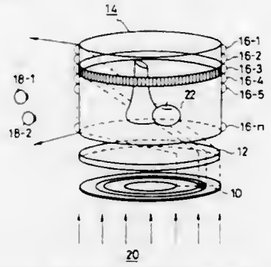
Hirokazu Aritake; Masayuki Kato, and Masato Nakashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 3, 1995, Ser. No. 383,427

Claims priority, application Japan, Mar. 15, 1994, 6-042989

Int. Cl.[6] G03H *1/26;* **G02B** *27/46*

U.S. Cl. 359—23 **20 Claims**



1. A stereoscopic display apparatus comprising:

a phase distribution display section for recording a holographic phase pattern to stereoscopically display on a plane, for applying a light modulation according to said holographic phase pattern to an incident light, and for emitting the modulated light;

an optical section for forming an image of the light modulated by said phase distribution display section onto a curved screen surface; and

a light diffusing section for diffusing in one direction the light formed as an image on said curved screen surface;

wherein said optical section deflects the light modulated by said phase distribution display section onto said curved screen surface and, after that, forms the image;

wherein said optical section has a 0-th order light eliminating section for eliminating a 0-th order light which is generated upon modulation by said phase distribution display section.

5,589,958

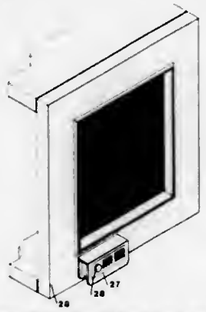
KITCHEN ENSEMBLE HAVING WINDOWS WITH CONTROLLABLE OPACITY

Joseph A. Lieb, 311 Wynne La., Narberth, Pa. 19072

Filed Feb. 9, 1995, Ser. No. 386,170

Int. Cl.[6] G02F *1/13;1/1333;* **A47F** *3/00;3/06*

U.S. Cl. 349—16 **32 Claims**



1. A kitchen ensemble having at least one appliance and at least one cabinet, said at least one appliance having a window and said at least one cabinet having a window, the appliance and cabinet defining interior regions and a common exterior region, the windows being permanently exposed to said common exterior region, said windows being made of a material of controllable opacity, wherein said windows are substantially clear in a first state and substantially opaque in a second state, and means for changing the states of said windows.

5,589,959

OPTICAL MODULATION DEVICE HAVING A POLYMER NETWORK CONTAINING FREE MOLECULES OF A CHIRAL LIQUID CRYSTALLINE MATERIAL

Rifat A. M. Hikmet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

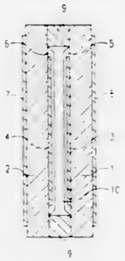
Continuation of Ser. No. 113,546, Aug. 27, 1993, abandoned.

This application Sep. 28, 1995, Ser. No. 534,772

Claims priority, application European Pat. Off., Sep. 1, 1992, 92202635

Int. Cl.[6] G02F *1/1333;1/13*

U.S. Cl. 349—88 **7 Claims**



1. A shock resistant optical modulation device capable of passively maintaining gray levels, comprising:

two substrates, at least one electrode on each substrate, and an optically active layer located between said two substrates, the optically active layer comprising a liquid crystalline material having ferroelectric, anti-ferroelectric or electroclinic properties, and a permanently oriented anistropic network of polymerized material containing free molecules of a chiral liquid crystalline material.

5,589,960

LIQUID CRYSTAL DISPLAY SYSTEM

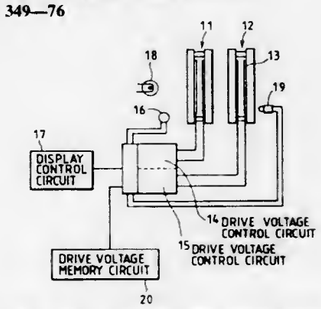
Masao Chiba, and Mikio Ishii, both of Saitama, Japan, assignors to Kansei Corporation, Saitama, Japan

Filed Dec. 20, 1994, Ser. No. 359,453

Claims priority, application Japan, Dec. 20, 1993, 5-319781; Mar. 1, 1994, 6-031349

Int. Cl.[6] G02F *1/133;1/1335*

U.S. Cl. 349—76 **7 Claims**



1. A double-layer type super-twisted nematic liquid crystal display system comprising:

a dot-matrix type liquid crystal display device for displaying at least one of characters and graphic forms;

a compensating liquid crystal device, which has transparent electrodes for retardation adjustment, for compensating an optical phase of said liquid crystal display device;

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a display control circuit for causing said liquid crystal display device to display at least one of characters and forms;

a temperature sensor for detecting a temperature of an atmosphere in which said liquid crystal display device and said compensating liquid crystal device are set, to provide an initial optimum value range for one or more drive voltages;

light detecting means for measuring and calculating a display contrast of said liquid crystal display device;

at least two drive voltage control circuits for controlling said drive voltages, said drive voltages applied to said liquid crystal display device and said compensating device; and

a displaying light source,

wherein said liquid crystal display device and said compensating liquid crystal device are driven with said drive voltages which are adjusted according to the calculation of contrast made with the aid of said light detecting means.

5,589,961

OPTICAL WAVE GUIDE DRIVEN LIQUID CRYSTAL DISPLAY EMPLOYING OPTICAL SWITCHING FOR INPUT

Mitsuhiro Shigeta, Kyoto, and Keisaku Nonomura, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

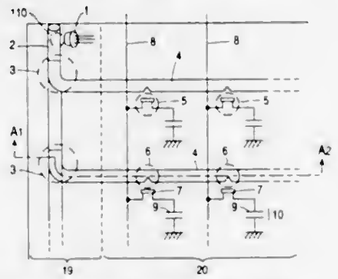
Division of Ser. No. 43,477, Apr. 7, 1993, Pat. No. 5,455,883.

This application May 24, 1995, Ser. No. 449,664

Claims priority, application Japan, Apr. 7, 1992, 4-85428; Apr. 5, 1993, 5-78377

Int. Cl.[6] G02F *1/1343*

U.S. Cl. 349—41 **7 Claims**



1. A liquid crystal display apparatus comprising:

a display medium;

a plurality of pixel electrodes arranged in row and column directions for driving said display medium;

a plurality of signal lines arranged in the row or column direction;

a plurality of photoconductors having photoconductive portions provided for said plurality of pixel electrodes, respectively, said photoconductors functioning to connect or disconnect said signal lines to or from said pixel electrodes in accordance with an optical signal which illuminates said photoconductive portions; and

an optical input device, a part of said optical input device being disposed in a direction across said plurality of signal lines, said optical input device allowing said optical signal to selectively illuminate said photoconductive portions of said plurality of photoconductors,

wherein said optical input device includes:

a transparent substrate;

a plurality of optical wave guides formed in a surface portion of said transparent substrate;

an optical input portion provided at one end of said optical wave guide;

a plurality of optical switch elements provided with said plurality of optical wave guides, respectively; and

a plurality of optical output portions for connecting a side face of said optical wave guide to a suffice of said transparent substrate; and

wherein said plurality of switch elements optically connecting one of said plurality of optical wave guides selectively,

said optical signal input from said optical input portion is transmitted through said one of optical wave guide and output from said optical output portions to the outside of said transparent substrate, said optical signal illuminating said photoconductive portions of said plurality of photoconductors, respectively.

5,589,962

ACTIVE MATRIX DISPLAY DEVICE USING ALUMINUM ALLOY IN SCANNING SIGNAL LINE OR VIDEO SIGNAL LINE

Hideaki Yamamoto, Tokorozawa; Haruo Matsumaru, Tokyo; Tetsuaki Suzuki, Mobara; Mitsuo Nakatani, Mobara; Michio Tsukii, Mobara; Akira Sasano, Tokyo; Saburo Oikawa, Hitachi, and Ryoji Oritsuki, Chiba-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

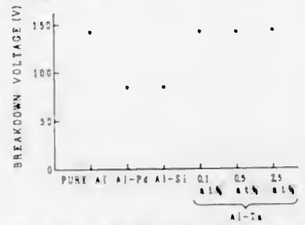
Continuation of Ser. No. 72,966, Jun. 8, 1993, abandoned.

This application Jun. 6, 1995, Ser. No. 467,967

Claims priority, application Japan, Jun. 8, 1992, 4-147120

Int. Cl.[6] G02F *1/136*

U.S. Cl. 349—46 **1 Claim**



1. An active matrix display device comprising a plurality of pixels arranged in a matrix, each of said pixels having a pixel electrode and a thin film transistor,

said thin film transistor including:

a gate electrode electrically connected to a scanning signal line;

a first insulating film formed on said gate electrode;

a semiconductor layer formed above said first insulating film;

a source electrode formed on said semiconductor layer and electrically connected to said pixel electrode; and

a drain electrode formed on said semiconductor layer and electrically connected to a video signal line,

wherein each of said scanning signal line and said gate electrode is made of an alloy of Al containing Ta and Ti, and a second insulating film formed of an anodized oxide film of said scanning signal line or said gate electrode is formed on the surface of at least one of said scanning signal line and said gate electrode.

5,589,963

PIXELATED COMPENSATORS FOR TWISTED NEMATIC LIQUID CRYSTAL DISPLAYS

William J. Gunning, III, 3924 Calle Valle Vista, Newbury Park, Calif. 91320; Bruce K. Winker, 4438 Sugar Maple Ct., Moorpark, Calif. 93021, and Gene C. Koch, 3090 Deerfield Dr., NE., Swisher, Iowa 52338

Filed Sep. 30, 1994, Ser. No. 313,509

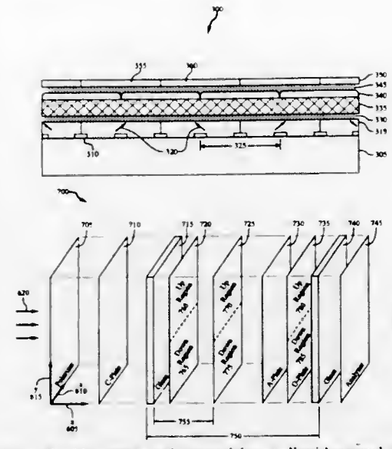
Int. Cl.[6] G02F *1/1335;1/1337*

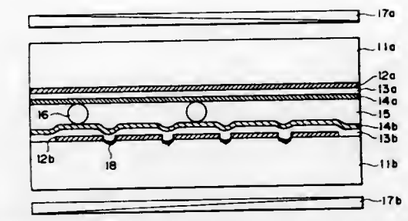
U.S. Cl. 349—119 **13 Claims**

1. A twisted nematic liquid crystal display comprising:

(a) a polarizer layer;

(b) an analyzer layer;





(c) a liquid crystal cell comprising a liquid crystal material disposed between said polarizer layer and said analyzer layer;

(d) said liquid crystal cell being defined by an optically transparent active matrix substrate and an optically transparent color filter substrate;

(e) said liquid crystal cell comprising a plurality of pixels;

(f) each said pixel comprising a pair of oppositely oriented liquid crystal tilt domains;

(g) each said tilt domain being defined by a liquid crystal alignment region on said active matrix substrate and a liquid crystal alignment region on said color filter substrate;

(h) a positively birefringent O-plate compensator layer having a plurality of segments, said segments on an interior surface of one of said optically transparent substrates, each said segment corresponding to a respective liquid crystal tilt domain and having an optical configuration that is optimized for that liquid crystal tilt domain;

(i) a first positively birefringent A-plate compensator layer disposed between said liquid crystal material and said O-plate compensator layer; and

(j) a second positively birefringent A-plate compensator layer disposed between one of said optically transparent substrates and said polarizer.

5,589,964

FERROELECTRIC LIQUID CRYSTAL DEVICE WITH MINUTE CONVEXITIES BETWEEN ADJACENT ELECTRODES

Yoshio Hotta; Yukio Hanyu, both of Atsugi; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa, and Katsutoshi Nakamura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 8,607, Jan. 22, 1993, Pat. No. 5,467,209.

This application Apr. 27, 1995, Ser. No. 431,564

Claims priority, application Japan, Jan. 24, 1992, 4-011025; Jan. 24, 1992, 4-032861

Int. Cl.[6] G02F *1/141;1/1333*

U.S. Cl. 349—160 **8 Claims**

1. A ferroelectric liquid crystal device, comprising: a pair of substrates each having thereon a group of stripe-shaped electrodes, and a ferroelectric liquid crystal disposed between the substrates, wherein a groove having minute convexities is formed between neighboring stripe-shaped electrodes on a substrate, and the neighboring stripe-shaped electrodes on the substrate extend in a direction which forms an angle of 45–135 degrees with a normal to smectic layers of the liquid crystal.

5,589,965

WIDE VIEWING-ANGLE DYE-DOPED TN LCD WITH RETARDATION FILMS

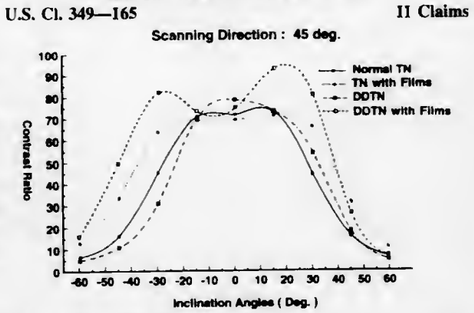
Birendra Bahadur, Etobicoke, and Kam H. Wan, Mississauga, both of Canada, assignors to Litton Systems (Canada) Limited, Ontario, Canada

Filed Jun. 23, 1994, Ser. No. 264,300

Claims priority, application Canada, Jun. 24, 1993, 2099642

Int. Cl.[6] G02F *1/1335;* **C09K** *19/60*

U.S. Cl. 349—165 **11 Claims**



1. A liquid crystal display, comprising:

a) a cell containing twisted nematic liquid crystal having a predetermined percentage of black dichroic dye mixed therein for maximizing contrast ratio at a 90° scanning direction to said cell;

b) a first polarizer adjacent one side of said cell and having a first polarization axis;

c) a second polarizer adjacent an opposite side of said cell and having a second polarization axis approximately parallel to said first polarization axis; and

d) a pair of retardation films intermediate said cell and said second polarizer, said pair of retardation films having respective slow axes thereof oriented at predetermined angles to said first polarization axis for maximizing contrast ration at –45° and +45° scanning directions to said cell.

5,589,966

ANTIFERROELECTRIC LIQUID CRYSTAL LIGHT MODULATION DEVICE

Hideo Hama, and Yukari Sakai, both of Sodegaura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 3, 1994, Ser. No. 237,120

Claims priority, application Japan, May 11, 1993, 5-109512

Int. Cl.[6] G02F *1/141;1/1347*

U.S. Cl. 349—194 **4 Claims**

1. A liquid crystal element consisting of

at least one liquid crystal cell, each liquid crystal cell comprising

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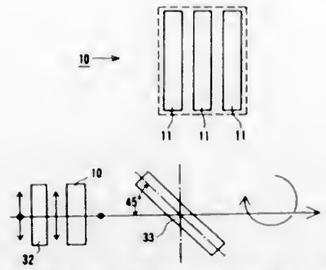


a pair of spaced apart transparent substrates, each of said substrates having laminated thereon in the following order,

a transparent electrode and

a transparent orientation control film, and

an antiferroelectric liquid crystal material layer sandwiched between said orientation control films; and

voltage signal input means electrically connected with each of said transparent electrodes;

wherein the polarization direction of a linear polarized monochromatic light transmitted by the liquid crystal element changes by approximately 90° when a given voltage signal is input to the liquid crystal element from the voltage signal input means; and

wherein the antiferroelectric liquid crystal material layer is formed from liquid crystal molecules having a tilt angle of 21° to 24°,

the thickness d (μm) of the antiferroelectric liquid crystal material layer contained in the liquid crystal cell for forming the liquid crystal element satisfies the following formula:

$$d=\lambda/2(n_e-n_o)$$

wherein n_e is a refractive index of the liquid crystal molecule of the antiferroelectric liquid crystal material layer in the major axis direction in the case where the given voltage signal is input to the liquid crystal element, n_o is a refractive index of the liquid crystal molecule of the antiferroelectric liquid crystal material layer in the minor axis directions in the above case, and λ (μm) is a wavelength of a light incident on the liquid crystal element, said λ is in the range of 0.4 to 0.7 μm, and d is in the range of 1.5 to 4 μm, with the proviso that when the liquid crystal element has more than one antiferroelectric liquid crystal material d is the total thickness of the antiferroelectric liquid crystal material layers;

said device further comprising a linear polarization plate placed at the light incidence side of said liquid crystal element, and

optionally, a ¼ wave plate placed on the light outgoing side of the liquid crystal element.

5,589,967

METHOD AND DEVICE FOR TRANSMITTING AND SWITCHING PACKETS IN AN OPTICAL NETWORK

René Auffret, Perros Guirec, France, assignor to France Telecom Etablissement Autonome de Droit Public, Paris, France

Filed Dec. 27, 1994, Ser. No. 364,089

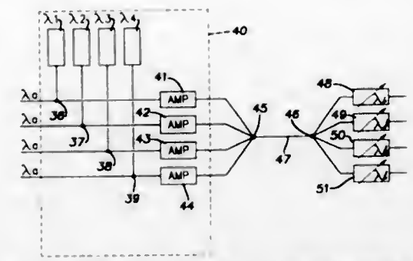
Claims priority, application France, Jan. 7, 1994, 94 00114

Int. Cl.[6] H04J *4/00; 14/00*

U.S. Cl. 359—123 **2 Claims**

1. Device for transmitting and switching packets in an optical network, said device including a transposer, said transposer comprising:

N 2 to 1 optical couplers, a first input branch of each coupler receiving a tributary signal at a wavelength λA, a second input branch of each coupler receiving a continuous emission of a coloring laser at a wavelength λi, an output of each optical coupler being transmitted to one of N first semiconductive optical amplifiers, an output of each of said first



semiconductive optical amplifiers comprising a signal at the wavelength λA and a complementary signal at the wavelength λi;

an N to 1 mixer which receives said outputs of said first semiconductive optical amplifiers, said mixer having an output;

an optical fiber connecting said mixer output to a i to N coupler, said 1 to N coupler having N outputs, each output of said 1 to N coupler having a rejecting filter which eliminates the wavelength λA; and,

synthesizer/transposers which function as a tuneable laser and a transposer amplifier, each of the synthesizer/transposers includes an optical fiber loop comprising a second semiconductive optical amplifier, an optical isolator, and a tuneable Fabry Perot filter, and wherein a residual reflectivity of each of the second optical amplifiers is such that said second optical amplifiers generate a modulation of a spectrum of a spontaneous emission, and each of said optical fiber loops define a laser which emits the wavelength λi (i=1 to N) each time the filter coincides with a resonance of the spontaneous emission.

5,589,968

MODE-LOCKED DIODE LASER BASED OPTICAL COMMUNICATION SYSTEM

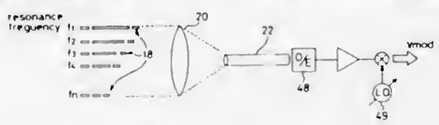
Paul May, Abingdon, United Kingdom, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

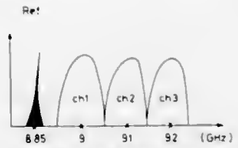
Continuation of Ser. No. 947,122, Sep. 17, 1992, abandoned. This application Jan. 27, 1995, Ser. No. 380,248

Claims priority, application United Kingdom, Sep. 20, 1991, 9120117

Int. Cl.[6] H04J *14/02;* **H04B** *10/04*

U.S. Cl. 359—124 **6 Claims**





1. An optical communication system comprising means for generating a plurality of signal carrying sub-carrier channels on respective carriers, each sub-carrier channel being a different respective frequencies each separated from the frequencies of all other said channels by respective predetermined intervals, means for providing a reference sub-carrier on a respective carrier having an intermediate reference frequency such that intervals between the reference sub-carrier frequency and each of the respective signal carrying sub-carrier channel frequencies are distinguishable from each of the predetermined intervals, and means for mixing said

reference sub-carrier with said signal carrying sub-carrier channels to provide difference signals.

5,589,969

WAVELENGTH DIVISION MULTIPLEXED OPTICAL FIBER TRANSMISSION EQUIPMENT

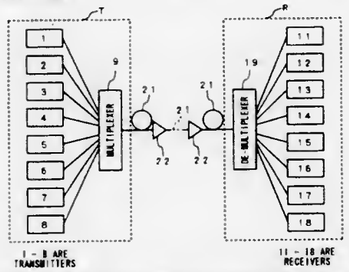
Hidenori Taga, Saitama; Noboru Edagawa, Tokyo; Noriyuki Takeda; Shu Yamamoto, both of Saitama-ken, and Shigeyuki Akiba, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1995, Ser. No. 542,058

Claims priority, application Japan, Mar. 15, 1995, 7-083429

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—124 **5 Claims**



1. A wavelength division multiplexed optical fiber transmission equipment for transmitting a plurality of signals having different wavelengths by multiplexing the wavelengths, the equipment comprising a WDM optical transmitting terminal including five or more optical transmitters for outputting signals wherein the spacing between the wavelengths of two first signals is re-used as the spacing between the wavelengths of two other signals separated from said first signals by two or more signal wavelengths and there is no periodicity in channel spacings.

5,589,970

LOCKING APPARATUS FOR OPTICAL FREQUENCY MULTIPLEX SYSTEM

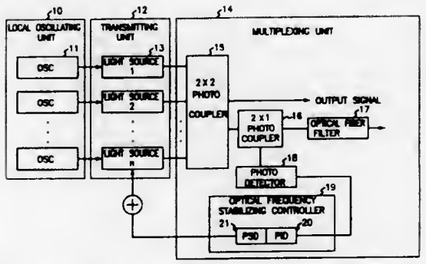
Gap Y. Lyu, and Chang S. Park, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, and Telecommunication Authority, both of Rep. of Korea

Filed Apr. 14, 1995, Ser. No. 422,055

Claims priority, application Rep. of Korea, Dec. 2, 1994, 1994-32595

Int. Cl.[6] H04B *10/00;* **H04J** *14/02*

U.S. Cl. 359—133 **8 Claims**



1. A locking apparatus for an optical frequency multiplex system having a plurality of light sources, comprising:

local oscillating means for applying low frequency signals to individual light sources for making center frequencies of the light sources dither;

photocoupler means for grouping dithering optical signals outputted from the light sources into a single signal;

resonating means for respectively aligning the dithering optical signals coupled by the photocoupler means with optical frequency slots, the resonating means producing a reflection optical signal from an input portion of the resonating means, the reflection optical signal being received by the photocoupler means;

photodetecting means for converting the reflection optical signal applied by the photocoupling means into a photodetector signal; and

optical frequency stabilizing control means for controlling the light sources on the basis of the photodetector signal received from the photodetecting means.

5,589,971

Patent Not Issued For This Number

5,589,972

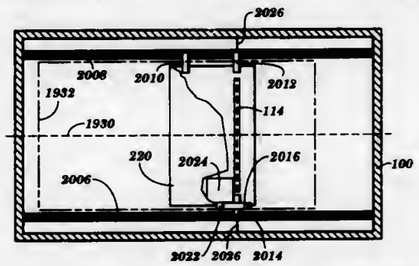
SCANNER DRIVE SYSTEM HAVING MINIMUM ROTATIONAL ERROR CARRIAGE SUSPENSION

Mark E. Tellam, Charlestown, Mass.; Mark G. Brook, Londonderry, N.H.; Kevin J. Haded, Chelmsford, and Joseph A. Wheeler, Gloucester, both of Mass., assignors to AGFA Division, Bayer Corporation, Wilmington, Mass.

Continuation of Ser. No. 496,484, Jun. 29, 1995. This application Feb. 12, 1996, Ser. No. 600,392

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—196 **10 Claims**



1. A system for scanning an original document to obtain a digitized representation of said original document, said scanning system comprising:

(A) An object focal plane;

(B) Scanning means, movably disposed for linear motion along a scanning axis, for illuminating a scan line of an original document located in said object focal plane, and for obtaining a digitized representation of said scan line;

(C) Means for moving said scanning means along said scanning axis to obtain digitized representations of successive scan lines of said original document, said digitized representations of said successive scan lines together comprising said digital representation of said original document; and,

(D) Means for suspending said scanning means along an axis of rotation substantially parallel to, and coincident with, said scan line.

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5,589,973

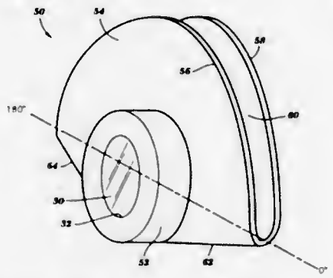
OPTICAL ENCLOSURE FOR HIGH SPEED ROTATING BEAM DEFLECTOR

Gregg R. King, Londonderry, N.H.; John A. Morrell, Wakefield, Mass.; Lawrence S. Blake, Peabody, Mass.; Philip A. Rombult, Bradford, Mass., and Thomas K. Hebert, Groveland, Mass., assignors to AGFA Division, Bayer Corporation, Wilmington, Mass.

Filed May 16, 1994, Ser. No. 243,677

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—214 **8 Claims**



1. An optical scanning device comprising:

a. optical means;

b. rotation means for rotating said optical means about a spin axis;

c. enclosure means surrounding said optical means for reducing imaging artifacts on scanned output from said optical scanning device, comprising a non-rotating hollow shield having entrance aperture means for allowing a light beam to enter said hollow shield and project onto said optical means, and exit aperture means for allowing the light beam to exit said hollow shield, said hollow shield having a substantially cylindrical body with a first end and a second end, and a longitudinal axis parallel to the spin axis of said optical means, said entrance aperture means provided at the first end of the cylindrical body with the longitudinal axis passing therethrough, said exit aperture means comprising a radial slot in a peripheral portion of said cylindrical body, said hollow shield mounted to said rotation means at the second end of said cylindrical body; and

d. a hollow fan-like portion extending radially outward from said slot in said peripheral portion of said cylindrical body, comprising two fan-like members attached to opposing sides of said slot and extending outward therefrom in planes substantially parallel to the beam exiting said slot and extending substantially away from said cylindrical body thereby enclosing the beam exiting the slot between the two fan-like members of the hollow fan-like portion as the beam is rotated through an angle by said optical means.

5,589,974

MICROMECHANICAL MODULATOR

Keith W. Goossen, Aberdeen, and James A. Walker, Howell, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 187,676, Jan. 27, 1994, Pat. No. 5,500,761. This application Jun. 7, 1995, Ser. No. 479,476

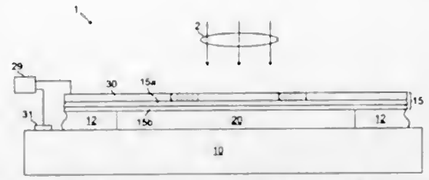
Int. Cl.[6] G02B *26/00*

U.S. Cl. 359—290 **20 Claims**

1. A modulator for modulating an optical signal, the optical signal being comprised of at least one wavelength, comprising:

a substrate characterized by a refractive index;

a membrane having an optically transparent portion and comprising at least a first layer of material having a refractive index which is approximately equal to the square root of the refractive index of the substrate and a thickness approximately equal to one-quarter of a wavelength of the optical signal, as measured within the first layer;



a means for supplying bias to the membrane and substrate; and

a flexible support for positioning the membrane in a spaced and superposed relation to the substrate defining an air gap having a variable size; wherein, in the absence of bias, the membrane has a first position and the air gap has a first size and, under the action of bias, the membrane moves to a second position and the air gap has a second size which is approximately an integer multiple of one-quarter of a wavelength of the optical signal, as measured in air, and wherein the size of the air gap when the membrane is in its first position is such that the difference between the first size and the second size is less than one-third of the first size;

wherein the change from the first to the second position causes a change in the amount of the optical signal that is reflected from the membrane.

5,589,975

OPTICAL AMPLIFICATION SYSTEM

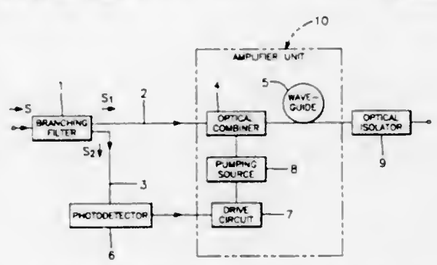
Kazunori Nakamura, Yokohama, Japan, and I. Kou Tei, Ontario, Canada, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 885,956, May 20, 1992, abandoned. This application Nov. 4, 1994, Ser. No. 334,444

Claims priority, application Japan, May 20, 1991, 3-143792

Int. Cl.[6] G02B *6/00;* **H01S** *3/131;* **H04B** *9/00*

U.S. Cl. 359—345 **4 Claims**



1. An optical amplification system comprising an optical amplifier unit having a silicate-glass type or fluoride-glass type optical waveguide capable of amplifying optical signals transmitted through said optical waveguide by means of the effect of optical amplification produced in the optical waveguide when pumped light is fed to said optical waveguide, said amplifier unit being operative only when in a saturated condition, pumped light being fed being to said optical waveguide only when an optical signal stream having an interval shorter than a relaxation life time of the optical waveguide is transmitted through said optical waveguide, no pumped light being fed to said optical waveguide when no optical signal stream is transmitted through said optical waveguide and when an optical signal stream having an interval longer than a relaxation life time of the optical waveguide is transmitted through said optical waveguide.

5,589,976

TELESCOPE WITH REAR CONVERTER AND REAR CONVERSION LENS AND TELESCOPE

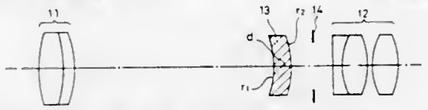
Moriyasu Kanai, and Hirofumi Matsuo, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,888

Claims priority, application Japan, Dec. 28, 1993, 5-70809 U; Dec. 5, 1994, 6-301183

Int. Cl.[6] G02B *21/36;23/00;15/02;13/00*

U.S. Cl. 359—362 **9 Claims**



1. A telescope with a rear converter, comprising:

a master telescope whose aberration has been independently corrected and which has an objective lens and an ocular lens; and

a rear conversion lens provided on an image side of said objective lens of said master telescope, said rear conversion lens being made of a single lens having a concave surface facing an object side;

wherein said rear conversion lens satisfies the following formulae;

$$f_o'/f_o>1,$$

and

$$0.5>(dx_2/dh_2)/(dx_1/dh_1)>1.3$$

wherein,

"f_o" designates a focal length of said objective lens of the master telescope;

"f_o'" designates a resultant focal length of said objective lens of said master telescope and said rear conversion lens;

"dx_1/dh_1" designates an inclination of an incident surface of said rear conversion lens at an incident point thereof, upon which light is incident at a height h_1 from an optical axis of the rear conversion lens; and,

"dx_2/dh_2" designates an inclination of an emission surface of said rear conversion lens at an emission point thereof, at which light is emitted from the rear conversion lens at a height h_2 from the optical axis;

and wherein $h_1=0.36(f_o)^2/mf_o'$, $h_2=0.36(f_o)/m$, and m=magnification of said master telescope.

5,589,977

BINOCULAR TUBE ASSEMBLY FOR A STEREOMICROSCOPE

Christian Lücke, Oberkochen; Uwe Vry, Aalen, and Ulrich Lemcke, Heidenheim, all of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim-Brenz, Germany

Filed Mar. 20, 1995, Ser. No. 406,400

Claims priority, application Germany, Mar. 24, 1994, 44 10 147.3

Int. Cl.[6] G02B *21/20*

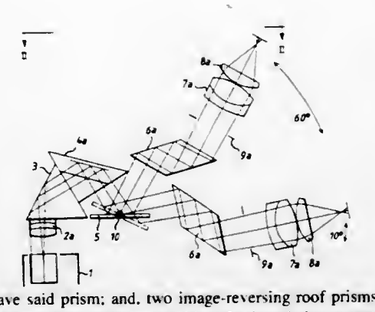
U.S. Cl. 359—375 **15 Claims**

1. A binocular tube assembly for a stereomicroscope defining at least two stereoscopic component beam paths along first and second optical axes, respectively, said binocular tube assembly comprising:

two sets of ocular optics;

pivot means for pivotally mounting said sets of ocular optics to pivot relative to said stereomicroscope through a pregiven angular range;

a prism component group including a deflecting prism having an entry face for receiving said component beam paths therein and an exit face through which said component beam paths leave said prism; and, two image-reversing roof prisms having respective roof edges, said roof prisms being mounted on one of said faces so as to cause said roof edges to be offset relative to respective ones of said optical axes; and,



an optical deflecting element common to both of said component beam paths and being mounted on said pivot means for deflecting said component beams toward said sets of ocular optics, respectively, for all positions of said ocular optics within said angular range.

5,589,978

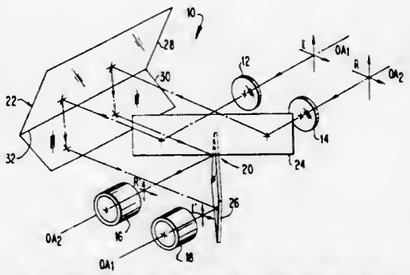
DUAL-PATH OPTICAL SYSTEM

Stephen D. Fantone, Lynnfield, Mass., assignor to Mobi Corporation, Lynnfield, Mass.

Division of Ser. No. 118,881, Sep. 9, 1993, Pat. No. 5,469,293. This application Jun. 7, 1995, Ser. No. 487,837

Int. Cl.[6] G02B *23/00;23/08*

U.S. Cl. 359—412 **7 Claims**



1. A dual-path, pseudoscopic optical system comprising:

a pair of objectives including fight and left objectives arranged along separate optical axes that are spaced apart from one another by a predetermined distance;

a pair of eyepieces including right and left eyepieces arranged, respectively, along a pair of rearwardly extending optical axes that are vertically offset with respect to said optical axes of said objectives;

a cross-coupled mirror system configured and arranged with respect to said pairs of objectives and said eyepieces to form pseudoscopic images of an object space which can be viewed via said eyepieces with the image formed by said fight objective being viewed through said left eyepiece and the image formed by said left objective being viewed through said fight eyepiece; and

means for adjusting an interpupillary distance between said eyepieces, said means for adjusting an interpupillary distance between said fight and left eyepieces is structured and arranged to move one of said eyepieces and one of said objectives in equal and opposite directions while keeping the other of said eyepieces and said objectives stationary.

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5,589,979

SIMULATOR ARRANGEMENT

Donald L. M. Martin, Mosman, Australia, assignor to Trutan Pty Limited, Homebush, Australia

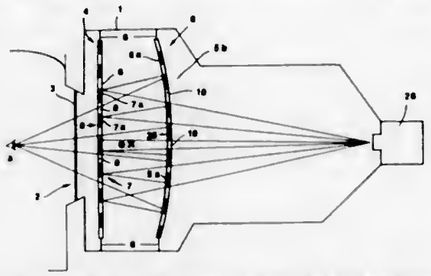
PCT No. PCT/AU93/00037, § 371 Date Mar. 15, 1994, § 102(e) Date Mar. 15, 1994, PCT Pub. No. WO93/17366, PCT Pub. Date Sep. 2, 1993

PCT Filed Jan. 27, 1993, Ser. No. 211,100

Claims priority, application Australia, Feb. 20, 1992, 11088/92

Int. Cl.[6] G03B *21/10;21/56;* **G02B** *5/08;27/10*

U.S. Cl. 359—449 **3 Claims**



1. A screen simulator arrangement including spaced apart screen means adapted to allow viewing of imagery and one or more mirror means adapted to cause partial reflection of imagery; said screen means being formed with a plurality of spaced apart transparent portions therein producing a distribution of screen pixels in said screen means; said mirror means including at least one curved mirror and being formed or provided with a plurality of holes or openings therein, producing a plurality of reflective portions in said mirror means; said screen means and said mirror means being fixedly mounted relative to each other; the transparent portions of said screen means and the holes or openings of said mirror means being substantially out of register one with the other; an inner screen surface of said screen means and a reflective surface of said mirror means generally facing inwardly towards each other; said transparent portions of said screen means and said holes or openings of said mirror means being so out of register one with the other, such that said screen pixels of said screen means are in substantial alignment/register with holes or openings in said mirror means; the arrangement being such that a projector spaced apart from an outer surface of said mirror means projects images at said outer surface thereof, and through said holes or openings therein, so that imagery will appear on said screen pixels of said screen means in substantial alignment/register with said holes or openings in said mirror means; said imagery being so reflected by said reflective portions of said mirror means, so as to be viewable through said transparent portions in said screen means, from a position spaced apart from an outer surface of said screen means.

5,589,980

THREE DIMENSIONAL OPTICAL VIEWING SYSTEM

Robert Bass, and John Bass, both of 2832 NE. 35th St., Fort Lauderdale, Fla. 33306

PCT No. PCT/US91/09737, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO93/13446, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 23, 1991, Ser. No. 256,402

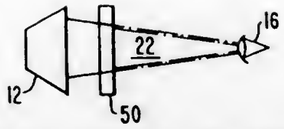
Int. Cl.[6] G02B *27/22*

U.S. Cl. 359—478 **7 Claims**

1. An optical viewing system for producing a simulated three dimensional image, comprising:

first means for displaying an image on a first electronic display device;

at least one second means for displaying an image on at least one second electronic display device, said at least one second electronic display device being a substantially transparent



display device, whereby an observer can view through transparent areas of the second electronic display device;

said first and second electronic display devices being located at different, predetermined locations along an optical viewing path such that the image displayed by said first electronic display device is projected through said at least one second electronic display device;

wherein said first electronic display device includes an image projector and said second electronic display device includes a controllable pixel display spaced therefrom, said controllable pixel display comprising a positive pixel display panel having a field of pixel elements which are controllably illuminated, said controllable pixel display being substantially transparent such that the image produced by the controllable pixel display is overlaid upon the image produced by said image projector.

5,589,981

RETROREFLECTOR TARGET FOR LASER RANGING

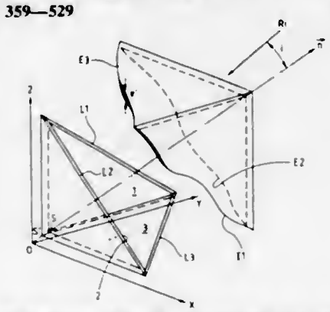
Michel Kasser, Joinville-Le-Pont, and Glenn Lund, Peillon, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Mar. 9, 1995, Ser. No. 401,188

Claims priority, application France, Mar. 10, 1994, 94 02773

Int. Cl.[6] G02B *5/122*

U.S. Cl. 359—529 **13 Claims**



1. A retroreflective target for laser ranging, said retroreflective target comprising:

at least one hollow cube corner retroreflector comprising three reflective surfaces which are substantially planar, are perpendicular to each other, and intersect at three edges, said three edges being substantially orthogonal to each other and converging at an apex, each of said at least one hollow cube corner retroreflector defining a geometrical normal lying at the same angle to each of said three edges;

a reference point coexisting on said geometrical normal at a predetermined distance from said apex in a direction away from said three reflective surfaces; and

a parallel-sided plate for each surface of said at least one hollow cube corner retroreflector, each said parallel-sided plate spaced a predetermined distance from each surface of said three reflective surfaces, each parallel-sided plate further being transparent to a light to be retroreflected, made from a material having a known refractive index, and having the same thickness.

5,589,982

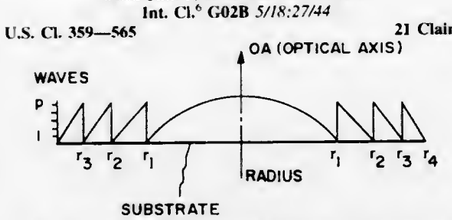
POLYCHROMATIC DIFFRACTIVE LENS

Dean Faklis, and G. Michael Morris, both of Fairport, N.Y., assignors to Rochester Photonics Corporation, Rochester, N.Y.

Filed Jun. 3, 1994, Ser. No. 254,018

Int. Cl.[6] G02B *5/18;27/44*

U.S. Cl. 359—565 **21 Claims**



1. A diffractive lens for directing a plurality of different wavelengths of radiation to a single focus which comprises a diffractive structure having a plurality of zones which define zone boundaries at which light incident on the structure experiences an optical phase shift, and which diffract light of each of said wavelengths in a different diffractive order, m, such that $m \geqq 1$, to said focus, thereby providing a plural order diffractive singlet.

5,589,983

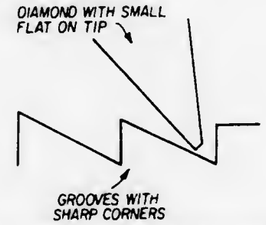
METHOD OF MANUFACTURING A DIFFRACTIVE SURFACE PROFILE

Mark M. Meyers, Hamlin, and Mark E. Schickler, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1993, Ser. No. 174,737

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—566 **20 Claims**



1. A method of manufacturing a diffractive surface profile comprising:

a) rotating a surface to be cut at a high speed W, where W>1,500 RPM;

b) translating a cutting tip at a low speed V, where V<1.2 mm/minute; and

c) cutting said surface with said cutting tip.

5,589,984

OVAL ELLIPTICAL MIRROR

William P. Schmidt, Rockwood, and Franklin D. Hutchinson, New Boston, both of Mich., assignors to Mirror Lite of North Carolina, Shallotte, N.C.

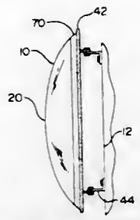
Division of Ser. No. 942,294, Sep. 9, 1992. This application Nov. 17, 1994, Ser. No. 341,665

Int. Cl.[6] G02B *5/08;5/10;7/182;* **B60R** *1/06*

U.S. Cl. 359—603 **9 Claims**

1. A mirror assembly, comprising:

(a) a mirror lens having a reflective outer surface and a non-reflective rear surface, the mirror lens comprising a mirror body which terminates in an oval perimetral edge, the edge surrounds the reflective surface and the non-reflective surface



of the mirror lens, the mirror body being a substantially convex ellipsoid having a major axis and a minor axis which intersects with the major axis, the major axis having a varying radius of curvature, which radius decreases from the intersection with the minor axis to the perimetral edge.

5,589,985

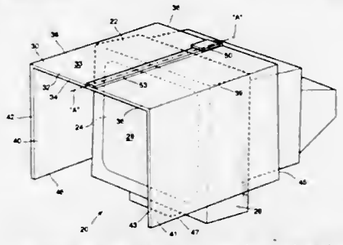
COMPUTER MONITOR HOOD

Philip Heller, 216 Coldstream Ave., Toronto, Ontario, Canada, and David Heller, 41 Ezrat Tora, Jeruselam, Israel

Filed Jun. 9, 1995, Ser. No. 488,908

Int. Cl.[6] G02B *27/00*

U.S. Cl. 359—608 **13 Claims**



1. A computer monitor hood for use in conjunction with a computer monitor having a top surface, left and right side surfaces, and a forwardly facing screen, said computer monitor hood comprising:

a top shading panel having a front edge, a rear edge, and left and right side edges;

left and right side shading panels operatively attached to said top shading panel and disposed in generally vertically oriented relation to said left and right side edges of said top shading panel, respectively, left and right side shading panels each having front, rear, and bottom edges;

a front-to-rear main axis; and

at least one counterweight of weight to balance said computer monitor hood, mounted on a receiving portion of said computer monitor hood in selectively manually movable relation among any one of a plurality of front-to-rear positions so as to permit said counterweight to balance said computer monitor hood at a selected position on the computer monitor;

wherein said counterweight is operatively mounted on said top surface of said computer hood by means of a hook loop fastener system comprising an elongate strip of one component of said hook and loop fastener system disposed on said computer monitor hood and extending generally parallel to said main axis of said computer monitor hood, with the other component of said hook and loop fastener system disposed on said counterweight; and

wherein, when said computer monitor hood is in place on a computer monitor, said top, left and right shading panels each project forwardly from the front of the computer monitor, at the respective of the top, left side, and right side surfaces of the computer monitor, so as to shade the screen of the computer monitor.

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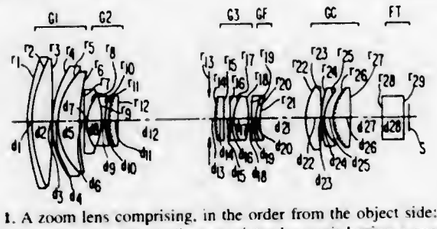
5,589,986

ZOOM LENS

Hironori Shibata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 9, 1995, Ser. No. 437,477
Claims priority, application Japan, May 18, 1994, 6-103851
Int. Cl.[6] G02B *15/14;3/02*
U.S. Cl. 359—684 **24 Claims**



1. A zoom lens comprising, in the order from the object side:

a front lens group including a variator lens unit having a negative refractive power;

an aperture stop; and

a rear lens group arranged behind the aperture stop;

wherein the rear lens group includes a lens unit having a positive refractive power, a focusing lens unit having a negative refractive power, a compensator lens unit having a positive refractive power for correcting variation of a position of an image due to variation of magnification; and

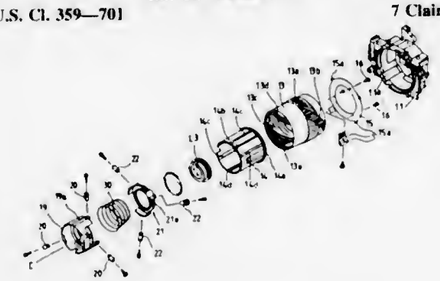
the distance between the lens unit having the positive refractive power and the focusing lens unit is constant during variation of magnification and variable during focusing.

5,589,987

ZOOM LENS BARREL

Hitoshi Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 106,574, Aug. 16, 1993, Pat. No. 5,488,513. This application Aug. 9, 1995, Ser. No. 513,029
Claims priority, application Japan, Aug. 17, 1992, 4-217919
Int. Cl.[6] G02B *15/14*
U.S. Cl. 359—701 **7 Claims**



1. A zoom lens barrel, comprising:

a cam ring that is threadedly engaged to a female helicoid formed in a stationary barrel;

a linear movement guide member that is rotatable relative to said cam ring and movable in an optical axis direction together with said cam ring;

at least three movable lens groups, including first, second and third lens groups that are guided in said optical axis direction by said linear movement guide member, said first, second and third lens groups being located in this order from an object side of said zoom lens barrel;

a first lens frame that holds said first lens group and is provided with a helicoid, wherein another helicoid is formed on said cam ring to engage with said helicoid of said first lens frame;

a plurality of cam grooves formed on said cam ring to drive said second and third lens groups behind said first lens group;

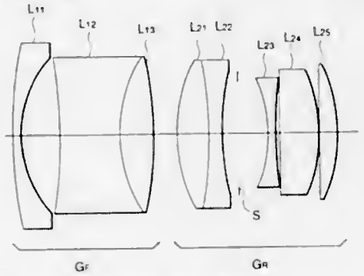
wherein said helicoid on the first lens frame is a male helicoid, and said helicoid on said cam ring is a female helicoid.

5,589,988

RETROFOCUS-TYPE WIDE ANGLE LENS SYSTEM HAVING A FIXED FRONT LENS GROUP AND A MOVABLE REAR LENS GROUP

Yutaka Suenaga, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 231,042, Apr. 22, 1994, abandoned. This application Dec. 7, 1995, Ser. No. 568,522
Claims priority, application Japan, Apr. 26, 1993, 5-099602
Int. Cl.[6] G02B *13/04*
U.S. Cl. 359—752 **18 Claims**



1. A wide angle lens system comprising:

a front lens group; and

a rear lens group having positive refractive power;

said front lens group including, in the order from the object side, a negative meniscus lens component having a convex surface facing the object side, and a cemented lens component having a negative lens element, a positive lens element and a convex cemented surface with positive refractive power facing the object side,

said rear lens group including, a cemented lens component having a positive lens element, a negative lens element and a convex surface facing the object side,

wherein the distance between said front lens group and said rear lens group decreases during focusing operation from the infinite object distance toward the shortest object distance.

5,589,989

COMPACT OBJECTIVE LENS SYSTEM

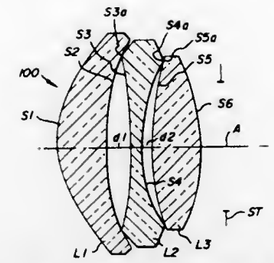
Lee R. Estelle, Rochester, and William T. Goosey, Jr., Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1993, Ser. No. 84,387
Int. Cl.[6] G02B *9/14*
U.S. Cl. 359—785 **34 Claims**

1. A lens system comprising from an object side:

a first positive power meniscus lens component having a foremost lens surface convex to the object side;

a second bi-concave lens component engaging said first lens component and defining with said first lens component an airspace separating said second lens component from said first component;



a third bi-convex lens component engaging said second lens component and defining with said second lens component an airspace between said third lens component from said second lens component; and

a diaphragm arranged behind the rear-most lens element of the lens system, wherein all of the airspaces between said lens components are so arranged that there exists between all of adjacent lens components an edge contact located only at points located within the region from over 0.0 mm at a position to sufficiently eliminate stray light to about 2 mm beyond clear aperture diameter, and wherein the lens system fulfills the following conditions:

$$N_3 - N_1 \leqq 0.1$$

$$\frac{N_1}{N_2} \geqq 0.9$$

$$0.25f < \Sigma d < 0.35f$$

where:

f is the composite focal length of the lens system;

Σd is the distance from the vertex of the foremost lens surface to the vertex of the last lens surface;

N_1 represents the refractive index of a positive lens element forming the first lens component;

N_2 represents the refractive index of a negative lens element forming the second lens component; and

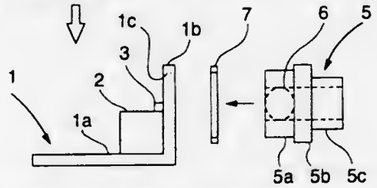
N_3 represents the refractive index of a positive lens element forming the third lens component.

5,589,990

LIGHT EMITTING ELEMENT MODULE AND MANUFACTURING METHOD THEREFOR

Takashi Kato, and Hiromi Nakanishi, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 7, 1995, Ser. No. 481,100
Claims priority, application Japan, Jun. 14, 1994, 6-155173
Int. Cl.[6] G02B *27/02*
U.S. Cl. 359—799 **5 Claims**



1. A light emitting element module comprising:

a substrate, said substrate including a portion having a through hole;

a light emitting element mounted on said substrate;

a lens as an optical system for at least one of the focusing and artificially collimating light emitted from said light emitting element;

a lens holder for holding said lens therein, said lens holder having an insertion portion for being inserted in said through hole and a flange portion having an outer diameter larger than an inner diameter of said through hole; and

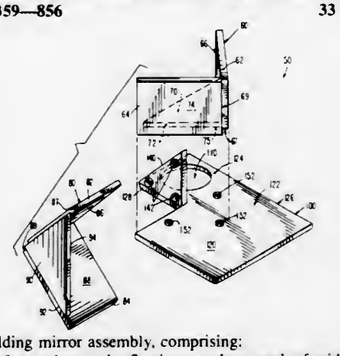
a spacer inserted between said portion of said substrate and said flange portion of said lens holder for defining a distance between said light emitting element and said lens.

5,589,991

OPTICAL ASSEMBLY WITH FOLDING MIRROR ASSEMBLY

Zvi Bleier, Comack, N.Y., assignor to PLX Inc., Deer Park, N.Y.

Filed Nov. 19, 1993, Ser. No. 156,023
Int. Cl.[6] G02B *5/08;7/182;* **G03B** *13/08*
U.S. Cl. 359—856 **33 Claims**



1. A folding mirror assembly, comprising:

at least first and second reflecting members, each of said reflecting members comprising first and second panels, each of said panels having a reflecting surface, said reflecting surface of said first panel disposed at substantially a right angle to said reflecting surface of said second panel, and a support panel having a receiving surface, wherein each of said panels has a side at substantially a right angle to said surface of said panel, and wherein each of said panels is abutting and joined along said side to said surface of said panel immediately adjacent to said side; and

a plate member having a plurality of mouting pads for mounting said first and second reflecting members thereon so that one of said reflecting surfaces of said first reflecting member is in reflecting relation with one of said reflecting surfaces of said second reflecting member.

5,589,992

MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR PERFORMING SLOW-MOTION REPRODUCTION WITH HIGHER QUALITY OF IMAGE

Hideyo Shibata, Neyagawa; Ritsuro Kinoshita, Hirakata; Takayasu Yoshida, Osaka, and Shigeo Eshima, Otokuni-gun, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 3, 1994, Ser. No. 285,282
Claims priority, application Japan, Aug. 4, 1993, 5-193427; Mar. 29, 1994, 6-057916; Mar. 29, 1994, 6-057918
Int. Cl.[6] H04N *5/78*
U.S. Cl. 386—72 **24 Claims**

1. A magnetic recording and reproducing apparatus for reproducing a video signal recorded on a video track of a magnetic tape by means of a pair of magnetic heads arranged in a rotation drum so as to oppose to each other at an angle of 180 degrees, while rotating a capstan for moving said magnetic tape in the longitudinal direction thereof, comprising:

two memories each for storing a video signal of at least one field;

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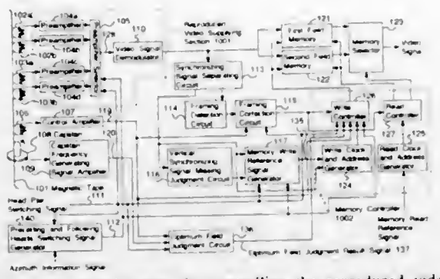


memory control means for controlling the reproduced video signal to be written into and be read out from said two memories;

reproduced video signal supply means for supplying a reproduced video signal reproduced from the magnetic tape by means of said pair of magnetic heads to said two memories;

control signal reproducing means for reproducing a control signal for tracking control recorded on the magnetic tape;

capstan frequency generating signal generating means for generating a capstan frequency generating signal in synchronous with rotation of said capstan; and

optimum field judgment means for judging a time interval including a timing when a scanning trace of each of said pair of magnetic heads coincides with the video track in the vicinity of the center of the video track based on a head pair switching signal for switching over between said pair of magnetic heads, said control signal, and said capstan frequency generating signal, and supplying a judgment signal representing the time interval;

wherein, when the magnetic tape is continuously moved in a forward or reverse direction at a speed slower than a normal reproduction speed, said memory control means controls the reproduced video signal of one field to be written into one of said two memories for the time interval represented by the judgment signal supplied by said optimum field judgment means, whereas said memory control means simultaneously controls the reproduced video signal of another one field to be read out from another one of said two memories.

5,589,993

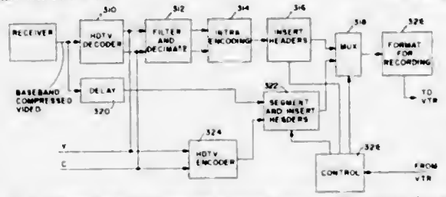
DIGITAL HIGH DEFINITION TELEVISION VIDEO RECORDER WITH TRICK-PLAY FEATURES

Saiprasad V. Naimpally, Langhorne, Pa., assignor to Matsushita Electric Corporation of America, Secaucus, N.J.

Continuation of Ser. No. 21,248, Feb. 23, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 339,647

Int. Cl.[6] H04N *5/78*

U.S. Cl. 386—81 **8 Claims**



1. Apparatus which processes signals representing video image information to produce a signal to be recorded on a tape by a digital video tape recorder (VTR), whereby the image may be displayed from the recorded signal when the VTR is operating in a trick-play mode, said apparatus comprising:

means for providing a first data stream representing a relatively high resolution video image which has been encoded using motion compensated encoding techniques;

data compression means for compressing the first data stream to generate a segmented second data stream representing a relatively low resolution version of said high resolution image,

wherein the first data stream is independent of the second data stream for reproducing the image, the second data stream is independent of the first data stream for reproducing the image, and each segment of the second data stream may be expanded independently of any other segment;

means for segmenting the first data stream to produce a first set of data segments representing the high resolution image;

means for interleaving respective data segments representing the first and second data streams to generate the signal to be recorded by the VTR, whereby image data recorded in the low resolution data segments is displayed in trick-play mode.

5,589,994

IMAGE RECORDING METHOD AND APPARATUS WITH REDUCED ERROR PROPAGATION

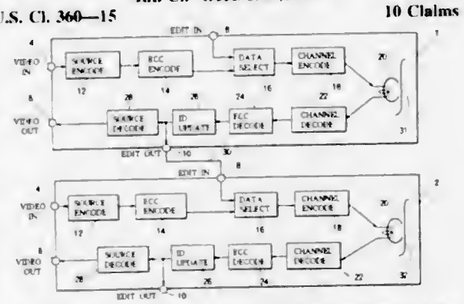
Tatsuo Yamasaki; Ikuo Okuma, and Ken Onishi, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1993, Ser. No. 109,723

Claims priority, application Japan, Aug. 21, 1992, 4-222493; Jul. 29, 1993, 5-208494

Int. Cl.[6] G11B *5/86;5/09*

U.S. Cl. 360—15 **10 Claims**



1. A method of copying compressed digital data from a first medium to a second medium, comprising the steps of:

(a) reading, from said first medium, compressed digital data comprising codewords having check fields and flags, said flags identifying codewords with uncorrected errors;

(b) using said check fields to correct errors in said codewords;

(c) using said check fields to detected uncorrectable errors in said codewords;

(d) updating said flags to identify codewords in which uncorrectable errors were detected in said step (c); and

(e) recording said compressed digital data as read in said step (a) and corrected in said step (b) on said second medium, together with the check fields used in said steps (b) and (c) and said flags as updated in said step (d).

5,589,995

HEADER INFORMATION OF INFORMATION SIGNAL RECORDING AND REPRODUCING METHOD AND APPARATUS THEREFOR

Seiichi Saito; Toshifumi Takeuchi; Masafumi Nakamura; Junji Shiokawa, and Osamu Kawamae, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

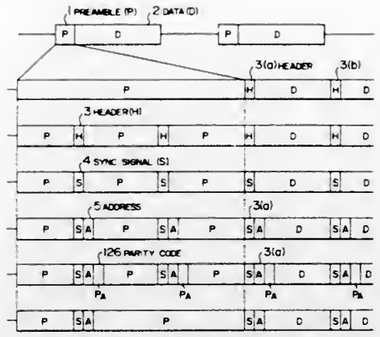
Continuation of Ser. No. 218,701, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 956,597, Oct. 5, 1992, abandoned, which is a continuation of Ser. No. 428,949, Oct. 30, 1989, abandoned. This application Jan. 11, 1996, Ser. No. 583,861

Claims priority, application Japan, Nov. 2, 1988, 63-276243

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—48 **32 Claims**

1. A method for processing a digital information signal in a system having a recording medium, the method comprising the steps of:



designating discrete areas on the recording medium;

sequentially arranging a preamble area and a data frame area in each of said discrete areas;

sequentially arranging a plurality of data block areas in said data frame area of each of said discrete areas;

sequentially arranging a header area and a data area for recording said digital information signal in each of said data block areas;

providing a block synchronizing area for recording a block synchronizing signal, block synchronizing signals being identical to one another and indicative of a head position of each said data block area, and a block address area for recording a block address signal for discriminating said data block areas in each said header area;

providing one or more clock regenerating areas for recording a block regenerating signal for executing bit synchronism and a plurality of dummy header areas to each said preamble areas;

providing a dummy block synchronizing area in each said dummy header area for recording a dummy block synchronizing signal identical with a corresponding block synchronizing signal, and a dummy block address area in each said dummy header area for recording a dummy block address signal for discriminating a position of said dummy block synchronizing area; and

arranging each said dummy block synchronizing area included in each said dummy header area in at least two positions among respective positions of which distance between an arbitrary succeeding two of said dummy block synchronizing areas is substantially the same as the distance between the block synchronizing area included in the first one of said header areas and the adjacent dummy block synchronizing area.

5,589,996

METHOD AND APPARATUS FOR CONTROLLING SPINDLE SPEED TO COMPENSATE FOR DRAG IN A DISK DRIVE SYSTEM

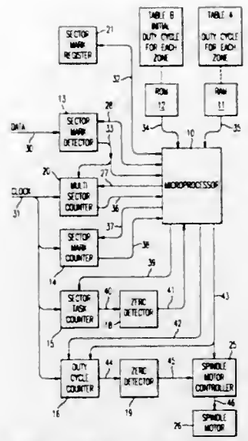
Paul R. Patrick, Longmont, and Walter Wong, Boulder, both of Colo., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 13, 1993, Ser. No. 167,317

Int. Cl.[6] G11B *19/24*

U.S. Cl. 360—73.03 **10 Claims**

1. A control system for controlling the speed of a spindle motor for rotating disks in a disk drive system at a constant speed where the transducers ride or fly upon a medium between said disks and said transducers thereby exerting a load upon said spindle motor, said load having a non uniform profile across the disks from the inner diameter to the outer diameter of said disks where said load at any location across said disk is a function of the type of medium upon which said transducers ride or fly above said disks, said location itself and the physical environment being experienced by said medium at any given instant of time, said disk drive system comprising disks having a plurality of concentric addressable tracks between said inner and outer diameters of said disks, a positioning and track following system for moving said transducers to an addressed track on said disk and for maintaining said transducers' position with reference to the presently addressed track, read/write means connected to said transducers for reading or writing data from or to said disks, said control system comprising:



each of said tracks is divided in sectors;

storage means for storing for each said addressable track initial speed control data, said initial speed control data for an addressable track including a power setting which includes compensation for said load exerted on said spindle motor by said transducers at said addressable track for defining the power to be applied to said spindle motor to maintain said spindle motor at said constant speed; and

control means for applying the power indicated by said initial speed control data for said addressed track for maintaining said speed of said spindle motor at said constant speed, said control means during each sector alters a present power setting of a present sector to form an altered power setting by a correction factor to change the speed of said spindle motor towards said constant speed if said speed of said spindle motor was not at said constant speed where said altered power setting becomes said present power setting and is used for a next sector to occur immediately following said sector generating said altered power setting.

5,589,997

TRACKING CONTROL METHOD AND APPARATUS FOR VIDEO RECORDER WHICH ADDS A COMBINED FIRST AND SECOND TRACKING ERROR SIGNAL TO THE NEXT TRACKING ERROR SIGNAL

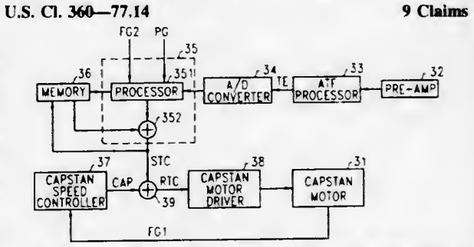
Jeong-tae Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 16, 1994, Ser. No. 260,825

Claims priority, application Rep. of Korea, Jun. 16, 1993, 1993-10977

Int. Cl.[6] G11B *5/588;15/467*

U.S. Cl. 360—77.14 **9 Claims**



1. A tracking control apparatus for read out of information recording on a track of a magnetic tape driven by a capstan motor, said tracking control apparatus comprising:

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a capstan speed controller receiving a rotation number signal of said capstan and comparing the input rotation number signal and a predetermined rotation number thereof, thereby outputting a first capstan speed control signal;

tracking error generating means receiving a pilot signal for generating a tracking error signal;

a memory for storing a renewed second capstan speed control signal as one of second capstan speed control signals generated respectively at corresponding control positions of a track;

tracking control means receiving said tracking error signal and a respective one of said second capstan speed control signals, stored in said memory and corresponding to said tracking error signal, for renewing and outputting said second capstan speed control signal as the respective renewed second capstan speed control signal;

first adding means for adding said respective renewed second capstan speed control signal and said first capstan speed control signal applied from said capstan speed controller to thereby generate a real capstan speed control signal; and

means for rotatingly driving said capstan in response to the real capstan speed control signal output by said first adding means.

5,589,998

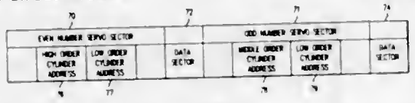
CYLINDER ADDRESS STORAGE IN MULTIPLE SERVO SECTORS OF A TRACK

Mantle M. Yu, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1994, Ser. No. 361,624

Int. Cl.[6] G11B *5/596*

U.S. Cl. 360—78.14 **36 Claims**



1. A disk drive system, comprising:

a data recording disk having radially spaced tracks, each track having a plurality of servo sectors; and,

a cylinder address for identifying each track, said cylinder address divided into a plurality of cylinder address sub-sections where each sub-section comprises a partial cylinder address and wherein a predetermined number of said cylinder address sub-sections, less than the total number of said cylinder address sub-sections, are stored in each servo sector embedded on each track;

a head mounted in said disk drive system for reading said cylinder address sub-sections; and

a servo system in communication with said head to construct a cylinder address from said cylinder address sub-sections.

5,589,999

TAPE RECORDER AND OFFSET PLAYBACK APPARATUS WITH A VARIABLE TAPE LENGTH BETWEEN THE RECORDING AND READING HEAD

Marc Hayat, 13 rue de Liège, Paris, France, and Max de Ferran, 4 Grande Rue, Bazainville, France

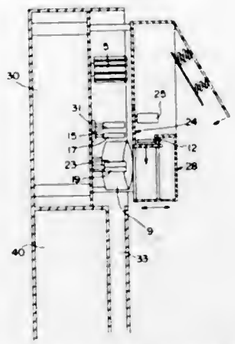
PCT No. PCT/FR93/00666, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO94/01863, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 1, 1993, Ser. No. 367,182

Claims priority, application France, Jul. 1, 1992, 92 08085

Int. Cl.[6] G11B *5/027*

U.S. Cl. 360—85 **11 Claims**



1. Apparatus for recording and playback, of a recording tape such as a video-tape recorder or tape recorder tape. With which playback can be selectively carried out in three modes which are an immediate playback mode, a simultaneous offset playback mode in which the apparatus simultaneously records on a first region of the tape and reads a second region of the tape, which is at a distance from the first region, and a playback alone mode, the apparatus comprising a recording head (9), means for having the tape (2) circulate in front of the recording head and from a recording reel (6) respectively, a reading head (8), means for having the tape circulate in front of the reading head towards and from a playback reel (7) respectively, both the heads being provided with means enabling them to be actuated independently of each other, a storage hopper (33), located operatively between the two heads (8 and 9) for receiving and storing in loose and random folds a tape portion corresponding to the distance between said first and second regions of the tape, means for selectively actuating the reading head and selectively feeding the tape in forward and reverse in front of the reading head independently of actuation of the recording head, whereby during recording of the first region of the tape by the recording head the second region of the tape can be selectively read by the reading head and fed without being read, selectively with and without change of the distance between the first and second regions of the tape, fitting means (28) for a cassette (1) with two reels (6 and 7) each of which is associated with one of the ends of the tape, the recording and reading heads being arranged so that each one cooperates with one of the cassette reels, one of which in operation constitutes the recording reel and the other the playback reel respectively, and means (3, 24 and 25) for bringing the tape into position in relation to the storage hopper (33) after insertion of the cassette into operational relationship with the fitting means.

5,590,000

PIVOTING DEVICE FOR A SHUTTER ARRANGED IN THE AREA OF THE INSERTION OPENING OF THE LOADING MECHANISM OF A MAGNETIC-TAPE CASSETTE APPARATUS

Christian Hopf, Hüttenberg-Rechtenbach, and Hans-Georg Hermanni, Sinn-Fleisbach, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 293,984, Aug. 22, 1994, abandoned. This application Feb. 8, 1996, Ser. No. 598,417

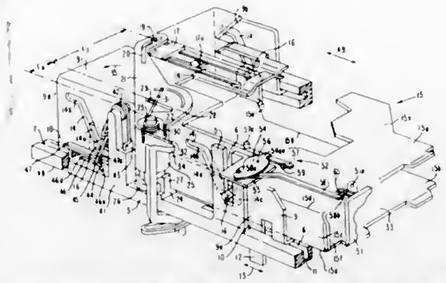
Claims priority, application Germany, Aug. 24, 1993, 43 28 443.4

Int. Cl.[6] G11B *15/675*

U.S. Cl. 360—96.5 **14 Claims**

1. A pivoting device for a shutter pivotally arranged at a cassette insertion opening of a magnetic tape cassette apparatus, which cassette apparatus includes (i) a loading mechanism comprising a slide, translatable in an insertion and an ejection direction, between a slide takeover position and a slide play position, which loading mechanism (a) moves a tape cassette into and out of the apparatus through the cassette insertion opening and (b) moves the tape cassette between a takeover position and a play position corresponding to the takeover and play positions of the slide, respectively, and (ii) an electromotive drive for moving said slide, said drive being loaded to its greatest load while the loading mechanism moves the tape cassette from the play to the takeover position, wherein said pivoting device comprises:

a coupling lever;



shutter coupling means for disengagingly coupling said coupling lever to the shutter, said coupling lever being pivotable to move the shutter between an open and a closed position;

an actuating rod engageable with said coupling lever, said slide being coupled to the actuating rod for moving the actuating rod in the insertion and ejection direction during respective movement of said slide in each of said insertion and ejection directions,

said actuating rod being arranged relative to said coupling lever such that said actuating rod (i) is not coupled to said coupling lever during movement of said slide in the ejection direction from said slide play position to said slide takeover position by said electromotive drive, during which said electromotive drive is loaded to its greatest extent, and (ii) is coupled to said coupling lever when said slide is moved in the ejection direction from the slide takeover position.

5,590,001

BREATHER FILTER UNIT FOR MAGNETIC DISK DRIVE

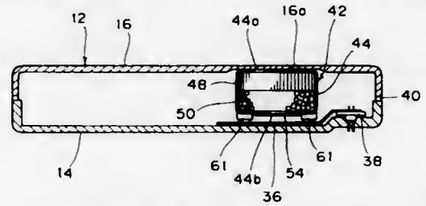
Tsuneyori Ino; Tsuyoshi Furukawa; Masaki Jinbo; Hisashi Kaneko; Shinichi Fukuzawa; Masaharu Sugimoto; Yoshiaki Nagasawa; Katsuaki Ishida; Osamu Yamazaki; Yukihiro Komura, all of Kawasaki, and Tomoo Sukagawa, Higashine, all of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 29, 1994, Ser. No. 346,370

Claims priority, application Japan, Mar. 15, 1994, 6-044192; Apr. 19, 1994, 6-080185

Int. Cl.[6] G11B *33/14*

U.S. Cl. 360—97.02 **8 Claims**



1. A breather filter unit for a magnetic disk drive including a base and a cover fixed to said base, said cover having a vent, said breather filter unit comprising:

a casing fixed to an inner surface of said cover, said casing having a vent inlet communicating with said vent of said cover and a vent outlet communicating with an inside of said magnetic disk drive, said vent outlet being opposed to said vent inlet;

a first filter contained in said casing at a position adjacent to said vent inlet, said first filter comprising a plurality of fibers extending in a direction substantially parallel to that of an air flow from said vent inlet toward said vent outlet;

a second filter bonded to said casing so as to cover said vent outlet; and

an activated carbon layer contained in said casing at a position between said first filter and said second filter.

5,590,002

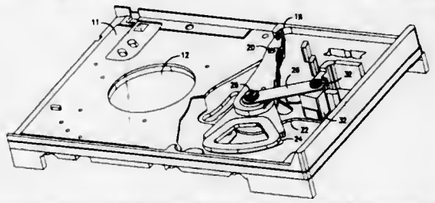
COMPLIANT ANCHOR FOR SECURING DISK DRIVE ACTUATOR BEARING

Allen T. Bracken, Layton, and Edward L. Rich, Ogden, both of Utah, assignors to Iomega Corporation, Roy, Utah

Filed Jan. 23, 1995, Ser. No. 377,033

Int. Cl.[6] G11B *33/14;5/54*

U.S. Cl. 360—97.02 **10 Claims**



1. A magnetic disk drive in which recording media is engaged by read/write heads comprising:

a base;

an arm carrying said read/write heads into engagement with said media;

a body having a side from which said arm projects and another side;

a fork having tines which extend from said other side of said body;

an actuator bearing assembly around which said arm and said body pivots, said assembly being mounted to said base;

an actuator including a coil in said fork for rotating said arm;

shelves including a shelf extending across the bottom edge of said other side of said body between said tines of said fork for holding said coil;

a projection extending upwardly from said base and being unitary with said base; and

a compliant member connecting the top of said bearing assembly solely to said projection, said member being stiff in a direction of actuation forces applied to said bearing assembly when said actuator rotates said arm, the compliance of said member being in a direction transverse to said direction of said actuation forces.

5,590,003

HYDRODYNAMIC SPINDLE MOTOR HAVING DISTRIBUTED WINDINGS

John C. Dunfield, Santa Cruz, and Gunter K. Heine, Aptos, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 8, 1995, Ser. No. 400,661

Int. Cl.[6] G11B *17/02;* **H02K** *3/00;* **F16C** *32/06*

U.S. Cl. 360—98.07 **15 Claims**

15. A disc drive data storage system, comprising:

a housing;

a central axis;

a stationary member which is fixed with respect to the housing and coaxial with the central axis;

a hub;

a hydrodynamic bearing interconnecting the hub with the stationary member such that the hub is rotatable

about the central axis;

at least one data storage disc attached to and coaxial with the hub;

at least one rotor magnet attached to the hub;

a stator which is coaxial with the hub, wherein the stator has a circumference and a plurality of slots positioned about the circumference; and

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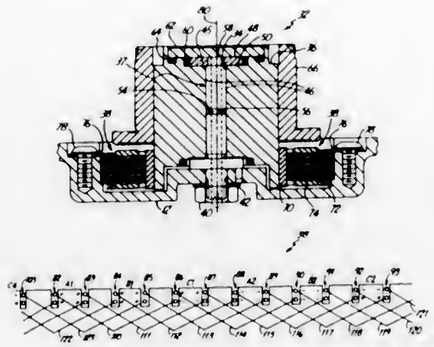


a three phase stator winding, with each phase comprising at least one phase winding formed of a plurality of turns, wherein the plurality of turns of each phase is distributed among adjacent slots and has a pitch of about 120 electrical degrees, and wherein at least one of the slots includes turns of more than one phase.

5,590,004

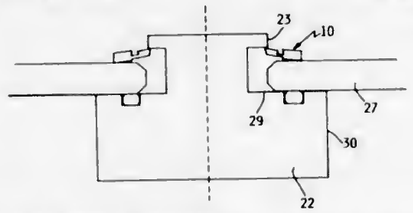
RESILIENT CLAMP AND COMPLIANT ELEMENT DATA DISK SUPPORT SYSTEM

Zine-Eddine Boutaghou, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1994, Ser. No. 366,960

Int. Cl.[6] G11B *17/02;17/08;23/00;25/00*

U.S. Cl. 360—99.12 **18 Claims**



1. A disk assembly, comprising:

(a) a spindle disposed rotatably around a fixed axis, the spindle comprising a rim formed at a lower portion of the spindle, the rim having an upper surface defining a groove, the spindle further comprising an upper portion, the upper portion comprising a flange extending radially outward from the axis and spaced axially above the rim;

(b) at least one disk having a recording surface for recording data, the at least one disk having an upper side, the at least one disk further having a lower side facing the rim;

(c) a resilient clamping member having a lower end facing the upper side of the at least one disk, the resilient clamping member flexibly engaging the upper portion of the spindle for providing bias against the upper side of the at least one disk, the resilient clamping member further comprising an annulus, the annulus including a first portion at an inner radius of the annulus, the first portion extending radially inward and axially upward toward the flange; and

(d) a compliant element disposed in the groove and supported by the rim so that an upper portion of the compliant element is compressed toward the upper surface of the rim by the bias of the resilient clamping member;

(e) wherein, during a shock capable of separating the at least one disk a space away from the upper surface of the rim, the resilient clamping member and the compliant element cooperate to allow displacement of the at least one disk in response to the shock and to buffer the displaced at least one disk from impact with the upper surface of the rim, wherein the resilient clamping member flexes to allow the displacement and the compliant element in response to the flexing of the resilient clamping member, expands to fill at least a portion of the space between the lower side of the at least one disk and the upper surface of the rim.

5,590,005

THIN FILM MAGNETIC HEAD

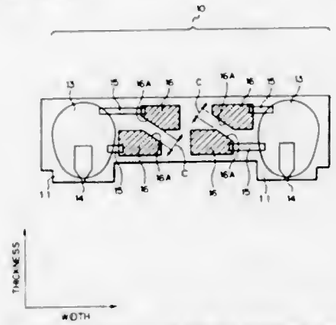
Hiroaki Tachibana, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 162,894, Dec. 8, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 498,001

Claims priority, application Japan, Dec. 10, 1992, 4-352647

Int. Cl.[6] G11B *5/31;5/60*

U.S. Cl. 360—103 **5 Claims**



1. A thin film magnetic head having terminals formed on a slider, comprising:

a pair of magnetic elements provided on said slider at spaced locations along a direction of width of said slider; and

a pair of first and second terminals connected to one of said magnetic elements by first and second leads, respectively, and a pair of third and fourth terminals connected to the other of said magnetic elements by third and fourth leads, respectively, said first and second terminals being spaced a predetermined distance from each other in a direction of thickness of said slider, which is normal to said direction of width of said slider, and deviated from each other in said direction of width of said slider so that a first end of said first terminal which is closest to said one of said magnetic elements is closer to said one of said magnetic elements in said direction of width of said slider than any end of said second terminal, and a second end of said first terminal opposite to said first end of said first terminal is further from said one of said magnetic elements in said direction of width of said slider than a first end of said second terminal, said first end of said second terminal is closest to said one of said magnetic elements, and is closer to said one of said magnetic elements in said direction of width of said slider than a second end of said second terminal opposite to said first end of said second terminal, and said third and fourth terminals being spaced a second predetermined distance from each other in said direction of thickness of said slider and deviated from each other in said direction of width of said slider so that a first end of said third terminal which is closest to said other of said magnetic elements is closer to said other of said magnetic elements in said direction of width of said slider than any end of said fourth terminal, and a second end of said third terminal opposite to said first end of said third terminal is further from said other of said magnetic elements in said direction of width of said slider than a first end of said fourth terminal, said first end of said fourth terminal is closest to said other of said magnetic elements, and is closer to said other of said magnetic elements in said direction of width of said slider than a second end of said fourth terminal opposite to said first end of said fourth terminal, said first terminal having a corner thereof removed to form a first slant and said second terminal having a corner thereof removed to form a second slant, said first and second slants being substantially parallel to each other, and said third terminal having a corner thereof removed to form a third slant and said fourth terminal having a corner thereof removed to form a fourth slant, said third and fourth slants being substantially parallel to each other.

5,590,006

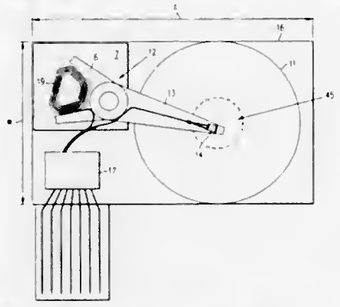
ONE-SIDED, SINGLE PLATTER HARD DISK WITH CENTER PARKING FEATURES

Mathew K. Shafé , Campbell, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,463

Int. Cl.[6] G11B *5/54;21/22*

U.S. Cl. 360—105 **39 Claims**



1. A disk drive assembly, comprising:

a disk including an upper data recording surface having a substantially coplanar region at its center with an axis of rotation of said disk passing through said coplanar region, and a lower surface;

means disposed below said disk for rotating said disk;

an actuator assembly including a suspension supporting a transducer, and means for selectively moving said transducer over said data recording surface and said substantially coplanar region; and

means for parking said transducer on said substantially coplanar region.

5,590,007

MAGNETIC HEAD DRIVING APPARATUS HAVING A MAGNETIC HEAD WHICH IS IMMUNE TO THE INFLUENCE OF A MAGNETIC CIRCUIT

Yoshifumi Yanagawa, Kyoto, and Tadashi Kunihira, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 62,610, May 18, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,514

Claims priority, application Japan, Jun. 29, 1992, 4-170410

Int. Cl.[6] G11B *5/588*

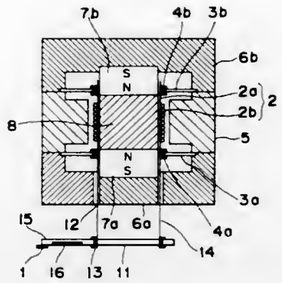
U.S. Cl. 360—109 **7 Claims**

1. A magnetic head driving apparatus which comprises:

a first yoke having a plurality of apertures therein and composed of a magnetic material;

a cylindrical first permanent magnet secured to said first yoke;

a second yoke composed of empty cylindrical magnetic material which is opposite to a side face of said first permanent magnet and which is mounted on said first yoke;



a third yoke composed of a magnetic material mounted on said second yoke;

a second permanent magnet secured to said third yoke; a magnetic core composed of a magnetic material disposed between said first permanent magnet and said second permanent magnet; a first gimbal spring mounted on said first yoke or said second yoke; a second gimbal spring mounted on said second yoke or said third yoke; a coil bobbin mounted on said first gimbal spring and said second gimbal spring; a coil wound around said coil bobbin; a plurality of rigid projecting portions of said coil bobbin extending through said plurality of apertures of said first yoke;

a head base mounted on and supported by said extended rigid projecting portions of said coil bobbin so as to position a magnetic head mounted on said head base on an external side of said first yoke, each of said plurality of rigid projecting portions being integrally formed with the coil bobbin; and

a sensor object for showing the gap position provided on said head base;

wherein said head base undergoes no deformation angle when said magnetic head is displaced.

5,590,008

MAGNETIC DISC UNIT HAVING A PLURALITY OF MAGNETIC HEADS WHICH INCLUDE MULTILAYER MAGNETIC FILMS

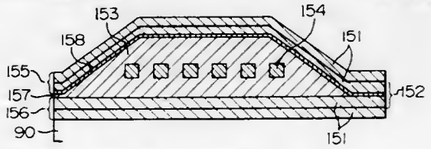
Masanori Tanabe, Odawara; Hiroshi Fukui, Hitachi; Tadayuki Iwakura, Hitachi; Kazuhiro Nakamoto, Hitachi; Moriaki Fuyama, Hitachi; Katsuya Mitsuoka, Hitachi; Masaaki Sano, Hitachi; Makoto Saito, Hiratsuka; Makoto Aihara, Katsuta, and Shuji Sudo, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 873,219, Apr. 24, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 324,380

Claims priority, application Japan, Apr. 25, 1991, 3-095145

Int. Cl.[6] G11B *5/147*

U.S. Cl. 360—126 **30 Claims**



1. A magnetic disc unit comprising:

a magnetic recording medium;

a thin film magnetic head which confronts said magnetic recording medium,

wherein said thin film magnetic head includes at least an upper magnetic core and a lower magnetic core;

a head slider for carrying said thin film magnetic head;

a spring member for supporting said head slider; a guide arm for connecting said spring member to a positioning mechanism;

a disc rotation control system for rotating a disc relative to said recording medium;

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a head positioning control system for positioning said magnetic head;

a recording/reproducing signal control system; and

wherein at least an upper magnetic core of said thin film magnetic head includes at least two magnetic films, and

a layer of magnetic material of said upper magnetic core in contact with a magnetic gap between said upper magnetic core and said lower magnetic core, said layer having a saturation magnetic flux density B_{HB1} and a thickness less than that of a layer of said upper magnetic core not in contact with said magnetic gap, one end of said layer extending to an end of said thin film magnetic head which confronts said recording medium, and

wherein a saturation magnetic flux density B1 of a magnetic material of said layer of said upper magnetic core not in contact with said magnetic gap, and a saturation magnetic flux density B2 of a magnetic material of said lower magnetic core are expressed by the following respective relationships:

$B_{HB1}>B1$, and $B_{HB1}>B2$

5,590,009

MAGNETIC DISK UNIT

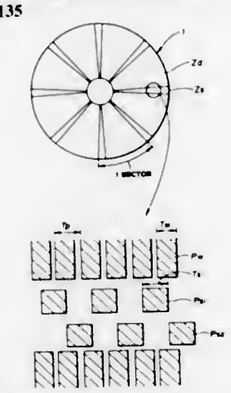
Takehisa Ishida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 126,456, Sep. 24, 1993, abandoned. This application May 19, 1995, Ser. No. 445,123

Claims priority, application Japan, Sep. 30, 1992, 4-285209

Int. Cl.[6] G11B *5/82*

U.S. Cl. 360—135 **20 Claims**



1. A magnetic disc unit, comprising:

a magnetic recording medium having a servo region and a data region alternately allocated, the servo region having a servo pattern with a servo pattern width Ts, the data region having a recording track pattern with a track pitch Tp and a recording track width Tw, having a step between a recording area and a non-recording area thereon;

a magnetic head with a magnetic writing width of Ww and a magnetic readout witdth of Wr;

wherein a relation between said recording track width Tw and said magnetic readout width Wr is Wr>Tw, while a relation between said recording track width Tw and said magnetic writing wideth Ww is Ww>Tw;

wherein a relation between said servo pattern width Ts and said track Tp is set to be $Tp(n-0.1) \leqq Ts \leqq Tp(n+0.1)$, where n is a positive, non-zero integer; and

wherein a relation between said magnetic readout width Wr and said track pitch Tp is set to be $0.9\,Tp \leqq Wr \leqq 1.1\,Tp$, wherein a dead zone in a tracking error signal produced from said magnetic recording medium is substantially eliminated.

5,590,010

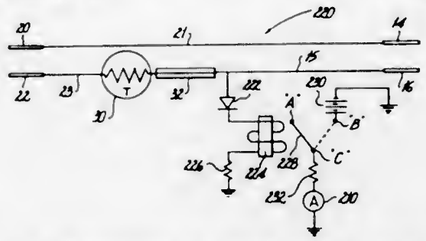
HEAT RESPONSIVE POWER INTERRUPTING DEVICE

Giacomo Ceola, Via Pastro 61/G, Villorba, Treviso, Italy; James K. McCusker, 12 Post La., Suffern, N.Y. 10901, and Giacomo Calzavara, 128 Surrey Ct., Ramsey, N.J. 07446

Filed Jul. 12, 1994, Ser. No. 274,097

Int. Cl.[6] H02H *5/04*

U.S. Cl. 361—93 **17 Claims**



1. A circuit coupled to an electrical socket for interrupting electrical power to an electric appliance, said circuit comprising:

(a) an input port for receiving electrical power from an electrical socket;

(b) an output port for delivering electrical power to an electric appliance, said outlet port accommodating plug blades of said electrical appliance;

(c) a first resettable switching element coupled to said input and output ports and operative to interrupt electrical power to said electric appliance in response to when either of said electrical socket or said plug blades of said electric appliance attains a first predetermined temperature; and

(d) a second resettable switching element coupled to said first resettable switching element and operative to interrupt electrical power to said electric appliance in response to when either of said electrical socket or said plug blades of said electric appliance attains a second predetermined temperature, wherein said second predetermined temperature is greater than said first predetermined temperature.

5,590,011

SHORT CIRCUIT PROTECTED SPLICE CONNECTOR

David A. Hein, Sterling Heights, Mich., assignor to Alcoa Fujikura Limited, Brentwood, Tenn.

Continuation of Ser. No. 150,967, Nov. 12, 1993. This application Jul. 27, 1995, Ser. No. 507,920

Int. Cl.[6] H02H *5/04*

U.S. Cl. 361—106 **1 Claim**

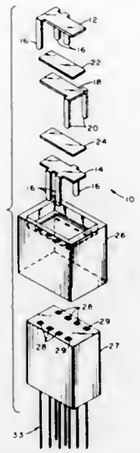
1. An electrical connector for connecting current receiving ends of a plurality of circuit wires together and to means having a positive temperature coefficient characteristic, comprising:

at least two electrically conductive members each having integral legs for electrical connection respectively to the current receiving ends of a first group of branch circuit wires and to a feed wire supplying electrical current to one of said electrically conductive members,

at least one member having a positive, temperature coefficient characteristic disposed between the two electrically conductive members and in electrical contact therewith including the integral legs of the electrically conductive members,

a housing for receiving said positive temperature coefficient and electrically conductive members including the legs of the electrically conductive members,

one of said electrically conductive members being effective to splice together the current receiving ends of the branch wires and electrically connect said wire ends to the member having a positive temperature coefficient characteristic such that the branch wires are connected to the feed wire through the member having the positive temperature coefficient characteristic when the feed wire is connected to a leg of the other electrically conductive member, and



a third electrically conductive member having integral legs, and a second member having a positive temperature coefficient characteristic placed between the third electrically conductive member and one of the two electrically conductive members for splicing current receiving ends of a second group of branch circuit wires to the second positive temperature coefficient characteristic member.

5,590,012

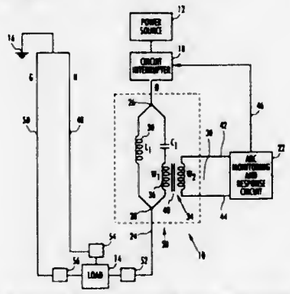
ELECTRIC ARC DETECTOR SENSOR CIRCUIT

Charles R. Dollar, II, Norcross, Ga., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 30, 1995, Ser. No. 413,304

Int. Cl.[6] H02H *3/46*

U.S. Cl. 361—113 **22 Claims**



1. An arc detection system for detecting arcing within an alternating current electrical circuit, the electrical circuit conducting a desired alternating current at a primary frequency, the system, comprising:

a first terminal;

a second terminal;

an inductor electrically coupled between the first and second terminals;

a capacitor electrically coupled to the first terminal;

a transformer including a primary winding magnetically coupled to a secondary winding, the primary winding being electrically coupled between the capacitor and the second terminal; and

an arc monitoring circuit electrically coupled to the secondary winding, the capacitor limiting current at the primary frequency from flowing through the primary winding, and the monitoring circuit detecting currents at frequencies different from the primary frequency and representative of arcing within the electrical circuit.

5,590,013

ELECTRIC-SUPPLY-SWITCH RELAY-CIRCUIT

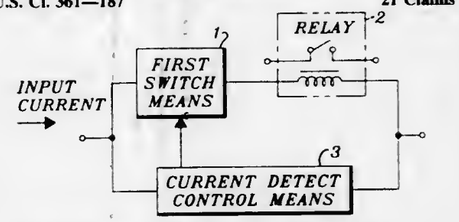
Shinichiro Harasawa, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Continuation of Ser. No. 99,188, Jul. 29, 1993, abandoned. This application Feb. 22, 1996, Ser. No. 605,655

Claims priority, application Japan, Nov. 30, 1992, 4-319825

Int. Cl.[6] H01H *47/22*

U.S. Cl. 361—187 **21 Claims**



1. An electric-supply-switch relay-circuit, comprising:

first switch means for passing an input current from an electric-supply line as a relay operating current; a relay for performing switching operations in accordance with said relay operating current provided via said first switch means;

and current detect control means for determining that said relay operating current is present, when an input current from said electric-supply line and flowing therethrough is determined to be equal to or larger than a predetermined value necessary for operating said relay,

said current detect control means turning on said first switch means to thereby pass said relay operating current flowing therethrough before turning on said first switch means to said relay.

5,590,014

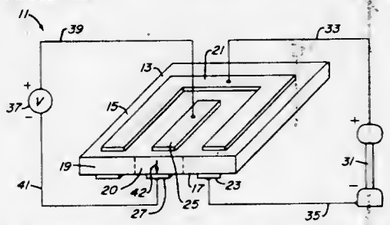
METHOD AND APPARATUS FOR SUPPLYING ELECTRIC POWER

Boyd B. Bushman, Lewisville, Tex., assignor to Lockheed Martin Corporation, Fort Worth, Tex.

Filed Mar. 16, 1995, Ser. No. 405,342

Int. Cl.[6] H01G *7/02*

U.S. Cl. 361—225 **20 Claims**



1. An apparatus for supplying electric power, the apparatus comprising in combination:

a central member of an electret material;

a pair of voltage input contacts electrically connected to and spaced apart on the central member;

static voltage means connected to the voltage input contacts for applying a static voltage potential across the voltage input contacts to create a current flow in the central member; and

a pair of voltage output contacts electrically connected to the central member, spaced apart from the voltage input contacts for receiving the current flow while the static voltage potential is being applied to the central member.

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5,590,015

VARIABLE CAPACITOR HAVING SAFETY END SWITCHES DISPOSED ON AN ADJUSTABLE SCREW AT END FACE OF CAPACITOR HOUSING

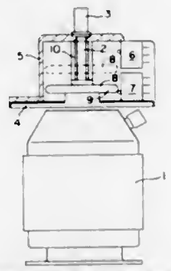
Andrea V. Planta, Oetwil, and Rolf Gerber, Kehrsatz, both of Switzerland, assignors to Comet Technik AG, Liebefeld, Switzerland

Filed Nov. 21, 1995, Ser. No. 561,005

Claims priority, application Switzerland, Nov. 21, 1994, 3503/94

Int. Cl.[6] H01G *5/00*

U.S. Cl. 361—277 **9 Claims**



1. A variable capacitor, in particular a vacuum capacitor, in which stationary capacitor disks and capacitor disks which are linearly displaceable with respect to said stationary capacitor disks; and disposed on a motor-driven screw are accommodated in a housing, and safety end switches and a position indicator device are associated to the displaceable capacitor disks, wherein the position indicator and the safety end switches are disposed on an adjusting screw at one of the end faces of the capacitor housing in a portion of said housing itself or in an additional flange-mounted housing.

5,590,016

MULTILAYER THROUGH TYPE CAPACITOR ARRAY

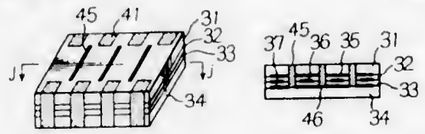
Yoshikazu Fujishiro; Takaya Ishigaki, both of Akita-ken, and Hiraku Harada, Yamagata-ken, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 356,834

Claims priority, application Japan, Dec. 16, 1993, 5-316577

Int. Cl.[6] H01G *4/20;4/34*

U.S. Cl. 361—313 **21 Claims**



1. A multilayer through type capacitor array having a rectangular parallelepiped shape, comprising a first dielectric sheet, a second dielectric sheet, a third dielectric sheet and a fourth dielectric sheet, each designed in rectangular form and placed in this order, on said first dielectric sheet a single first internal electrode made of conductive material, extended in longitudinal direction of the rectangle and reaching only the two shorter sides of the rectangle being provided, on said second dielectric sheet a plurality of second internal electrodes made of conductive material, extended in lateral direction of the rectangle and reaching the longer sides of the rectangle being provided, and on said third dielectric sheet, a single third internal electrode made of conductive material, extended in longitudinal direction of the rectangle and reaching the two shorter sides of the rectangle being provided, and a plurality of through type capacitors where said second internal electrodes are used as central conductor and said first internal electrode and said third internal electrode are used as external conductor, whereby:

a plurality of first holes are extended along said second internal electrodes between said plurality of second internal electrodes on said second dielectric sheet;

a plurality of second holes are formed on said first dielectric sheet, at positions corresponding to the positions where said first holes are formed;

a plurality of third holes are formed on said third dielectric sheet, at positions corresponding to the positions where said first holes are formed;

first conductive materials are filled in each of said plurality of first holes;

second conductive materials are filled in each of said plurality of second holes;

third conductive materials are filled in each of said plurality of third holes;

said first internal electrode is electrically connected to said first conductive materials;

said third internal electrode is electrically connected to said third conductive materials; and

said first, second and third conductive materials, placed at corresponding positions respectively, are electrically connected to form a plurality of inner shielding electrodes.

5,590,017

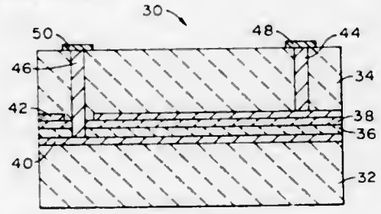
ALUMINA MULTILAYER WIRING SUBSTRATE PROVIDED WITH HIGH DIELECTRIC MATERIAL LAYER

John F. Kelso, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 3, 1995, Ser. No. 415,874

Int. Cl.[6] H01G *4/06;* **H05K** *1/00*

U.S. Cl. 361—321.4 **13 Claims**



1. A wiring substrate comprising:

a first alumina layer;

a first metallized layer on the first alumina layer;

a dielectric material layer on the first metallized layer;

a cermet layer on the dielectric material layer;

a second metallization layer on the cermet layer; and

a second alumina layer on the second metallized layer;

a first conductor electrically connecting to and extending from the second metallized layer through the second alumina layer; and

a second conductor electrically extending from the first metallized layer through the cermet layer and dielectric material layer, through but not electrically connecting the first metallized layer, and through the second alumina layer.

5,590,018

ARRANGEMENT OF ARRESTORS IN A GAS-INSULATED SWITCHGEAR

Satoshi Watahiki, and Shingo Shirakawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

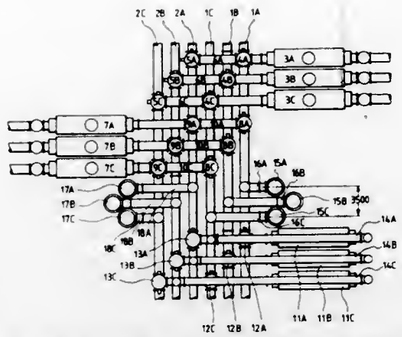
Filed Jul. 13, 1995, Ser. No. 501,878

Claims priority, application Japan, Jul. 25, 1994, 6-172271

Int. Cl.[6] H02B *1/04*

U.S. Cl. 361—612 **6 Claims**

1. A gas insulated switchgear, comprising:



a first set of isolated three-phase main buses disposed on a horizontal plane and running in a first direction;

a second set of isolated three-phase main buses disposed on said horizontal plane and running in parallel with said first set of isolated three-phase main buses;

a first set of gas insulated three-phase switchgear units disposed at a side of said first set of isolated three-phase main buses that is remote from said second set of isolated three-phase main buses;

three first connecting buses extending in a second direction perpendicular to the first direction, each of said first connecting buses connecting a respective one of said first set of isolated three-phase main buses and a respective one of said second set of isolated three-phase main buses with a respective one of said first set of gas insulated three-phase switchgear units of a corresponding phase via a respective disconnecting switch;

a second set of gas insulated three-phase switchgear units disposed at a side of said second set of isolated three-phase main buses that is remote from said first set of isolated three-phase main buses;

three second connecting buses extending in the second direction perpendicular to the first direction, each of said second connecting buses connecting a respective one of said first set of isolated three-phase main buses and a respective one of said second set of isolated three-phase main buses with one of said second set of gas insulated three-phase switchgear units of the corresponding phase via respective disconnecting switches;

a first set of first, second, and third isolated vertical type three-phase cylindrical arrestors disposed adjacent to said first set of gas insulated switchgear units and at the same side thereof with respect to said first set of isolated three-phase main buses, said first set of isolated vertical type three-phase cylindrical arrestors being arranged as three apices of a first triangle occupying said horizontal plane, wherein said second cylindrical arrestor of said first set of isolated vertical type three-phase cylindrical arrestors is located intermediate, along said first direction, of said first and third cylindrical arrestors of said first set of isolated vertical type three-phase cylindrical arrestors, a distance between said first and third cylindrical arrestors of said first set of isolated vertical type three-phase cylindrical arrestors in said first direction as a measurement axis being less than the diameter of said second cylindrical arrestor of said first set of isolated vertical type three-phase cylindrical arrestors;

three first leading-out buses extending in the second direction, each connecting one of said first set of isolated three-phase main buses with one of said first set of isolated vertical type three-phase cylindrical arrestors of a corresponding phase;

a second set of first, second, and third isolated vertical type three-phase cylindrical arrestors disposed adjacent to said second set of gas insulated switchgear units and at the same side thereof with respect to said second set of isolated three-phase main buses, said second set of isolated vertical type three-phase cylindrical arrestors being arranged as three apices of a second triangle occupying said horizontal plane, wherein said second cylindrical arrestor of said second set of isolated vertical type three-phase cylindrical arrestors is located intermediate, along said first direction, of said first and third cylindrical arrestors of said second set of isolated vertical type three-phase cylindrical arrestors, a distance between said first and third cylindrical arrestors of said second set of isolated vertical type three-phase cylindrical arrestors in said first direction as a measurement axis being less than the diameter of said second cylindrical arrestor of said second set of isolated vertical type three-phase cylindrical arrestors; and

three second leading-out buses extending in the second direction, each connecting one of said second set of isolated three-phase main buses with one of said second set of isolated vertical type three-phase cylindrical arrestors of a corresponding phase.

5,590,019

DEVICE FOR CHANGE-OVER SWITCHING OF INDIVIDUAL ELECTRIC MOTORS OR GROUPS OF ELECTRIC MOTORS

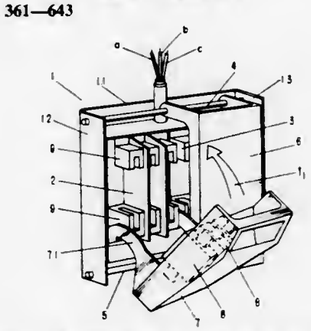
Siegfried Fox, Xanten, and Andreas Keil, Krefeld, all of Germany, assignors to Palitex Project-Company GmbH, Krefeld, Germany

Filed Nov. 17, 1995, Ser. No. 560,319

Claims priority, application Germany, Nov. 19, 1994, 44 41 209.6

Int. Cl.[6] H02B *1/04*

U.S. Cl. 361—643 **2 Claims**



1. A device for change-over switching of electric motors, said device comprising:

a housing;

two safety disconnecting switch systems positioned adjacently to one another in said housing;

a cover slidably connected to said housing so as to cover one of said safety disconnecting switch systems respectively;

a fuse holder detachably connected to said housing;

fuses connected to said fuse holder;

each one of said safety disconnecting switch systems comprising receiving means for receiving said fuses;

said safety disconnecting switch systems electrically connected to one another such that upon insertion of said fuses into said receiving means of one of said safety disconnecting switch systems the electric motors rotate in one direction of rotation and that upon insertion of said fuses into said receiving means of the other one of said safety disconnecting switch systems the electric motors rotate in the other direction of rotation; and

wherein said fuse holder is detachably connected to said housing adjacent to said cover such that said cover covers one of said safety disconnecting switch systems and that said fuses are inserted into the receiving means of the other one of said safety disconnecting switch systems.

2. A device according to claim 1, wherein:

said housing is U-shaped and comprises a base and two legs;

said safety disconnecting switch systems are connected to said base;

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said housing further comprising two rods connected to said legs so as to extend parallel to one another between said legs; and

said cover displaceably guided on said rods.

5,590,020

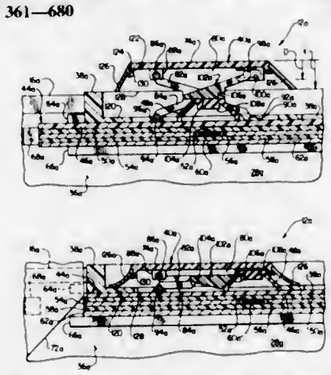
COLLAPSIBLE NOTEBOOK COMPUTER KEYBOARD STRUCTURE WITH RESILIENTLY DEFLECTABLE KEY CAP SKIRTS

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 268,818, Jun. 30, 1994, Pat. No. 5,532,904. This application Jul. 18, 1995, Ser. No. 503,869

Int. Cl.[6] **G06F** *1/16;* **H01H** *3/12;* **B41J** *11/56;* **H05K** *7/04*

U.S. Cl. 361—680 **23 Claims**



1. A collapsible keyboard structure for a portable computer, comprising:

a first support structure having top and bottom side portions;

a series of key cap members each carried on said top side portion of said first support structure for vertical movement relative thereto, through a vertical key stroke distance, between extended and retracted positions separated by a vertical distance greater than said key stroke vertical distance,

each of said key cap members having a relatively rigid top side portion with a horizontal periphery, and a resiliently deflectable skirt portion anchored and extending around said periphery and extending downwardly and horizontally outwardly therefrom;

a second support structure carried beneath said first support structure and having a top side facing said bottom side of said first support structure; and

a spaced series of resilient key return members anchored to said second support structure and having top end portions projecting upwardly beyond said top side of said second support structure,

said first and second support structures being horizontally shiftable relative to one another between a first position in which said key return members underlie and resiliently hold said key cap members in said extended positions thereof and permit said key cap members to be resiliently moved downwardly from said extended positions through said key stroke distance, and a second position in which said key return members are horizontally shifted relative to said key cap members in a manner permitting said key cap members to be forcibly moved downwardly from said extended positions thereof to said retracted positions thereof without vertically compressing said resilient key return members,

said resilient skirt portions of said key cap members bearing against and being deflected horizontally outwardly by said bottom side portion of said first support structure when said key cap members are in said retracted positions thereof.

5,590,021

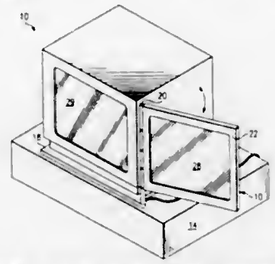
SECONDARY DISPLAY SYSTEM FOR COMPUTER

David S. Register, 4202 Sandy Acre La., Austin, Tex. 78746

Filed Jul. 16, 1993, Ser. No. 92,846

Int. Cl.[6] **G06F** *1/16;* **H05K** *7/02*

U.S. Cl. 361—681 **9 Claims**



1. A secondary display system for a computer, the system comprising:

a flat panel display;

a display controller electrically connected between said computer and said flat panel display for interfacing said flat panel display to said computer;

means connected to said flat panel display for positioning said flat panel display relative to said computer, said positioning means defining an axis on which said flat panel display is rotatable; and

means connected to said positioning means for mounting said system on said computer;

wherein said computer comprises a computer chassis and a monitor disposed on a top surface thereof, said mounting means comprising a substantially planar plate interposed between said chassis and said monitor.

5,590,022

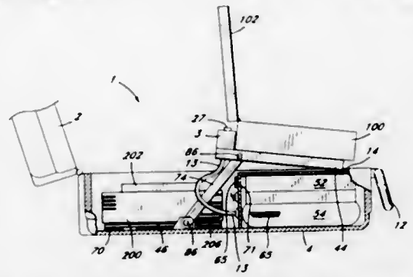
SHIELDED MODULAR PORTABLE COMPUTER WORK STATION HAVING CABLE ROUTING MEANS

Stephen Harvey, Las Cruces, N.M., assignor to The I.D.E.A. Corporation, Las Cruses, N.M.

Filed May 19, 1995, Ser. No. 444,704

Int. Cl.[6] **G06F** *1/16;* **H05K** *5/02*

U.S. Cl. 361—683 **20 Claims**



16. A modular portable work station including a carrying case and a computer, a printer and at least one computer peripheral transported within the carrying case, said carrying case having a body and a cover movable to opened and closed positions relative to the body, said work station comprising;

a source of electric power;

electric cable means to connect said source of electric power to each of said computer and said at least one computer peripheral;

a computer tray located within said carrying case body to support the computer thereon;

a channel attached to said computer tray;

means by which to move said computer tray and said channel attached thereto relative to said carrying case body;

at least one first and at least one second electrical connector mounted on said channel means; and

means by which to electrically couple said electric cable means to said at least one first and second electrical connectors;

said at least one first electrical connector adapted to be attached to said computer and said at least one second electrical connector adapted to be attached to said at least one computer peripheral.

5,590,023

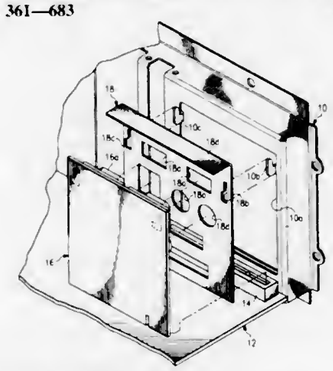
COMPUTER APPARATUS FOR SUSPENSION OF COMPUTER EXPANSION CARDS

Gilberto Hernandez, 16707 Simsbrook Dr.; Russell C. Smith, P.O. Box 1156, both of Pflugerville, Tex. 78691, and Daniel Bouvier, 7101 Figvine Cove, Austin, Tex. 78750

Filed Jul. 26, 1995, Ser. No. 507,619

Int. Cl.[6] **G06F** *1/16;* **H05K** *7/04;7/10;* **H01R** *13/74*

U.S. Cl. 361—683 **16 Claims**



1. Computer apparatus comprising:

an expansion card for suspension in a computer chassis relative to a planar, said planar having a connector for connecting to said card;

a hanger extending from said chassis; and

an interface plate secured to said card and having an opening therein such that said hanger extends through said opening when said card is connected to said connector and said hanger engages said interface plate through said opening to support said card away from said planar when said card is disconnected from said connector.

5,590,024

PORTABLE ELECTRONIC APPARATUS HAVING A PLURALITY OF CARD STORAGE PORTIONS FOR REMOVABLY HOUSING A MEMORY CARD

Masami Honda, and Kazuaki Kawabata, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

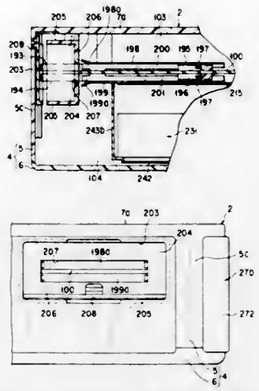
Filed May 6, 1994, Ser. No. 239,255

Claims priority, application Japan, Jun. 21, 1993, 5-149544

Int. Cl.[6] **G06F** *1/16;* **H05K** *7/16*

U.S. Cl. 361—684 **4 Claims**

1. A portable electronic apparatus wherein a plurality of card-like electronic components are loaded/unloaded therethrough comprising:



a case having a bottom surface, an upper surface opposing the bottom surface, and a peripheral surface continuous with the bottom surface and the upper surface, the peripheral surface having a card insertion port formed therein;

a circuit board housed in said case to be parallel to the bottom surface and the upper surface, said circuit board having upper and lower surfaces; and

first and second card storage portions which are respectively arranged on the upper and lower surfaces of said circuit board said first and second card storage portions being arranged so as to oppose each other across said circuit board and respectively having an opening portions continuous with said insertion port, said card-like electronic components being removably housed in said first and second card storage portions through said insertion port and said opening portions, and said card-like electronic components being parallel to said circuit board, when said card-like electronic components are housed in said first and second card storage portions.

5,590,025

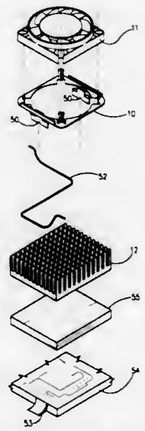
FAN ATTACHMENT CLIP FOR HEAT SINK

Donald Clemens, The Colony, Tex., assignor to Thermalloy, Inc., Dallas, Tex.

Filed Jun. 7, 1995, Ser. No. 482,011

Int. Cl.[6] **H05K** *7/20*

U.S. Cl. 361—695 **15 Claims**



1. A clip for securing a heat sink having upstanding parallel fins to a fan for cooling said heat sink comprising:

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a frame having a width adapted to be wedged between said fins of said heat sink;

means adapted to secure said fan to said frame including upstanding corner posts on said frame adapted to engage said fan to secure it to said frame; and

a blade extending downwardly from said frame adapted to bear against said fins to secure said frame to said heat sink, said blade having a downwardly facing arcuate cut-out which accommodates a wire clip adapted for securing said heat sink to a socket.

5,590,026

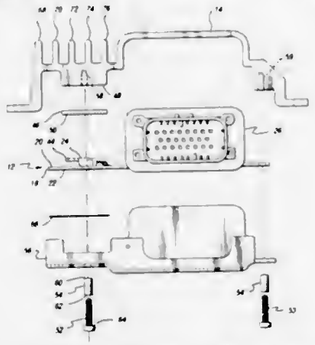
APPARATUS FOR DISSIPATING HEAT FROM AN INTEGRATED CIRCUIT

James D. Warren, Clayton; Carl R. Vogt, and Charles D. Klooz, both of Raleigh, all of N.C., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Jul. 31, 1995, Ser. No. 509,597

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—704 **12 Claims**



1. An apparatus dissipating heat from an integrated circuit which is connected to a printed circuit board having first and second sides, the apparatus comprising:

a support member having first and second sides, said first side of said support member being directly connected to the first side of the circuit board for supporting the integrated circuit with respect to the circuit board;

a plurality of electrical connectors in electrical communication with the integrated circuit and surface-mounted on the first side of the circuit board;

a metal tab in thermal communication with the integrated circuit and extending from said support member in a plane spaced from and substantially parallel to said circuit board and substantially coplanar with said second side of said support member;

an electrically insulating thermally conductive compressible pad positioned in contact with said metal tab which receives heat from said tab; and

a thermally conductive housing positioned adjacent said pad which compresses said pad against said tab and receives heat from said pad, said housing including a plurality of fins extending therefrom for heat dissipation, and wherein said housing is positioned opposing the first side of the circuit board.

5,590,027

TECHNIQUE PROVIDING BRIDGE FOR CONNECTING MODULAR UNITS

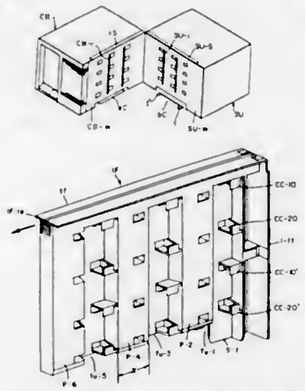
Ronald A. Provenzale, Fremont, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 223,270, Apr. 4, 1994, Pat. No. 5,421,739, which is a division of Ser. No. 4,031, Jan. 15, 1993, Pat. No. 5,304,077, which is a division of Ser. No. 746,456, Nov. 12, 1991, Pat. No. 5,267,873. This application May 31, 1995, Ser. No. 454,905

The portion of the term of this patent subsequent to Dec. 7, 2010, has been disclaimed.

Int. Cl.[6] H01R *13/639;* **F16B** *12/00*

U.S. Cl. 361—732 **11 Claims**



1. In a computer array, a connection arrangement for removably connecting a prescribed base machine to a like associated satellite machines, each machine having at least one join-face with electrical plug-in connector means thereon, this arrangement comprising:

coupling means comprising a thin, planar structure presenting a pair of opposed like couple-sides, each side having coupling means;

said base machine and said satellite machine, each having at least one join-face characterized by rib-guide means and attachment means thereon; each attachment means being disposed to correspond with a respective one of said coupling means when join-faces of said base and satellite machines are located in closely-opposed registering relation to one another, being coplanar, aligned and separated by a prescribed gap governed by said connector means, said coupling means being adapted to be removably engaged with both confronting join-faces via said respective coupling means engaging said attachment means, after being inserted therebetween, guided by said rib-guide means.

5,590,028

MEMORY CARD ASSEMBLY HAVING IMPROVED MEANS FOR GROUNDING PRINTED WIRING BOARD AND METHOD OF USE

Paul M. Duncan, Durham, N.C., assignor to Berg Technology, Inc., Reno, Nev.

Filed Sep. 30, 1994, Ser. No. 315,439

Int. Cl.[6] H05K *1/14*

U.S. Cl. 361—737 **27 Claims**

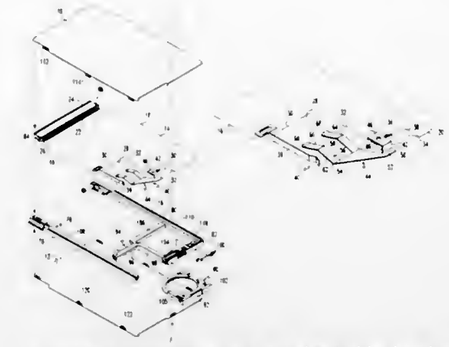
1. A printed wiring board and memory card assembly comprising:

(a) a pair of opposed cover plates;

(b) a printed wiring board interposed between said opposed cover plates;

(c) an electrical power source comprising an electrical battery;

(d) a positive terminal connecting the printed wiring board with the electrical power source;



(e) a negative terminal connecting the printed wiring board with the power source and with both of the opposed cover plates wherein the opposed cover plates comprise a first cover plate and a second cover plate and the battery has a negative electrode and a positive electrode and the negative terminal has a first section and a second section and is fixed to the printed wiring board at an attachment area interposed between said first and second sections and said first section of said negative terminal extends from said attachment area to contact the first cover plate and said second section of the negative terminal extends from said attachment area to contact the second cover plate and the negative electrode of said battery and the second section of the negative terminal contacts the positive electrode of said battery.

5,590,029

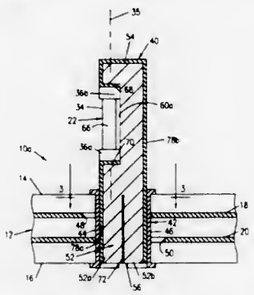
CIRCUIT BOARD SMT DEVICE MOUNTING APPARATUS

H. Scott Estes, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jan. 12, 1995, Ser. No. 371,720

Int. Cl.[6] H05K *7/02*

U.S. Cl. 361—760 **19 Claims**



1. Circuit board apparatus comprising:

a dielectric substrate member having opposite first and second side surfaces;

spaced apart first and second electrically conductive structures carried by said substrate member;

a through hole extending through said substrate member and opening outwardly through said first and second side surfaces, said through hole having an interior side surface;

spaced apart first and second electrically conductive plating segments disposed on said interior side surface of said through hole and respectively coupled to said first and second electrically conductive structures;

an adapter structure extending along a longitudinal axis, said adapter structure having a first longitudinal portion coaxially received in said through hole, a second longitudinal portion extending outwardly from said through hole, a depression formed in said second longitudinal portion, and first and second electrically isolated exterior portions respectively and conductively coupled to said first and second plating segments; and

an SMT type electronic component secured within said depression of said adapter structure and having opposite electrically conductive first and second end sections respectively and conductively coupled to said first and second plating segments of said through hole through said first and second electrically isolated exterior portions of said adapter structure.

5,590,030

CIRCUIT BOARD CAPABLE OF EFFICIENTLY CONDUCTING HEAT THROUGH AN INSIDE THEREOF USING THERMAL LANDS SURROUNDING THROUGH-HOLE CONNECTIONS

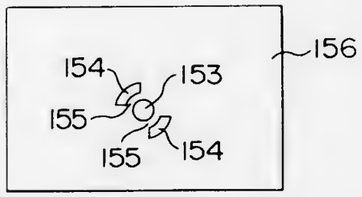
Masatsugu Kametani, and Kazuhiro Umekita, both of Ibaraki-ken, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 29,919, Mar. 11, 1993, Pat. No. 5,371,653, which is a continuation of Ser. No. 462,778, Jan. 10, 1990, abandoned. This application Aug. 17, 1994, Ser. No. 291,893

Claims priority, application Japan, Jan. 13, 1989, 1-004923

Int. Cl.[6] H05K *7/20;1/11*

U.S. Cl. 361—794 **5 Claims**



1. A circuit board apparatus comprising:

a mother board including a ground or power supply layer having a ground or power supply potential-defining plane;

at least one circuit board including at least one ground or power supply layer having a ground or power supply potential-defining plane, the circuit board being mounted on the mother board in such a manner that the at least one ground or power supply layer of the circuit board is contacted respectively to the corresponding ground or power supply layer of the mother board; and

an electronic circuit unit mounted on the circuit board and having at least one terminal connected to the circuit board, the electronic circuit unit being adapted to generate heat upon operation thereof;

wherein a thermal resistance of connection of the ground or power supply layer of the circuit board with the terminal of the electronic circuit unit is adjusted to be a low level to conduct therethrough an excess part, other than a part removed from surface of the electronic circuit unit, of heat generated from the electronic circuit unit, and

wherein the ground or power supply layer in the circuit board is thick enough to conduct therethrough the excess part of heat to be diffused over an area wide enough to be removed, a part of the diffused heat over the ground or power supply layer of the circuit board being removed therefrom by fluid which flows along a surface of the circuit board, an other part of the diffused heat over the ground or power supply layer of the circuit board being further conducted from the ground or power supply layer of the circuit board to the ground or power supply layer of the mother board to be further diffused to be removed therefrom.

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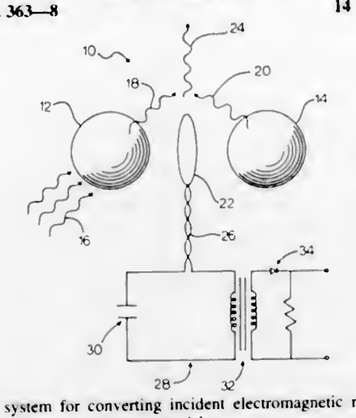
5,590,031
SYSTEM FOR CONVERTING ELECTROMAGNETIC RADIATION ENERGY TO ELECTRICAL ENERGY

Franklin B. Mead, Jr., 44536 Avenida Del Sol, Lancaster, Calif. 93535, and Jack Nachamkin, 12314 Teri Dr., Poway, Calif. 92064

Filed Jul. 27, 1994, Ser. No. 281,271
Int. Cl.[6] H02M *1/00*
U.S. Cl. 363—8 **14 Claims**



1. A system for converting incident electromagnetic radiation energy to electrical energy, comprising:

a first means for receiving incident primary electromagnetic radiation, said means for receiving producing emitted secondary electromagnetic radiation at a first frequency, said first means for receiving having a first volumetric size selected to resonate at a frequency within the frequency spectrum of the incident primary electromagnetic radiation in order to produce the secondary electromagnetic radiation at the first frequency at an enhanced energy density;

a second means for receiving the incident primary electromagnetic radiation, said means for receiving producing emitted secondary electromagnetic radiation at a second frequency, the secondary radiation at the first frequency and the secondary radiation at the second frequency interfering to produce secondary radiation at a lower frequency than that of the incident primary radiation, said second means for receiving having a second volumetric size selected to resonate at a frequency within the frequency spectrum of the incident primary electromagnetic radiation in order to produce the emitted secondary electromagnetic radiation at the second frequency at an enhanced energy density;

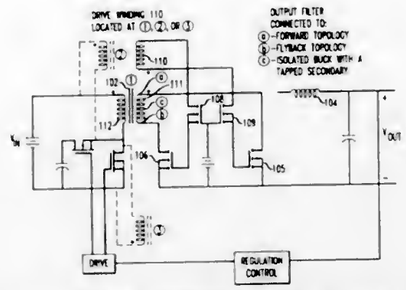
an antenna for receiving the emitted secondary electromagnetic radiation at the lower frequency, said antenna providing an electrical output responsive to the secondary electromagnetic radiation received;

a converter electrically connected to said antenna for receiving electrical current output from said antenna and converting the electrical current output to electrical current having a desired voltage and waveform.

5,590,032
SELF-SYNCHRONIZED DRIVE CIRCUIT FOR A SYNCHRONOUS RECTIFIER IN A CLAMPED-MODE POWER CONVERTER

Wayne C. Bowman, Allen, and Van A. Niemela, Dallas, both of Tex., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 25, 1995, Ser. No. 452,560
Int. Cl.[6] H02J *1/00;* **H02M** *3/00*
U.S. Cl. 363—15 **28 Claims**



3. A DC to DC power converter, comprising:

a power transformer having a primary winding and a secondary winding;

a primary circuit for connecting an input DC voltage to the primary winding and including, a power switch and a circuit that reverses the polarity of the secondary voltage during a portion of the period of non-conduction of the power switch sufficient to ensure the reset of the transformer magnetic core;

a secondary circuit for coupling energy transfer from the secondary winding to an output and including, a low pass output filter connected to the output and a synchronous rectifier connecting the secondary winding to the low pass output filter;

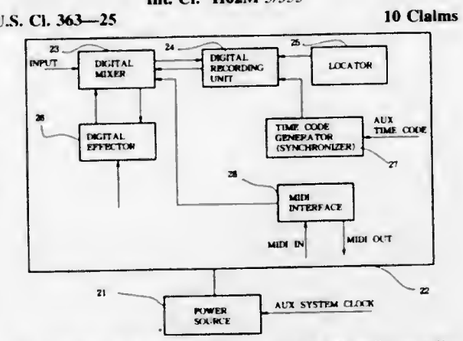
the synchronous rectifier including;

first and second synchronous rectifier switches each controlled by a signal applied to an included control electrode, first and second voltage limit switch devices connected to limit a voltage of drive signals applied to the first and second synchronous rectifier switches and a drive winding connected to alternately energize the first and second synchronous rectifier switches.

5,590,033
POWER SOURCE APPARATUS

Toshihiko Kawano, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 705,102, May 24, 1991, abandooed, which is a continuation-in-part of Ser. No. 397,575, Aug. 23, 1989, abandoned. This application Mar. 16, 1993, Ser. No. 32,728
Claims priority, application Japan, Sep. 2, 1988, 63-115037
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—25 **10 Claims**



1. A power source apparatus for use in a digital audio recording apparatus, the digital audio recording apparatus including a variable speed drive being driven by an external sampling dock signal having a frequency used in digital audio equipment, wherein the speed of the drive varies in accordance with the external sampling clock signal, the power source apparatus comprising:

a DC power source;

a switching arrangement coupled to the DC power source for switching at a variable switching frequency to provide a DC output signal;

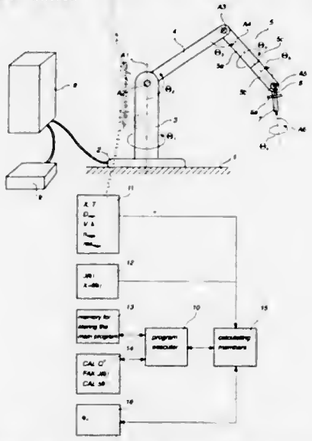
clock means for providing a clock signal substantially at the external sampling clock frequency; and

a controller, responsive to the clock signal having the external sampling clock frequency, for controlling the switching frequency of the switching arrangement to be about an integer multiple of the external sampling clock frequency.

5,590,034
METHOD FOR CONTROLLING THE MOVEMENT OF AN INDUSTRIAL ROBOT AT AND NEAR SINGULARITIES

John-Erik Snell, Västerås, Sweden, assignor to ASEA Brown Boveri AB, Västerås, Sweden

Filed Feb. 13, 1995, Ser. No. 387,231
Claims priority, application Sweden, Feb. 21, 1994, 9400579
Int. Cl.[6] G06F *19/00;* **G05B** *19/18*
U.S. Cl. 364—167.01 **8 Claims**



1. A method for controlling an industrial robot such that a tool supported by the robot can follow a path determined by a number of consecutive points, and wherein the robot while following the path ends up near or at a singularity, said robot having a plurality of movement axes (A1–A6) and the configuration of the robot being determined by the angles of rotation (θ_1–θ_6) of the movement axes, the ratio of the angular velocities of the axes to the velocity of the tool being given by a Jacobian matrix, the angles of rotation which the robot is to assume in order to obtain the correct position and orientation for the tool at the next point on the path being calculated as follows:

a) setting start values of the angles of rotation,

b) calculating the errors in the position and orientation of the tool in relation to the desired position and orientation for the start values,

c) calculating the total error,

d) calculating new start values, based on the errors in the position and orientation of the tool,

e) allowing steps b–d to constitute an iteration and repeating it until the total error is lower than a tolerance value for the total error,

characterized in that the iteration comprises the following steps:

f) determining with the aid of the Jacobian matrix whether the robot is at or near a singularity,

g) if the robot is at or near a singularity, carrying out the steps of:

1) identifying those axes which are singular and setting their joint angle values to their start values,

2) weighting the errors in the position of the tool in relation to the errors in the orientation of the tool by a weighting factor (V),

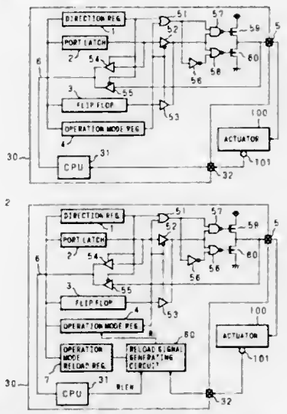
3) increasing the tolerance value for the total error by a tolerance factor (k) such that it exceeds the tolerance for the total error for points outside the singularities,

4) based on the weighted errors, calculating new start values for the next iteration.

5,590,035
OUTPUT CONTROL CIRCUIT

Takehiko Shimomura, and Takashi Miyake, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 354,168
Claims priority, application Japan, Dec. 24, 1993, 5-327766
Int. Cl.[6] G05B *11/01*
U.S. Cl. 364—177 **8 Claims**



1. An output control circuit comprising:

an output terminal connected with at least two kinds of different signal sources;

first storing means for storing information specifying one of the signal sources from which a signal is outputted by said output terminal derives;

a circuit for making a signal output from said output terminal according to the information stored in said first storing means;

second storing means for storing the information to be stored in said first storing means;

reload signal generating means for generating a reload signal; and

reloading means for reloading the information stored in said second storing means to said first storing means, when the reload signal is generated by said reload signal generating means.

5,590,036
FAILURE-RECOVERING SEQUENTIAL PROCEDURE TEACHING SYSTEM AND METHOD THEREOF

Noboru Maeda, Chiryu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 1, 1995, Ser. No. 457,281
Claims priority, application Japan, Jun. 1, 1994, 6-120404
Int. Cl.[6] G05B *9/02*
U.S. Cl. 364—184 **10 Claims**

1. A failure-recovering sequential procedure teaching system comprises:

a failure removal data recording section which records as a set of failure removal data an associated-portion state data representing prescribed associated-portion states at the time when the equipment to be controlled is in failure and a recovery

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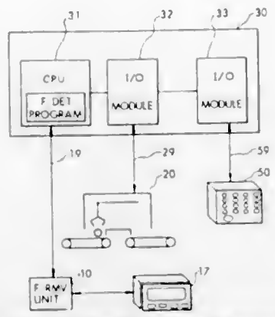


sequence data representing a recovery sequencial procedure with which an operator performs his recovering operation;

a failure removal data analysis section which selects one or a plurality of associated-portion state data items corresponding to the same recovery sequence data among a plurality of sets of failure removal data and groups them as data of the same recovery sequence data, analizes said associated-portion state data in each recovery sequence group to produce failure-characterizing data typically representing the characteristics of the relevant failure state, and records the failure-characterizing data as the data paired with the corresponding recovery sequence data; and

a recovery sequence determination section which compares the corresponding associated-portion state data with each item of the failure-characterizing data as stored to determine the degree of match between an item of said corresponding associated-portion state data when a new piece of failure occurs and outputs the recovery sequence data corresponding to a high match-degree item of the failure-characterizing data.

5,590,037

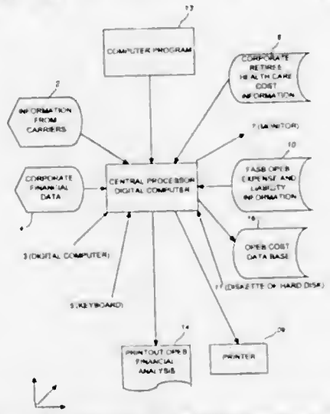
DIGITAL COMPUTER SYSTEM AND METHODS FOR COMPUTING A FINANCIAL PROJECTION AND AN ILLUSTRATION OF A PREFUNDING PROGRAM FOR AN EMPLOYEE BENEFIT

Raymond B. Ryan, Darien, Conn., and Noah F. Gans, New York, N.Y., assignors to The Evergreen Group Incorporated, Stamford, Conn.

Filed Sep. 17, 1993, Ser. No. 123,312

Int. Cl.[6] G06F *157/00*

U.S. Cl. 395—204 **42 Claims**



1. A method implemented on a machine comprising an electrical digital computer having a processor programmed to electrically process input data into output data, the digital computer being electrically connected to a keyboard and to a printer, the method comprising the steps of:

entering a first forecast of an employee benefit at the keyboard to convert the entered first forecast into a portion of the input data that is electrically conveyed to the digital electrical computer to electrically process;

entering a second forecast of a segregated and restricted investment subject to an indenture agreement at the keyboard to convert the entered second forecast into an other portion of the input data that is electrically conveyed to the digital computer to electrically process;

engaging the digital computer to process the input data add to generate the output data that is electrically conveyed to the printer, the output data representing an illustration of the segregated and restricted investment subject to an indenture agreement providing prefunding for the employee benefit; and

printing said illustration at the printer from the electrically conveyed output data.

5,590,038

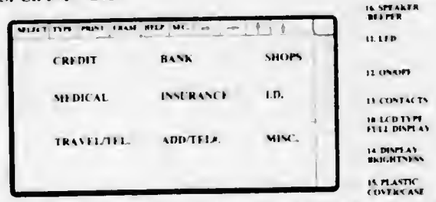
UNIVERSAL ELECTRONIC TRANSACTION CARD INCLUDING RECEIPT STORAGE AND SYSTEM AND METHODS OF CONDUCTING ELECTRONIC TRANSACTIONS

Satyan G. Pitroda, 1480 Golden Bell Ct., Downers Grove, Ill. 60515

Filed Jun. 20, 1994, Ser. No. 262,307

Int. Cl.[6] G06F *17/60*

U.S. Cl. 395—241 **24 Claims**



1. A universal electronic transaction card for storing, transmitting, and receiving information, including personal information for a user of the universal electronic transaction card, account information for accounts with service institutions in which the user has an account, and transactional information for accounts with service institutions in which the user has an account, for a plurality of service institutions comprising

a. housing means for housing inputting means, memory means, communications means, display means, and processing means, the housing means adapted to fit in a pocket or purse;

b. inputting means for inputting information, including personal information for the user, account information for a plurality of service institutions in which the user has an account, and transactional information for each service institution for which account information exists, into the memory means;

c. memory means for storing information, including personal information for the user, account information for a plurality of service institutions in which the user has an account, and transactional information for each service institution for which account information exists;

d. communications means for electronically communicating information, including personal information, account information, and transactional information, with service institutions;

e. display means for displaying a replica of a card corresponding to a selected service institution and for displaying information for a plurality of service institution accounts, including personal information, account information, and transactional information;

f. processing means for processing information, including personal information, account information, and transactional information; and

g. means for providing and storing electric power.

5,590,039

NATURAL LANGUAGE PROCESSING APPARATUS AND METHOD FOR PERFORMING PROCESSING TO ANALYZE THE MEANING OF AN INPUT SENTENCE ENTERED IN THE FORM OF A NATURAL LANGUAGE

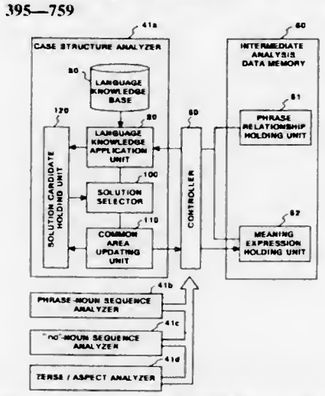
Yuji Ikeda, and Minoru Fujita, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 982,070, Nov. 25, 1992, abandoned, which is a continuation of Ser. No. 594,954, Oct. 10, 1990, abandoned. This application Aug. 29, 1994, Ser. No. 296,159

Claims priority, application Japan, Oct. 14, 1989, 1-267515

Int. Cl.[6] G06F *17/28*

U.S. Cl. 395—759 **6 Claims**



1. A natural language processing apparatus for performing processing to analyze the meaning of an input sentence entered in the form of a natural language, comprising:

memory means for storing subjects of analysis;

input means for applying the input sentence, which is an initial one of the subjects of analysis, to said memory means;

a plurality of meaning analyzing means for analyzing the meaning of the input sentence, each of said plurality of meaning analyzing means performing different meaning analyzing operations, and being capable of outputting a result of its analysis to said memory means to update a subject of a subsequent analysis; and

control means for sending a subject of analysis stored in said memory means to each of said plurality of meaning analyzing means when the subject of analysis is updated in said memory means,

wherein each of said plurality of meaning analyzing means determines whether respective meaning analysis is executable with regard to the subject of analysis sent by said control means and sends a result of the determination to said control means, and

wherein if at least one of the plurality of meaning analyzing means sends a determination that an analysis of the subject of analysis is executable, said control means selects one from among said at least one of the plurality of meaning analyzing means on the basis of the results of the determination sent by said plurality of meaning analyzing means and causes the selected one of said plurality of meaning analyzing means to perform a meaning analysis on the subject of analysis is sent by said control means and output a result of its meaning analysis to said memory means to update the subjects of analysis.

5,590,040

SELF-DIAGNOSIS APPARATUS FOR VEHICLE

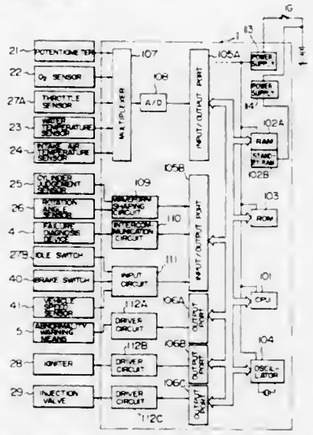
Takahide Abe, Kariya, and Katsumi Takaba, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 17, 1993, Ser. No. 107,154

Claims priority, application Japan, Aug. 19, 1992, 4-242804

Int. Cl.[6] G06F *17/00*; **G01M** *15/00*

U.S. Cl. 364—424.04 **12 Claims**



1. A self-diagnosis apparatus for a vehicle for detecting and storing data of vehicle conditions, detecting a possible abnormality of equipment mounted on the vehicle, and for outputting stored data for diagnosis of the possible abnormality, said apparatus comprising:

a plurality of sensors each for detecting and outputting, during operation of equipment mounted on the vehicle, a value of a respective ones of predetermined parameters representative of vehicle operating conditions;

means for dividing a predetermined region of output values of each of said sensors into a plurality of subregions;

means for determining into which of said subregions values of each of the parameters output by the sensors fall;

memory means for storing data and for updating the stored data, said memory means including a plurality of storage regions corresponding in number to said subregions, each of said storage regions storing therein a period of time during which values of the parameters are in the subregion corresponding to the storage region, as determined by said determining means;

abnormality detecting means for detecting an abnormality of equipment; and

fixing means for causing said memory means to fixedly store data of said memory means when an abnormality is detected by said abnormality detecting means.

5,590,041

TRACK TRENCHER STEERING SYSTEM AND PROCESS

Mark R. Cooper, Pella, Iowa, assignor to Vermeer Manufacturing Company, Pella, Iowa

Filed Jul. 29, 1994, Ser. No. 282,878

Int. Cl.[6] B62D *11/22*; **F16H** *37/14*

U.S. Cl. 364—424.051 **22 Claims**

1. A system for steering a track trencher including an engine coupled to left and right track drives, the system comprising:

left and right track pumps for powering the left and right track drives respectively;

means for producing a travel mode signal indicative of one of a plurality of track trencher travel modes;

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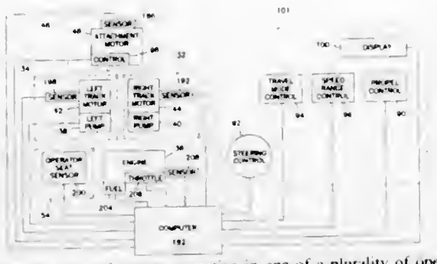


steering control means, operative in one of a plurality of operating modes in response to the travel mode signal, for producing a steering signal associated with one of the plurality of travel modes; and

computer control means for controlling the left and right track pumps in one of the plurality of track trencher travel modes to effect track trencher steering changes in response to the steering signal.

5,590,042

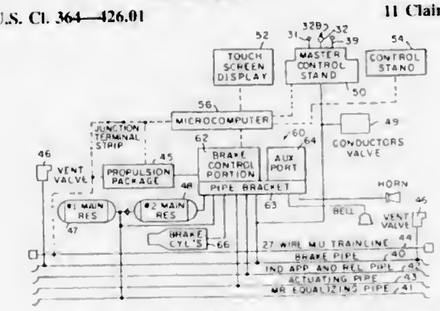
INDEPENDENT BRAKE CONTROL

John J. Allen, Jr., Watertown, and Kevin B. Root, Black River, both of N.Y., assignors to New York Air Brake Corporation, Watertown, N.Y.

Continuation-in-part of Ser. No. 204,450, Feb. 7, 1994, Pat. No. 5,412,572, which is a continuation of Ser. No. 984,100, Dec. 1, 1992, abandoned, which is a continuation of Ser. No. 447,816, Dec. 8, 1989, Pat. No. 5,172,316. This application Feb. 22, 1995, Ser. No. 392,211

Int. Cl.[6] **B60T** *13/68*

U.S. Cl. 364—426.01 **11 Claims**



1. A computerized locomotive control system for a locomotive having a brake pipe and at least an independent application and release pipe and a brake cylinder, said system comprising:

input means for receiving electrical signals representing braking control signals from at least an independent application and release controller and said independent application and release pipe and electrical signals representing leading and trailing modes;

computer means for determining desired pipe pressure signals for all of said pipes in response to said braking control signals and determining a brake cylinder control signal only in said leading mode and not in said trailing mode in response to both said braking control signals from said independent application and release controller and said independent application and release pipe; and

means for controlling pressure in all of said pipes and said brake cylinder in response to said desired pipe pressure signals and said brake cylinder control signal.

5,590,043

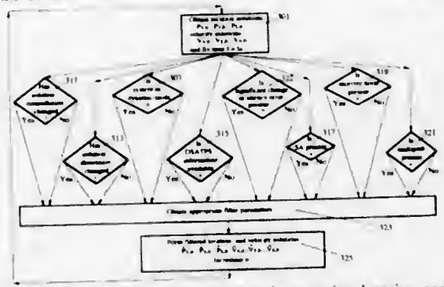
SATELLITE POSITIONING SYSTEM FILTER

Paul W. McBurney, Santa Clara, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Jun. 17, 1993, Ser. No. 78,512

Int. Cl.[6] **G06F** *165/00;* **G01S** *5/02*

U.S. Cl. 364—449.1 **23 Claims**



1. A method for filtering and using time-varying location coordinates $P_{x,n}$, $P_{y,n}$ and $P_{z,n}$ determined by a Satellite Positioning System (SATPS), which operates in a static mode and in a dynamic mode, to determine the location of a mobile user of the SATPS and to reduce large discontinuities and control the rate at which a changing sequence of measurement errors can induce change in a sequence of the user's location solution coordinates, the method comprising the steps of:

(1) Setting an integer n=1 initially, using a location determination system (LDS), having an LDS antenna and an LDS receiver/processor that is connected to the LDS antenna and that includes a computer, to receive a plurality of SATPS signals and to generate initial location coordinate fixes $P_{x,n}$, $P_{y,n}$, and $P_{z,n}$, for n=1, initializing a first selected group of variables, including a weight coefficient or gain factor α_n ($0 \leq \alpha_n \leq 1.0$; initially $\alpha_1=1.0$), used for controlling the relative weighting of a new unfiltered location fix at a location fix time $t=t_n$ with a predicted value computed as the previous filtered position at time t_{n-1} and projected forward to the present time with the average velocity at time t_n and t_{n-1}; a steady state value α_{SS} of the gain ($0<\alpha_{SS}<1$), used when the difference between the new location fix and predicted location fix, known as the prediction error, is small; a minimum value α_{min} of the gain ($0<\alpha_{min}<1$), used when the prediction error is too high so that clamping of the gain is activated; a value α_{exp} of the gain ($0<\alpha_{exp}<1$), to be used in a partial expansion mode of the system when the predicted location based on the average velocity may not allow an accurate estimate of the present location solution coordinates; a value α_0 ($0<\alpha_0 \leq 1$), used for the gain upon reset when large gaps in time occur between consecutive fix times t_n, or when the prediction error is too large, or when a large improvement in location accuracy occurs between consecutive location fixes; a counting integer N (≥ 1), used for counting consecutive fixes in a static mode; a selected location error threshold PE_{thr}; a maximum allowable location error PE_{max}; a maximum allowed time interval length Δt_{max} during which no satellite signal measurements are received; a selected initial value of a variable, clamp_active(n), which is >0 if clamping is active, <0 if the system is in a partial expansion mode, and =0 in a normal dynamic mode; a selected initial value of a variable, static_count(n), used for counting the number of consecutive location fixes with velocity less than a threshold velocity $V_{h,thr}$ that is required for entry into the static mode; a selected value $\beta_{i,l,n}>1$, used to control the incremental increase of the variable α_n toward a steady state value α_{SS} from a state in which clamping is present, where α_{SS} =a selected positive value r30; and a selected value β_{SS} ($0<\beta_{SS}<1$), used to control a second approach of the variable α_n from a reset value α(reset) toward a steady state value α_{SS} in a normal dynamic mode of the SATPS, defining initial filtered location coordinates $P^{\wedge}_{x,1}=P_{x,1}$, $P^{\wedge}_{y,1}=P_{y,1}$ and $P^{\wedge}_{z,1}=P_{z,1}$, and proceeding to step (46);

(2) for $n \geq 2$, using the LDS antenna and the LDS receiver/proceessor to receive a plurality Of SATPS signals and to generate new location coordinate fixes $P_{x,n}$, $P_{y,n}$, and $P_{z,n}$, new velocity coordinate fixes $V_{x,n}$, $V_{y,n}$, and $V_{z,n}$ that are independent of any previous fix information received, a new time coordinate t_n for the time of this location fix, and values for variables last $\alpha(n)=\alpha_{n-1}$, last latency=L_{n-1}, static last fix(n)=1 if the preceding location fix (n−1) was in the static mode and =0 otherwise, last_hvel(n)=$V_{h,n-1}$, last_acc_mode(n)=acc_mode(n−1), last_fix_dim(n) = fix_dim(n−1), and last_$\Delta t_m(n)=\Delta t_m(n-1)$ for variables computed for the preceding location fix;

(3) computing the horizontal component $V_{h,n}$ of velocity and the change in horizontal velocity $\Delta V_{h,n}=|V_{h,n}-V_{h,n-1}|$ from the data obtained in step (2);

(4) choosing a first set of values of filter variables including: req_static_count=a selected positive value r13, a selected value of static_count required for entry into the static mode; a selected present value of do_static(n), which=1 if the static mode is activated, and=0 otherwise; a selected present value of a variable fix_dim(n)=2 or 3, according to whether the available SATPS geometry allows a 2-dimensional horizontal solution or a 3-dimensional location solution; a selected present clamping value $\alpha_{c,l,n}$ of the gain, with $0<\alpha_{c,l,n}<1$, to be used when the prediction error is too high; a selected present value for a variable, new_clamp(n), which=1 if clamping is activated at the nth fix, and=0 otherwise; a selected present value of a variable new_fix_set(n), which=1 if a dimension change (2-dimensional to 3-dimensional or 3-dimensional to 2-dimensional) or a satellite constellation change occurred at the nth fix, and=0 otherwise; a selected present value of a variable DSATPS_ON(n), which=1 if differential satellite positioning system information is available at the time of the nth fix, and =0 otherwise; a selected present value of a variable SA_OFF(n), which=1 if Selective Availability is inactivated at the time of the nth fix, and=0 otherwise; a selected present value for a variable acc_mode(n), which is equal to the logical or Boolean sum; {DSATPS_ON(n)) OR (SA_OFF(n))}; a selected present value of a variable, PDOP(n), representing the predicted dilution-of-precision determined from SATPS signals received from a selected constellation of SATPS satellites; a selected present value of a variable $\Delta t_m(n)=\max\{t_n-t_{m1}, t_n-t_{m2}, \ldots, t_n-t_{mM}\}$, where t_{mi} is the time of the most recent pseudorange measurement made from the i-th satellite that forms part of the satellite solution constellation at time t_n, with $t_{mi} \leq t_n$ (i=1, 2, . . . , M); and a selected value of a variable, B2G(n), that determines when the gain α_n is to be reset if a selected condition is true;

(5) determining if acc_mode(n)=1 at the nth fix; when acc_mode(n)=1, setting the following values for the indicated variables: $N_{min}(n)$=r1, $N_{max}(n)$= r2, $V_{h,thr}(n)$=r3 (m/sec), $\Delta V_{h,thr}(n)$=r4 (m/sec), $\beta_{i,l,n}$=r5, and $\sigma_{meas}(n)$= r6, $\sigma_{pos}(n)$=PDOP(n)×$\sigma_{meas}(n)$; when acc_mode(n)=0, setting the following values for the indicated variables: $N_{min}(n)$=r7, $N_{max}(n)$=r8, $V_{h,thr}(n)$=r9 (m/sec), $\Delta V_{h,thr}(n)$=r10 (m/sec), $\beta_{i,l,n}$=r11, $\sigma_{meas}(n)$=r12, and $\sigma_{pos}(n)$=PDOP(n)×$\sigma_{meas}(n)$, where r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11 and r12 are selected positive values with r1 ≦r7, r2≦r8, r3≦r9, r4≦r10, r5≧r11> 1, and r6—r12;

(6) setting do static(n)=0;

(7) testing if the horizontal velocity is below the static mode threshold by determining if the condition $V_{h,n}<V_{h,thr}$ is true; when $V_{h,n}<V_{h,thr}$ is true, incrementing static_count(n) by 1 and proceeding to step (8); otherwise, continuing to step (8);

(8) determining if static mode was active in the last fix by determining if {(static_last_fix(n)=1) AND ($\Delta V_{h,n}<\Delta V_{h,thr}$)} is true; when this condition is satisfied, setting do_static(n)=1, setting clamp_active(n)=0, and proceeding to step (13); otherwise, continuing to step (9);

(9) determining if static mode was active in the last fix; if {static last fix(n)=1) AND ($\Delta V_{h,n}<\Delta V_{h,thr}$)} is true, setting static count(n) =0; if {(static last fix(n)=1) AND ($\Delta V_{h,n} \geq \Delta V_{h,thr}$)} is true, or if {static last fix(n)≠1) AND (static count(n)=req static count)} is true, setting do static(n)=1 and setting clamp active(n)=0; if {static last fix(n)≠1) AND (static count(n)≠req static count)} is true, continuing to step (10);

(10) determining if do_static(n)=1; when this condition is satisfied, setting last_hvel(n+1)=$V_{h,n}$, setting $V_{x,n}=V_{y,n}=V_{z,n}=0$, replacing N by max(N, N_{min}) and proceeding to step (12); otherwise proceeding to step (11);

(11) determining if static_last_fix(n)=1; when this condition is not satisfied, proceeding to step (12); otherwise, setting new_clamp(n)=1, setting end_static_count(n)=a selected positive integer r14, where end_static_count(n) is a countdown integer used for exiting from the static mode, and continuing to step (12);

(12) setting $\Delta t_n=t_{n-1}$;

(13) determining if do_static(n)=1; when this condition is satisfied, setting $P^{\wedge}_{x,n}{}^{-}=P^{\wedge}_{x,n-1}$, $P^{\wedge}_{y,n}{}^{-}=P^{\wedge}_{y,n-1}$ and $P^{\wedge}_{z,n}{}^{-}=P^{\wedge}_{z,n-1}$; Otherwise, setting $P^{\wedge}_{x,n}{}^{-}=P^{\wedge}_{x,n-1}+(V_{x,n}+V_{x,n-1})\,\Delta t_n/2$, setting $P^{\wedge}_{y,n}{}^{-}=P^{\wedge}_{y,n-1}+(V_{y,n}+V_{y,n-1})\Delta t_n/2$ and setting $P^{\wedge}_{z,n}{}^{-}=P^{\wedge}_{z,n-1}+(V_{z,n}+V_{z,n-1})\,\Delta T_n/2$;

(14) computing $PE_n=\max\{|P_{x,n}-P^{\wedge}_{x,n}{}^{-}|, |P_{y,n}-P^{\wedge}_{y,n}{}^{-}|, |P_{z,n}-P^{\wedge}_{z,n}{}^{-}|\}$;

(15) computing $\delta V_n=\max\{|V_{x,n}-V_{x,n-1}|, |V_{y,n}-V_{y,n-1}|, |V_{z,n}-V_{z,n-1}|\}$;

(16) computing $\Delta t_L(n)=\max\{\Delta t_n, \Delta t_m(n), \Delta t_m(n-1)\}$;

(17) determining if $\Delta t_n \geq \Delta t_{max}$, where Δt_{max}=a selected positive value r28; when this condition is satisfied, proceeding to step (25); otherwise, continuing to step (18);

(18) determining if $PE_n \geq PE_{max}$; when this condition is satisfied, proceeding to step (25); otherwise, continuing to step (19);

(19) determining if {(fix_dim(n)=3) AND (first_3D_fix(n)=1)} is true; when this condition is satisfied, proceeding to step (25); otherwise, continuing to step (20);

(20) determining if B2G(n)≠1; when this condition is satisfied, proceeding to step (24); otherwise, continuing to step (21);

(21) determining if {(first_DSATPS_fix(n)=1) AND (acc_mode(n−1)= 1)} is true; when this condition is satisfied, proceeding to step (25); otherwise, continuing to step (22);

(22) determining if {(PDOP(n)<r15 PDOP(n−1)) AND (fix_dim(n)= fix_dim(n−1)) AND (PDOP(n−1)≧r16)} is true, where r15 and r16 are selected positive values; when this condition is satisfied, proceeding to step (25); otherwise, continuing to step (23);

(23) determining if {($PE_n \geq$r17 $\sigma_{pos}(n)$) AND (fix_dim(n)=3) AND (fix_dim(n−1)=2)} is true, where r17 is a selected positive value; when this condition is satisfied, continuing to step (25); otherwise, continuing to step (24);

(24) setting reset_filter(n)=0 and proceeding to step (26);

(25) setting reset_filter(n)=1, and setting the gain α_n equal to the value α_0;

(26) determining if {(clamp_active(n)>0) AND (α_{SS} $PE_n<PE_{thr}$/r18) AND (end_static_count(n)=0)} is true, where r18 is a selected positive value; when this condition is satisfied, setting clamp_active(n)=0; otherwise, continuing to step (27);

(27) determining if {(clamp_active(n)<0) AND ($PE_n \geq$r19 last_latency)} is true, where r19 is a selected positive value; when this condition is satisfied, setting clamp_active(n)=0; otherwise, continuing to step (28);

(28) determining if $PE_n \geq PE_{thr}$; if the condition is not met, proceeding to step (45); otherwise, continuing to step (29);

(29) computing a latency variable $L_n=\delta V_n\ \Delta t_L(n)/2$, to estimate the maximum location error that has occurred due to presence of non-zero acceleration;

(30) replacing the latency L_n by min(L_n, r20), where r20 is a selected positive value;

(31) determining if PE_n<r21 L_n, where r21 is a selected positive value; when this condition is not satisfied, proceeding to step (33); otherwise, continuing to step (32);

(32) determining if {{(acc_mode(n)=0) AND ($L_n \geq$r22)} OR {acc_mode(n)=1 AND $L_n \geq$r23 }}is true; when this condition is satisfied, setting clamp_active(n)=−r24, setting last_latency=L_n, and proceeding to step (35), where r22, r23 and r24 are selected positive values; otherwise, continuing to step (33);

(33) determining if $\alpha_n PE_n<PE_{thr}$; when this condition is not satisfied, continuing to step (35); otherwise, continuing to step (34);

(34) determining if (clamp_active(n)=0) OR {(new_fix_set(n)=1) AND (clamp_active(n)>0)} is true; when this condition is satisfied, setting new_clamp(n)=1; otherwise, continuing to step (35);

(35) determining if reset_filter(n)=1; when this condition is not satisfied, continuing to step (36); otherwise, setting $\alpha=\alpha_0$, setting clamp_active(n)=0, setting end_static_count(n)=0, setting N=N_{min}, and proceeding to step (45);

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(36) determining if new_clamp(n)=1; when this condition is not satisfied, proceeding to step (40); otherwise, continuing to step (37);

(37) determining if do_static(n)=1; when this condition is not satisfied, proceeding to step (39); otherwise, continuing to step (38);

(38) setting $N=[r25\ PE_n]_{int}$, where r25 is a selected positive value, replacing N by $\min(N, N_{max})$, setting $\alpha_n=1/N$, setting clamp_active(n)=0, and proceeding to step (45);

(39) setting $\alpha_{i,n}=K_n/PE_n$, setting $\alpha_n=\max(\alpha_{i,n}, \alpha_{min})$, where α_{min} is a selected small positive value r29, setting clamp_active (n)= R_n, where K_n and R_n are selected positive numbers that may depend on n, and proceeding to step (45);

(40) determining if clamp_active(n)>0; when this condition is not satisfied, proceeding to step (43); otherwise, continuing to step (41);

(41) setting $\alpha_n=J_n$, replacing α_n by $\max(\alpha_{n-1}, \alpha_{SS})$, and setting clamp_active(n)=clamp_active(n)−1, where J_n is a selected positive number that depends upon n;

(42) determining if end_static_count(n)>0; when this condition is satisfied, setting end_static_count(n)=end_static_count(n)−1 and proceeding to step (45); otherwise, continuing to step (43);

(43) determining if clamp_active(n)<0; when this condition is not satisfied, continuing to step (44); otherwise, setting $\alpha_n=\alpha_{exp}$, where α_{exp} is a selected positive value r31, setting clamp_active(n)=clamp_active(n)+1, and proceeding to step (45);

(44) determining if do_static(n)=1; when this condition is satisfied, setting N=N+1, replacing N by $\min(N, N_{max})$, setting $\alpha_n=1/N$, and continuing to step (45); otherwise, setting $\alpha_n=\beta_{SS}(\alpha_{n-1}$, where β_{SS} is a selected positive value r32, replacing α_n by $\max(\alpha_n, \alpha_{SS})$, and continuing to step (45);

(45) computing filtered location coordinates $P^{\wedge}_{x,n}$, $P^{\wedge}_{y,n}$ and $P^{\wedge}_{z,n}$ by the relations

$P^{\wedge}_{x,n}=\alpha_n P_{x,n}+(1-\alpha_n)P^{\wedge}_{x,n}^{-}$,

$P^{\wedge}_{y,n}=\alpha_n P_{y,n}+(1-\alpha_n)P^{\wedge}_{y,n}^{-}$,

$P^{\wedge}_{z,n}=\alpha_n P_{z,n}+(1-\alpha_n)P^{\wedge}_{z,n}^{-}$;

(46) setting last $\alpha=\alpha_n$, last latency=L_n, last PDOP =PDOP(n), last_hvel(n+1)=$V_{h,n}$, last_acc_mode(n+1)=acc_mode(n), last_fix_dim(n+1)=fix_dim(n) and last_Δt_m(n+1)=Δt_m(n);

(47) replacing integer n by n+1;

(48) returning to step (2) at least once; and

(49) causing the LDS receiver/processor to assist the mobile SATPS user in navigating from a first selected location to a second selected location by replacing the location coordinates ($P_{x,n}$, $P_{y,n}$, $P_{z,n}$) by the filtered location coordinates ($P^{\wedge}_{x,n}$, $P^{\wedge}_{y,n}$, $P^{\wedge}_{z,n}$) and by displaying these filtered location coordinates for at least one mobile user location other than the first and second selected locations.

5,590,044

METHOD AND APPARATUS FOR FINDING AIRCRAFT POSITION BY INTEGRATING ACCELERATIONS LESS TIME AVERAGES

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Filed Feb. 2, 1995, Ser. No. 382,532

Claims priority, application Germany, Feb. 2, 1994, 44 03 190.4

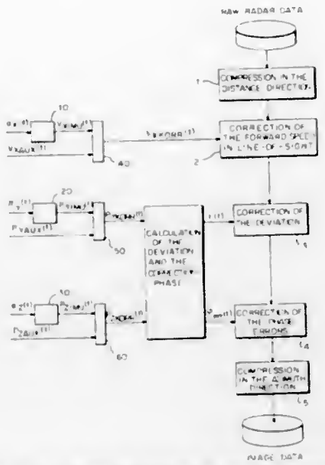
Int. Cl.[6] **G01S** *13/90;* **G06F** *17/10*

U.S. Cl. 364—453 **4 Claims**

1. A method for determining the position of an aircraft for radar mapping, comprising:

providing a processor in the airplane;

providing a master navigation system coupled to the processor and including an aircraft speedometer for measuring a forward x-speed $v_{XUAX}(t)$, a lateral horizontal position sensor for measuring a lateral y-position $p_{YUAX}(t)$, and an altimeter for measuring a vertical z-position $p_{ZUAX}(t)$;



providing a slave system including an inertial measurement unit coupled to the processor and further including an x-accelerometer for generating a forward-direction horizontal acceleration signal $a_x(t)$, a y-accelerometer for generating a lateral horizontal acceleration signal $a_y(t)$, and a z-accelerometer for generating a vertical acceleration signal $a_z(t)$;

(a) inputting the forward-direction acceleration signal $a_x(t)$ from the inertial system to the processor;

time-averaging over a time interval T the acceleration signal $a_x(t)$ to obtain a first x-adjustment $fheighta_x(t)$;

subtracting the first x-adjustment $fheighta_x(t)$ from the acceleration signal $a_x(t)$ to obtain an adjusted acceleration signal $a'_x(t)$;

integrating the adjusted acceleration signal $a'_x(t)$ over the interval T to obtain a velocity $v_x''(t)$ according to

$$v''_x(t)=\int_0^t [a_x(t)-\overline{a_x(t)}]dt \tag{2}$$

time-averaging the velocity $v''_x(t)$ over the interval T to obtain a v_x-adjustment $fheightv_x(t)$;

subtracting the v_x-adjustment $fheightv_x(t)$ from the velocity $v''_x(t)$ to obtain a forward airplane speed $v_{XIMU}(t)$ in the desired flight direction according to

$$v_{XIMU}(t)=v_x(t)-v''_x(t) \tag{5}$$

estimating by method of least squares, from a difference between the speed $v_{XIMU}(t)$ and the speed measurement of the speedometer, an average acceleration $\hat{a}_{X0}$ and an average speed $\hat{v}_{X0}$;

creating a correction term $v_{XFIT}(t)$ from a sum of the average speed $\hat{v}_{X0}$ and a time integration of $\hat{a}_{X0}$ according to

$$v_{X_{FIT}}(t)=\int_0^t \hat{a}_{X_0}\,dt+v_{X_0}= \tag{19}$$

$$=\hat{a}_{X_0}t+v_{X_0} \tag{20}$$

correcting the speed $v_{XIMU}(t)$ in the desired flight direction by adding the correction term $v_{XFIT}(t)$ thereto to obtain a corrected flight speed $v_{XKORR}(t)$ according to

$$v_{XKORR}(t)=v_{XIMU}(t)+v_{XFIT}(t)$$

(b) inputting the lateral-direction acceleration signal $a_y(t)$ from the inertial system to the processor;

time-averaging over a time interval T the acceleration signal $a_y(t)$ to obtain a first y-adjustment $fheighta_y(t)$;

subtracting the first y-adjustment $fheighta_y(t)$ from the acceleration signal $a_y(t)$ to obtain an adjusted acceleration signal $a'_y(t)$;

integrating the adjusted acceleration signal $a'_y(t)$ over the interval T to obtain a velocity $v_y''(t)$ according to

$$v''_y(t)=\int_0^t [a_y(t)-\overline{a_y(t)}]dt \tag{6}$$

time-averaging the velocity $v''_y(t)$ over the interval T to obtain a v_y-adjustment $fheightv_y(t)$;

subtracting the first y-adjustment $fheightv_y(t)$ from the velocity $v''_y(t)$ to obtain an adjusted velocity signal $v'_y(t)$;

integrating the adjusted velocity signal $v'_y(t)$ over the interval T to obtain a position $p_y'(t)$ according to

$$p'_y(t)=\int_0^t [v'_y(t)-\overline{v'_y(t)}]dt \tag{8}$$

time-averaging the position $p'_y(t)$ over the interval T to obtain a p_y-adjustment $fheightp_y(t)$;

subtracting the p_y-adjustment $fheightp_y(t)$ from the velocity $p'_y(t)$ to obtain a forward airplane speed $p_{YIMU}(t)$ in the desired flight direction according to

$$p_{YIMU}(t)=p'_y(t)-fheightp'_y(t) \tag{9}$$

estimating by method of least squares, from a difference between the speed $p_{YIMU}(t)$ and the speed measurement of the speedometer, an average acceleration $\hat{a}_{Y0}$ and an average speed $\hat{v}_{Y0}$;

creating a correction term $p_{YFIT}(t)$ from a sum of the average speed $\hat{v}_{Y0}$ and a time integration of $\hat{a}_{Y0}$ according to

$$p_{Y_{FIT}}(t)=\int_0^t\int_0^t \hat{a}_{Y_0}\,dt^2+\int_0^t \hat{v}_{Y_0}\,dt+\hat{p}_{Y_0}=$$

$$=\frac{\hat{a}_{Y_0}}{2}t^2+\hat{v}_{Y_0}t+\hat{p}_{Y_0}$$

correcting the speed $p_{YIMU}(t)$ in the desired flight direction by adding the correction term $p_{YFIT}(t)$ thereto to obtain a corrected flight speed $p_{YKORR}(t)$ according to

$$p_{YKORR}(t)=p_{YIMU}(t)+p_{YFIT}(t)$$

correcting the motion of the aircraft along the desired flight path according to the value of $p_{YKORR}(t)$;

(c) inputting the lateral-direction acceleration signal $a_z(t)$ from the inertial system to the processor;

time-averaging over a time interval T the acceleration signal $a_z(t)$ to obtain a first z-adjustment $fheighta_z(t)$;

subtracting the first z-adjustment $fheighta_z(t)$ from the acceleration signal $a_z(t)$ to obtain an adjusted acceleration signal $a'_z(t)$;

integrating the adjusted acceleration signal $a'_z(t)$ over the interval T to obtain a velocity $v_z''(t)$ according to

$$v''_z(t)=\int_0^t [a_z(t)-\overline{a_z(t)}]dt \tag{12}$$

time-averaging the velocity $v''_z(t)$ over the interval T to obtain a v_z-adjustment $fheightv_z(t)$;

subtracting the first z-adjustment $fheightv_z(t)$ from the velocity $v_z(t)$ to obtain an adjusted velocity signal $v'_z(t)$;

integrating the adjusted velocity signal $v'_z(t)$ over the interval T to obtain a position $p_z'(t)$ according to

$$p'_z(t)=\int_0^t [v'_z(t)-\overline{v'_z(t)}]dt \tag{14}$$

time-averaging the position $p'_z(t)$ over the interval T to obtain a p_z-adjustment $fheightp_z(t)$;

subtracting the p_z-adjustment $fheightp_z(t)$ from the velocity $p''_z(t)$ to obtain a forward airplane speed $p_{ZIMU}(t)$ in the desired flight direction according to

$$p_{ZIMU}(t)=p'_z(t)-fheightp'_z(t) \tag{15}$$

estimating by method of least squares, from a difference between the speed $p_{ZIMU}(t)$ and the speed measurement of the speedometer, an average acceleration $\hat{a}_{Z0}$ and an average speed $\hat{v}_{Z0}$;

creating a correction term $p_{ZFIT}(t)$ from a sum of the average speed $\hat{v}_{Z0}$ and a time integration of $\hat{a}_{Z0}$ according to

$$p_{Z_{FIT}}(t)=\int_0^t\int_0^t \hat{a}_{Z_0}\,dt^2+\int_0^t \hat{v}_{Z_0}\,dt+\hat{p}_{Z_0}= \tag{27}$$

$$=\frac{\hat{a}_{Z_0}}{2}t^2+\hat{v}_{Z_0}t+\hat{p}_{Z_0} \tag{28}$$

correcting the speed $p_{ZIMU}(t)$ in the desired flight direction by adding the correction term $p_{ZFIT}(t)$ thereto to obtain a corrected flight speed $p_{ZKORR}(t)$ according to

$$p_{ZKORR}(t)=p_{ZIMU}(t)+p_{ZFIT}(t) \tag{29}$$

and

compensating the radar mapping according to the values of $v_{XKORR}(t)$, $p_{YKORR}(t)$, and $p_{ZKORR}(t)$.

5,590,045

CONTROL SYSTEM FOR A PRODUCTION MACHINE, ESPECIALLY A RING-SPINNING MACHINE

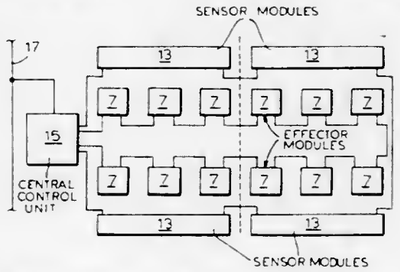
Hartmut Kaak, Ebersbach/Fils, and Andreas Neuendorf, Boll, both of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

Filed Feb. 13, 1995, Ser. No. 388,222

Claims priority, application Germany, Feb. 17, 1994, 44 05 088.7

Int. Cl.[6] **G06F** *19/00;* **G05B** *21/02*

U.S. Cl. 364—470.1 **15 Claims**



1. A spinning machine comprising:

a multiplicity of spinning stations each receiving a supply of sliver, having means for spinning said sliver into yarn and having a sliver-stopping device arranged in a row;

a multiplicity of terminal elements including

at least one sensor element at each station monitoring yarn continuity and producing a sensor signal representing a yarn failure, and

an effector element at each station for operating the respective sliver-stopping device in response to at least one effector signal; and

control circuitry for said elements for evaluating said sensor signals and generating said effector signals, said control circuitry comprising:

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a central control unit,

a multiplicity of similar first control modules spaced along the row, each of said first control modules being connected to a plurality of said sensor elements and including means for evaluating said sensor signals and means for communicating data between said first modules and between one of said first modules and said central unit, and a multiplicity of similar second control modules spaced along the row, each of said second control modules being connected to a plurality of said effector elements and including means for generating said effector signals and means for communicating data between said second modules and between one of said second modules and said central unit, and

means for connecting said first modules of the row serially in at least one chain and for connecting said second module serially in at least one other chain, and means for connecting said chains independently to said central unit for data transfer from each chain to said central unit from one module through another module in succession along each chain and, conversely, for data transfer from said central unit to each chain being effected from one module through another module in succession along the respective chain, whereby interruption of each chain automatically reconfigures flow of data from the interrupted chain to said central unit and from said central unit through the respective chain.

5,590,046

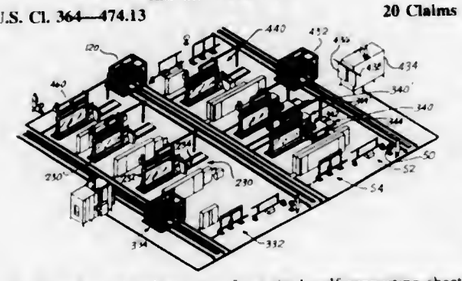
AUTOMATED FLOOR PANEL WORKCELL

Thomas Q. Anderson, Seattle; Garth W. Broadrick, Spokane; Merrill A. Christianson, Puyallup; Daniel A. Hippe; Arthur T. Hughes, both of Auburn; Jagdish C. Kalyan, Bothell; Daniel L. Nydegger, Auburn; Robert C. Platt, Seattle, and Karapurath Ramachandran, Maple Valley, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 609,180, Oct. 31, 1990, Pat. No. 5,247,477. This application Apr. 1, 1993, Ser. No. 42,347

Int. Cl.[6] G05B *19/18*

U.S. Cl. 364—474.13 **20 Claims**



1. A method of making parts from rigid, self-supporting sheet material, comprising:

creating a virtual nest of parts on a space equal to a standard sheet of said rigid sheet material;

loading a working sheet of said rigid sheet material having said standard size, on edge, into a CNC machine;

in said CNC machine, cutting at least one reference cut into said working sheet for future indexing;

moving said working sheet, on edge, to a second CNC machine and indexing said working sheet, on edge, to a known position on said second CNC machine using said reference cut;

positioning a tool of a second CNC machine precisely at a predetermined position on said working sheet using said reference cut as a reference, and performing additional operations on said working sheet in said second CNC machine; and

cutting the periphery of each nested part on said working sheet to separate said parts from said working sheet.

5,590,047

INFORMATION PROCESSING APPARATUS

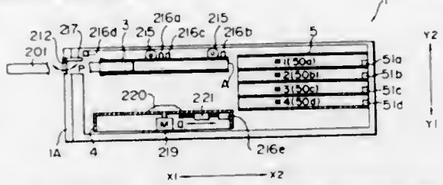
Nagatoshi Uehara, Tokyo, Japan, assignor to Clarion Co., Ltd., Saitame-ken, Japan

Filed Aug. 2, 1994, Ser. No. 284,358

Claims priority, application Japan, Aug. 5, 1993, 5-212160; Aug. 5, 1993, 5-212161

Int. Cl.[6] G06F *17/00;* **G11B** *15/68; 17/22*

U.S. Cl. 364—478.02 **21 Claims**



1. An information processing apparatus for performing a predetermined processing to the information recorded in a recording medium inserted into said apparatus, said apparatus including a plurality of storing positions capable of storing the recording medium and a holding member (3) movable between a processing position at which said predetermined processing is performed and positions opposed to each of said storing positions for holding the recording medium, said information processing apparatus comprising:

first designating means for initially designating one of said plurality of storing positions to which the recording medium is to be stored;

second designating means for independently designating one of said plurality of storage positions at which the inserted recording medium is to be located; and

determining means for determining the position designated by said second designating means as a position at which the recording medium is to be located when such a position is available and said second designating means has designated a position other than the initial position of the first designating means.

5,590,048

BLOCK EXPOSURE PATTERN DATA EXTRACTING SYSTEM AND METHOD FOR CHARGED PARTICLE BEAM EXPOSURE

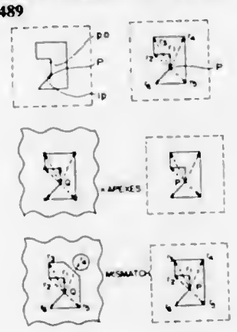
Tomohiko Abe; Hiroshi Yasuda; Kiichi Sakamoto, and Yoshihisa Oae, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 4, 1993, Ser. No. 71,262

Claims priority, application Japan, Jun. 5, 1992, 4-145833; Jun. 8, 1992, 4-147655; Sep. 21, 1992, 4-251224

Int. Cl.[6] G06F *17/50;* **G06K** *9/00*

U.S. Cl. 364—489 **42 Claims**



1. A pattern extracting apparatus which is applied to a charge-particle beam exposure system for extracting an input exposure pattern corresponding to a unit block exposure pattern, the input exposure pattern including a plurality of apexes, a selected apex of the input exposure pattern having first vectors connecting the selected apex to other apexes of the input exposure pattern, the unit block exposure pattern including a plurality of apexes, one of the plurality of apexes of the unit block exposure pattern being a reference point having second vectors connecting the reference point to other apexes of the unit block exposure pattern, said pattern extracting apparatus comprising:

comparator means for comparing the first vectors of the selected apex of the input exposure pattern with the second vectors of the reference point of the unit block exposure pattern;

determining means, coupled to said comparator means, for determining whether or not the first vectors coincide with the second vectors; and

extracting means, coupled to the determining means, for extracting the input exposure pattern as the unit block exposure pattern when the determining means determines that the first vectors coincide with the second vectors.

5,590,049

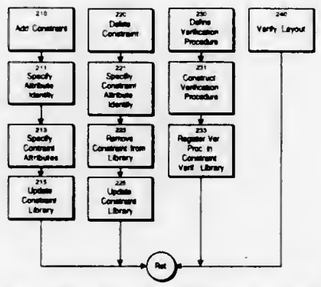
METHOD AND SYSTEM FOR USER PROGRAMMABLE DESIGN VERIFICATION FOR PRINTED CIRCUIT BOARDS AND MULTICHIP MODULES

Sandeep Arora, Boston, Mass., assignor to Cadence Design Systems, Inc., San Jose, Calif.

Filed Sep. 7, 1994, Ser. No. 302,329

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 **9 Claims**



1. In an computer aided design system for the design of an electronic circuit, a method of verifying design constraints in the electronic circuit, the electronic circuit including a selected plurality of interconnected components, the method comprising the steps of:

defining a design constraint for a component of the electronic circuit;

providing a verification engine for executing a verification procedure verifying the design constraint of the component;

providing a programming interface for defining the verification procedure verifying the design constraint;

defining the verification procedure in the programming interface, the verification procedure remaining independent of the verification engine until execution of the verification procedure; and

executing the verification procedure with the verification engine to verify the design constraint.

5,590,050

DEVICE FOR AID IN INTEGRATED CIRCUIT DESIGN THAT REDUCES THE NUMBER OF CELLS IN A CIRCUIT REPRESENTATION

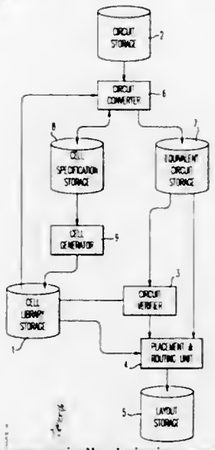
Ryosuke Okuda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1994, Ser. No. 196,365

Claims priority, application Japan, Feb. 24, 1993, 5-058086

Int. Cl.[6] H01L *21/70*

U.S. Cl. 364—490 **26 Claims**



1. A device for automatically designing a semiconductor integrated circuit, said device including a placement and routing unit for determining the arrangement of cells and lines on an integrated circuit chip on the basis of data of cells stored in a cell library storage and data of a circuit stored in a circuit storage, said device comprising:

a circuit converter for generating data of an equivalent circuit having cells smaller in total number than those of said circuit by the use of a new cell which is not stored in said cell library storage on the basis of said circuit formed by connecting only the cells stored in said cell library storage to apply said data of said equivalent circuit to said placement and routing unit, said circuit converter producing a specification of said new cell; and

a cell generator for producing data required to register said new cell in said cell library storage on the basis of said new cell specification.

5,590,051

PROCESS SIMULATION METHOD, PROCESS SIMULATOR AND CHEMICAL VAPOR DEPOSITION SYSTEM EMPLOYING THE SAME

Ayumi Yokozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,982

Claims priority, application Japan, Dec. 1, 1993, 5-301383

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—496 **7 Claims**

1. A process simulation method wherein a plurality of parameters required to determine optimum process conditions which provide the best step coverage of a dielectric film for a capacitor to be formed on a semiconductor substrate by a chemical vapor deposition method by supplying a plurality of raw material gases to the semiconductor substrate are inputted as values defining given variation ranges and the thus inputted parameters are individually varied to select optimum process conditions, comprising the steps of:

setting a plurality of process condition sets of different combinations from the plurality of inputted parameters;

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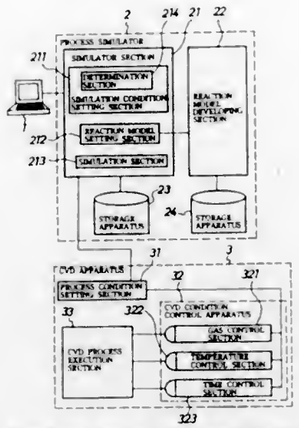


recalling, from a data base in which vapor phase reactions and film surface reactions individually corresponding to a plurality of process condition sets are stored as models obtained by a non-empirical modeling method in advance, those of the vapor phase reaction models and the film surface reaction models which correspond to the individual process condition sets determined at the setting step; and

executing simulations of vapor phase reactions and film surface reactions by the thus recalled vapor phase reaction models and film growth models and comparing results of the simulations with each other to select optimum process conditions.

5,590,052

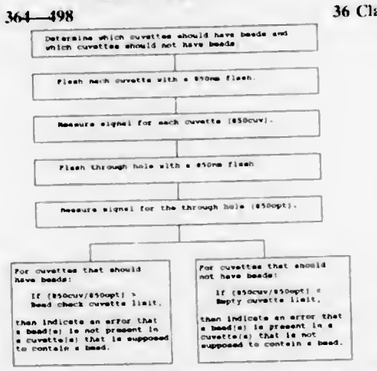
ERROR CHECKING IN BLOOD ANALYZER

Anne R. Kopf-Sill, Portola Valley; Steven N. Buhl, Cupertino; Glenda L. Choate, Belmont; Lloyd A. Schick; Robert E. Nagle, both of Mountain View; Jenq C. Chang, San Jose; Daniel Bernstein, San Mateo, and Wayne A. Britt, Sunnyvale, all of Calif., assignors to Abaxis, Inc., Sunnyvale, Calif.

Filed Apr. 14, 1994, Ser. No. 227,554

Int. Cl.[6] **G01N** *21/17*

U.S. Cl. 364—498 **36 Claims**



1. A method for confirming the presence of a reagent in sample receptacles of a receptacle holder before a fluid sample is applied to the sample receptacles, the receptacle holder being used with a fluid analyzer having alight source and a light detector disposed to detect light directed through the sample receptacles, the method comprising the steps of:

directing light through each sample receptacle, wherein at least some of the sample receptacles contain a reagent before the fluid sample is applied;

measuring a signal from the light detector for each sample receptacle while the light is directed through each sample receptacle;

directing light between the light source and the light detector through an open aperture in the sample receptacle or in the absence of the sample receptacle and measuring a reference signal;

comparing the measured signals for each sample receptacle with the reference signal to produce a comparison value for each sample receptacle;

indicating an error condition if the comparison value for any sample receptacle that should contain the reagent differs by at least a predetermine amount from a first value expected when the reagent is present; and

introducing an amount of the liquid sample to at least one of the sample receptacles if no error condition is indicated.

5,590,053

METHOD OF DETERMINING A SPACE GROUP

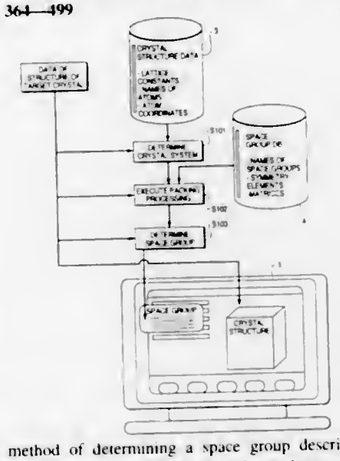
Tatsuya Ito; Masahito Kawai, and Yoshihito Yasukawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Jul. 21, 1994, Ser. No. 278,155

Claims priority, application Japan, Oct. 29, 1993, 5-271501

Int. Cl.[6] **G06F** *17/10*

U.S. Cl. 364—499 **3 Claims**



1. A method of determining a space group descriptive of a structure of a target crystal defined by input data, said method comprising the steps of:

determining a crystal system to which the structure of the target crystal belongs, said structure being stored on a first disk;

performing packing processing by use of a plurality of space groups included in said crystal system and stored on a second disk;

performing comparison between each of a plurality of crystal structures obtained by said packing processing and said structure of said target crystal, and determining, when data of one of said plurality of crystal structures obtained from a corresponding one of said plurality of space groups by said packing processing agrees with data of said structure of said target crystal, that said corresponding one of said plurality of said space groups is one descriptive of said structure of said target crystal; and

displaying results of the performing step on a display.

5,590,054

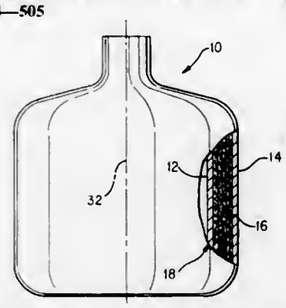
VARIABLE-DENSITY METHOD FOR MULTI-LAYER INSULATION

Glen E. McIntosh, Boulder, Colo., assignor to Cryogenic Technical Services, Inc., Boulder, Colo.

Division of Ser. No. 220,995, Apr. 1, 1994, abandoned. This application May 24, 1995, Ser. No. 449,662

Int. Cl.[6] **A47J** *41/00;* **B65D** *23/02;90/08*

U.S. Cl. 364—505 **5 Claims**



1. A method of insulating a multi-layer insulation (MLI) structure which includes a relatively cold wall, a relatively warm wall, an evacuated space therebetween, a plurality of radiation barriers located in said evacuated space and a plurality of separators located between substantially all adjacent radiation barriers, said separators having a thickness to provide a distance between said radiation barriers, said method comprising the steps of:

conducting a heat balance at selected locations between said warm and said cold walls in said evacuated space to determine the portion of the overall thermal conductivity value (k_r) that is attributable at each said selected location to radiation (k_r) and solid conduction (k_s); and

establishing the thickness of said separators at said selected locations and thusly the distance between said radiation barriers at said selected locations in accordance with the values of k_r and k_s at said selected locations, wherein said heat balance is conducted substantially in accordance with the equations:

$$k_t = k_r + k_g + k_s;$$

and,

$$k_r = \sigma \left\{ \frac{[\epsilon_w \cdot \epsilon_c]}{\epsilon_w + \epsilon_c - \epsilon_w \cdot \epsilon_c} \cdot [T_w^2 + T_c^2] \cdot (T_w + T_c) - C \cdot [(T_w + T_c)/2]^3 \right\}$$

Where,

σ=Stephan-Boltzmann constant=5.675E(−8) $W/m^2 \cdot K^4$

T_w= temperature of the warm surface, K

T_c= temperature of the cold surface, K

ϵ_w & ϵ_c are the warm and cold surface emissivities

C=a factor of the separated material and density

$$k_g = C_1 \cdot P \cdot \propto$$

Where,

k_g=gas conduction, $W/m^2 \cdot K$

P= gas pressure, Pa

$\propto$= accommodation coefficient

$C_1 = [(\gamma+1)/(\gamma-1)] \cdot [R/8\pi \cdot M \cdot T]^{1/2}$ and,

Where,

$\gamma = C_p/C_v$

R=gas constant, 8.31441 J/mol·K

M=molecular wt of gas, kg/mol

T=temperature of vacuum gauge, normally 300K;

and,

$$k_s = C_2 \cdot f \cdot K/\Delta X$$

Where,

k_s=the solid conductivity per unit thickness, $W/m^2 \cdot K$

C_2= an empirical constant

f=relative density of the separator compared to solid material

k= separator material thermal conductivity, W/m·K, and

ΔX=actual thickness of separator between reflectors, m.

5,590,055

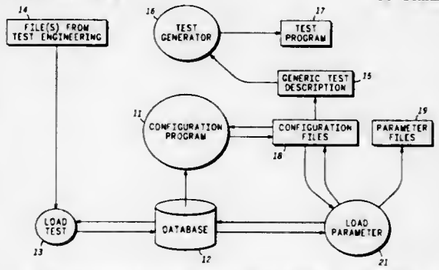
METHOD FOR DESCRIBING MEASURED RESULTS

William Chapman, Scottsdale; Gwo-Jer Chang, Mesa; Emerald Hwang, Tempe, all of Ariz.; James Holt, Del Valle, Tex.; Lee Howington, Austin, Tex., and James Chalmers, Pflugerville, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 196,539, Feb. 15, 1994, abandoned. This application Mar. 24, 1995, Ser. No. 410,649

Int. Cl.[6] **G06F** *17/30*

U.S. Cl. 364—550 **10 Claims**



1. A method for describing measured results, comprising the steps of:

defining a class of entities to be measured;

defining a set of criteria which distinguish entities within the class of entities to be measured;

dynamically configuring a computer display format based on the set of criteria;

displaying the set of criteria on a computer display according to the computer display format;

interactively specifying values related to an individual entity;

displaying a predetermined set of measurements on the computer display, the predetermined set of measurements being the set related to a valid class of entities to be measured;

associating a predetermined set of measurements with the set of criteria; and

generating a parameter label which uniquely identifies the predetermined set of measurements that is associated with the set of criteria, wherein the parameter label describes the measured result.

5,590,056

METHOD AND APPARATUS FOR COMPUTER PROGRAM USAGE MONITORING

Robert Barritz, New York, N.Y., assignor to Isogon Corporation, New York, N.Y.

Continuation of Ser. No. 180,218, Jan. 12, 1994, Pat. No. 5,499,340. This application Sep. 21, 1995, Ser. No. 531,928

Int. Cl.[6] **G06F** *11/34*

U.S. Cl. 364—550 **112 Claims**

1. Apparatus for determining program usage on a computer having at least one storage device, said apparatus comprising:

memory means having both a list of program module names of program modules and for each of said program module names a product name associated therewith stored therein;

surveying means that surveys the storage devices and stores in said memory means module names of modules stored on said at least one storage device;

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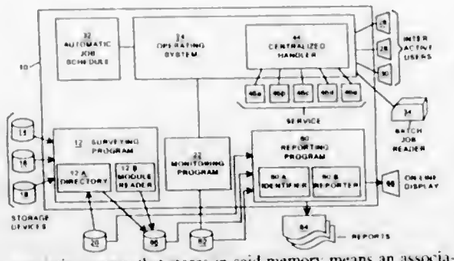


associating means that stores in said memory means an association between the product names stored in said memory means and each of said module names stored in said memory means;

monitoring means that monitors invocations of said modules on said computer and stores in said memory means invocation data relating to said invocations of said modules;

correlating means that correlates said invocation data stored in said memory means and said association between the product names and each of said module names stored in said memory means; and

reporting means that outputs the data correlated by said correlating means.

5,590,057

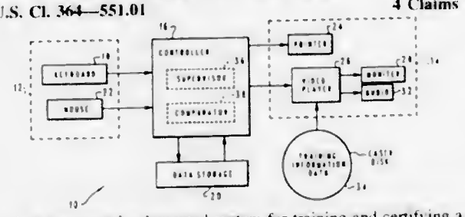
TRAINING AND CERTIFICATION SYSTEM AND METHOD

Robert L. Fletcher, Dallas, and Gregory V. Ruuska, Garland, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 20, 1993, Ser. No. 169,264

Int. Cl.[6] G06F *15/20;15/42;* **G07B** *7/00*

U.S. Cl. 364—551.01 **4 Claims**



1. A computer-implemented system for training and certifying a trainee to perform a task, the system comprising:

a data storage for storing preset limit data to determine certifiability of the trainee and for storing log data of the trainee;

a controller for receiving input data of the trainee from an input device, sending control data to an output device and sending said log data of the trainee to said data storage;

a supervisor for interpreting said input data, determining said control data to be sent by said controller to said output device and determining said input data to be stored as said log data in said data storage, said supervisor further monitoring trainee's interaction with simulations of a portion of said task to determine control data sent to said output device to review instructions and information pertaining to said portion of said task if it is determined that said trainee's interaction with simulations of said portion of said task is not acceptable or to provide a test pertaining to said portion of said task if it is determined that said trainee's interaction with simulations of said portion of said task is acceptable, such that said interaction with said simulations and said review or test pertaining to said portion of said task is thereafter repeated for other portions of said task, and is followed by a post testing of the trainee's overall knowledge of said task for comprising said log data; and

a comparator that is accessible to said data storage to compare said log data with said preset limit data to determine certifiability of the trainee.

5,590,058

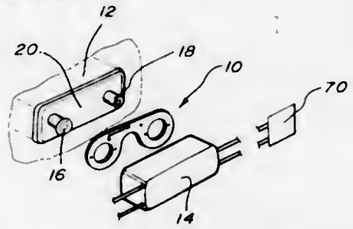
BATTERY MONITOR FOR UNOBSTRUSIVE INSTALLATION WITH A BATTERY CONNECTOR

Kevin G. Foreman, Sandia Park; Paul J. Miller, and Steven M. Siska, both of Albuquerque, all of N.M., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 998,354, Dec. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 938,111, Aug. 31, 1992, Pat. No. 5,290,191, which is a continuation-in-part of Ser. No. 895,148, Jun. 5, 1992, Pat. No. 5,181,859, which is a continuation of Ser. No. 694,262, Apr. 29, 1991, abandoned. This application Feb. 24, 1995, Ser. No. 394,924

Int. Cl.[6] G01R *15/00;19/155*

U.S. Cl. 364—551.01 **21 Claims**



1. A water-like device for sensing characteristics of a battery having a positive post and a negative post extending from a surface thereof, said device comprising:

a generally flat substrate having first and second openings therein for receiving the positive and negative posts of the battery;

sensor means carried by the substrate for detecting characteristics of the battery;

port means carried by the substrate for providing a connection to external equipment for transmitting information detected by the sensor means;

conductive means for making electrical connection between the posts and at least the sensor means; and

said device being constructed so that it is insertable over the posts of the battery such that it lies essentially parallel to the battery surface with the posts extending through the openings in the substrate and making contact with the conductive means.

5,590,059

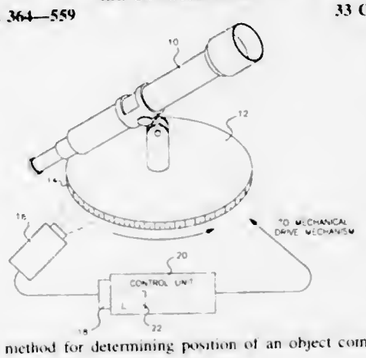
POSITION ENCODER SYSTEM WHICH UTILITES THE FUNDAMENTAL FREQUENCY OF A RULED SCALE ON AN OBJECT

J. Alan Schier, 7105 Owens St., Tujunga, Calif. 91042-1425

Filed Mar. 14, 1995, Ser. No. 403,409

Int. Cl.[6] G05B *19/18*

U.S. Cl. 364—559 **33 Claims**



1. A method for determining position of an object comprising the

obtaining a continuous representation of a continuous section of the object, the section having indicia thereon;

determining, from the continuous representation, frequency of changes on the indicia; and

determining phase between the determined frequency and a reference to obtain actual position of the object.

5,590,060

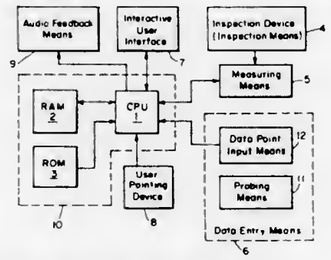
APPARATUS AND METHOD FOR AN OBJECT MEASUREMENT SYSTEM

Gregg Granville, New Boston, and J. Peter Glasson, Durham, both of N.H., assignors to Metronics, Inc., Bedford, N.H.

Continuation of Ser. No. 258,123, Jun. 10, 1994, abandoned, which is a continuation of Ser. No. 854,247, Mar. 20, 1992, abandoned. This application Nov. 15, 1995, Ser. No. 558,767

Int. Cl.[6] G06K *9/00*

U.S. Cl. 364—560 **30 Claims**



1. An object inspection system comprising:

an inspection station for holding an object to be measured;

a display monitor for viewing the object to be measured;

means for inputting at least one point location datum indicative of a point on the object;

processing means, responsive to the inputted point location data, for automatically determining if the inputted point location data represent a particular geometric feature type including a single point, two single points, a line, a circle, an arc, and an angle; and

means for displaying an indication of the geometric feature type determined to be represented by said inputted data.

5,590,061

METHOD AND APPARATUS FOR THERMAL MANAGEMENT IN A COMPUTER SYSTEM

J. Rhoads Hollowell, II, Sunnyvale; James R. Beninghaus, Cupertino, both of Calif., and Daniel J. Hansen, Jr., Georgetown, Tex., assignors to Apple Computer, Inc., Cuptertino, Calif.

Filed May 12, 1994, Ser. No. 241,962

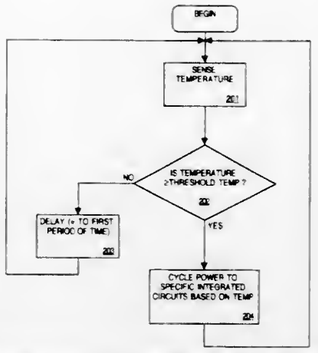
Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—571.03 **26 Claims**

1. A method for regulating the internal temperature of a computer system, said method comprising the steps of:

monitoring the internal temperature of the computer system;

placing at least one integrated circuit within the computer system into a first powered state for a first period of time and then a second powered state for a second period of time repeatedly when the internal temperature is at least at a threshold temperature, wherein the step of placing comprises the step of selecting durations of the first period of time and



the second period of time based on an amount the internal temperature exceeds the threshold temperature.

5,590,062

SIMULATOR FOR PRODUCING VARIOUS LIVING ENVIRONMENTS MAINLY FOR VISUAL PERCEPTION

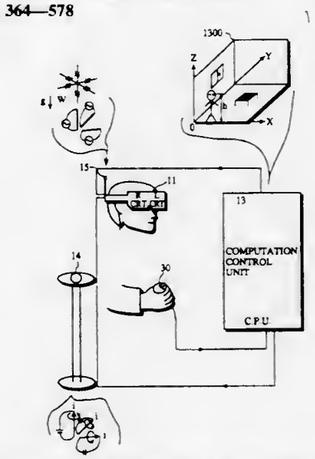
Sachio Nagamitsu, Kyoto; Hisashi Kodama, Ikoma; Mayumi Sakai, Katano; Yoshihiro Hattori, Osaka, and Tuneko Okada, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 21, 1994, Ser. No. 263,187

Claims priority, application Japan, Jul. 2, 1993, 5-164863; Jul. 8, 1993, 5-169325; Sep. 13, 1993, 5-226992; Jun. 21, 1994, 6-138502

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **58 Claims**



1. A simulator system for providing a virtual environment for a user, comprising:

viewing means to provide images of a virtual environmental for the user's eyes;

input means for inputting data to create images for the user's eyes through the viewing means including physical conditions of the virtual environment at predetermined locations in the virtual environment; and

control means to enable the user to interact with the virtual environment images including:

means for creating a variable symbol in the virtual environment, controlling movement of the symbol through the virtual environment and cause the symbol to visually change in appear-

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ance in response to the physical condition data at the predetermined locations, to thereby convey information visually to the user.

5,590,063

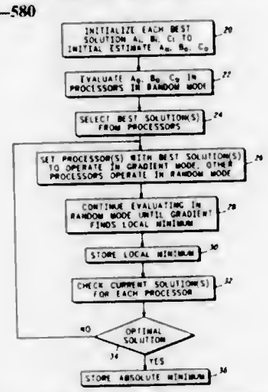
OPTIMIZATION METHOD USING PARALLEL PROCESSORS

John M. Gollo, Chandler; Robert C. Turner, Mesa; Monte G. Miller, Phoenix, and David J. Halchin, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,948

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—580 **16 Claims**



1. A computer implemented method of determining parameter values of a circuit model, comprising the steps of:

(a) initializing a plurality of processors with initial estimates of the parameter values of the circuit model;

(b) evaluating initial estimates within a plurality of processors respectively to determine a plurality of solutions;

(c) selecting a best estimate of the parameter values of the circuit model from said plurality of solutions;

(d) setting at least one of said plurality of processors having said best estimate to run in gradient mode while setting others of said plurality of processors to run in random mode; and

(e) evaluating estimates of the parameter values of the circuit model from said plurality of processors running in random mode until said at least one of said plurality of processors running in gradient mode determines a local minimum.

5,590,064

POST-FILTERING FOR DECODED VIDEO SIGNALS

Brian Astle, Princeton, N.J., assignor to Intel Corporatinn, Santa Clara, Calif.

Filed Oct. 26, 1994, Ser. No. 329,548

Int. Cl.[6] G06F *7/00;15/00;* **G06K** *9/40;* **H04N** *11/02*

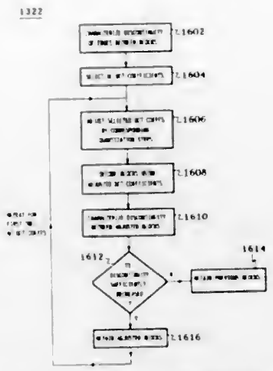
U.S. Cl. 364—715.02 **30 Claims**

1. A computer-implemented process for transforming encoded video signals into decoded video frames, comprising the steps of:

(a) providing encoded video signals corresponding to a video frame, wherein the encoded video signals comprise a first set of transform coefficients corresponding to a first region of the video frame and a second set of transform coefficients corresponding to a second region of the video frame;

(b) applying an inverse transform to the first set of transform coefficients to generate a decoded first region of a decoded video frame;

(c) applying the inverse transform to the second set of transform coefficients to generate a decoded second region of the decoded video frame;



(d) generating an original discontinuity measure for a boundary between the decoded first region and the decoded second region;

(e) adjusting at least one transform coefficient of the second set of transform coefficients in accordance with the original discontinuity measure to generate an adjusted second set of transform coefficients for the second region; and

(f) generating a filtered second region of a filtered video frame in accordance with the adjusted second set of transform coefficients.

5,590,065

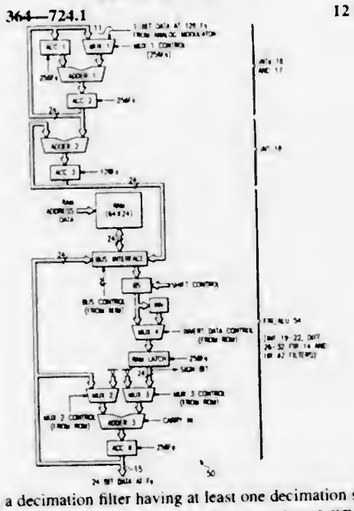
DIGITAL DECIMATION FILTER FOR DELTA SIGMA ANALOG-TO-DIGITAL CONVERSION WITH REDUCED HARDWARE COMPELEXITY

Kun Lin, Austin, Tex., assignor to Crystal Semiconductor Corporation, Ausitn, Tex.

Filed Aug. 10, 1994, Ser. No. 288,624

Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—724.1 **12 Claims**



1. In a decimation filter having at least one decimation stage and a plurality of integrator stages and a like plurality of differentiator stages in which at least one of the integration or differentiation stages has its own adder and accumulator hardware, the improvement comprising implementing at least one of the integration

stages, said at least one decimation stage, and at least one of the differentiation stages together with a FIR filter in shared hardware which has a single adder.

5,590,066

TWO-DIMENSIONAL DISCRETE COSINE TRANSFORMATION SYSTEM, TWO-DIMENSIONAL INVERSE DISCRETE COSINE TRANSFORMATION SYSTEM, AND DIGITAL SIGNAL PROCESSING APPARATUS USING SAME

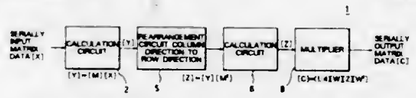
Mitsuharu Ohki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,342

Claims priority, application Japan, Sep. 24, 1993, 5-238526

Int. Cl.[6] G06F *17/14*

U.S. Cl. 364—725 **8 Claims**



1. A two-dimensional DCT system which acts as a matrix data multiplication apparatus which multiplies with an input matrix

from the left side, a first coefficient matrix able to dissolve a matrix into a first matrix of at least one diagonal component of irrational numbers and other components of all "0" and a second matrix of components of irrational numbers, "+1", or "−1" and

from the right side, a second coefficient matrix of a transpose matrix of said first coefficient matrix able to dissolve a matrix into a third matrix of a transpose matrix of said second matrix and a fourth matrix of a transpose matrix of said first matrix and outputs the results of the multiplication operations, that is, the components of the output matrix,

said DCT system comprising:

a first calculation circuit for performing a predetermined calculation corresponding to a multiplication operation on said second matrix and said input matrix;

a second calculation circuit for performing a predetermined calculation corresponding to a multiplication operation on the result of the multiplication operation of said first calculation circuit and said third matrix; and

a multiplier which performs a predetermined calculation corresponding to calculation for multiplying with the result of multiplication of said second calculation circuit said first matrix from said left side and said fourth matrix from said right side,

each of said first calculation circuit and said second calculation circuit having

a plurality of stages of memory elements connected in series and arranged in a pipeline system and

one or more arithmetic operation units for performing predetermined calculations using the data supplied from said memory elements and outputting the results of said calculations to predetermined memory elements, and

each of said first calculation circuit and said second calculation circuit serially receiving as input the data from a first stage of memory elements, successively transferring said input data to a later stage of memory elements by said pipeline system, performing calculations by said one or more arithmetic operation units in a transfer process, and serially outputting said data showing said results of said calculations from the final stage of said memory elements.

5,590,067

METHOD AND ARRANGEMENT FOR TRANSFORMATION OF SIGNALS FROM A FREQUENCY TO A TIME DOMAIN

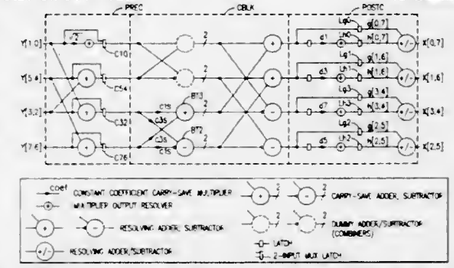
Anthony M. Jones; Kevin D. Dewar, both of Bristol, and Martin W. Sotheran, Dursley, all of Great Britain, assignors to Discovision Associates, Irvine, Calif.

Division of Ser. No. 82,087, Jun. 24, 1993, Pat. No. 5,479,364. This application Mar. 14, 1995, Ser. No. 404,067

Claims priority, application European Pat. Off., Jun. 26, 1992, 92305927

Int. Cl.[6] G06F *7/38*

U.S. Cl. 364—725 **48 Claims**



1. A system for use in transforming digital signals from a frequency to a time representation, in which the digital signals are arranged in groups of N data input words, comprising:

common processing means (CBLK) having a plurality of common arithmetic devices (BT2, BT3, cls, c3s) arranged to pass both odd- and even-numbered input data words in separate passes to form odd and even common processing means output values, respectively;

pre-common processing means (PREC) arranged to perform predetermined pairing operations on odd-numbered ones of the input words and to transmit even-numbered ones of the input words to pre-common outputs; and

post-common processing means (POSTC) arranged to perform predetermined output scaling operations on the odd common processing means output values to form post-processed odd values and to arithmetically combine the post-processed odd values with the even common processing means output values to generate high- and low-order output words, the system being arranged such that the output words contain inverse discrete cosine transformation values corresponding to the input data words.

5,590,068

ULTRA-HIGH DENSITY ALTERNATE METAL VIRTUAL GROUND ROM

Albert Bergemont, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 274,675, Jul. 13, 1994, abandoned, which is a continuation of Ser. No. 11,955, Feb. 1, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,257

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—63 **5 Claims**

1. An alternate metal virtual ground (AMG) read only memory (ROM) array formed in a silicon substrate of P-type conductivity, wherein the array includes a ROM cell matrix that is divided into a plurality of segments, each segment defined by a plurality of rows and a plurality of columns of ROM data storage cells, the array comprising:

a plurality of parallel, spaced-apart buried N+ bit lines formed in the silicon substrate;

P-type dopant introduced into those portions of the silicon substrate that are programmed channels of programmed ROM data storage cells in the array;

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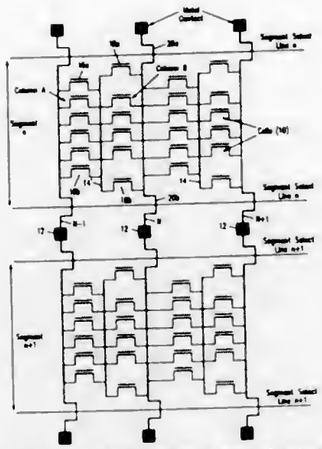


the following spaced-apart, parallel strips of polysilicon and underlying gate oxide formed on the silicon substrate, all of which run perpendicular to the N+ buried bit lines;

(i) one segment select line strip formed at the top and one segment select line strip formed at the bottom of each segment to provide gate electrodes of segment select switching transistors;

(ii) one outer select line strip formed at the top and one outer select line strip formed at the bottom of each segment to provide gate electrodes of outer select transistors;

(iii) one inner select line strip formed at the top and one inner select line strip formed at the bottom of each segment to provide gate electrodes of inner select transistors; and

(iv) one word line strip for each row of ROM data storage cells in a segment to provide gate electrodes for the ROM data storage cells

such that the outer select line strips, the inner select line strips and the word line strips overly the N+ buried bit lines and are separated therefrom by gate oxide and such that the segment select line strips overly p-type silicon substrate and are separated therefrom by gate oxide;

N-type dopant introduced into the silicon substrate to define N+ source and N+ drain regions of the segment select transistors and to connect the segment select transistors to corresponding N+ buried bit lines; and

a plurality of conductive contact lines formed such that each alternating N+ buried bit line is contacted by a corresponding conductive contact line at first and second contact locations in each segment to thereby define contacted drain bit lines of the array, each non-contacted N+ buried bit line being segmented into a length sufficient to form a segmented source bit line for a preselected plurality of ROM data storage cells, thereby defining a column of ROM data storage cells in the array segment;

such that, for each contacted drain bit line, one of a pair of segment select switching transistors is connected between the contacted drain bit line and one of the two contact locations of that contacted drain bit line, and

such that, for each segmented source bit line, one of a pair of inner select switching transistors is connected between one of the ends of the segmented source bit line and a first adjacent contacted drain bit line associated with the segmented source bit line, and

such that, for each segmented source bit line, one of a pair of outer select switching transistors is connected between one of the ends of the segmented source bit line and a second adjacent contacted drain bit line associated with the segmented source bit line.

5,590,069

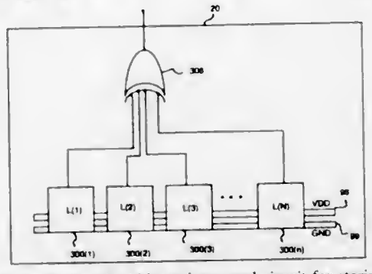
METHOD AND APPARATUS FOR PROVIDING ROM IN AN INTEGRATED CIRCUIT HAVING UPDATE THROUGH SINGLE SUBSTANCE LAYER MODIFICATION CAPABILITY

Jeffrey A. Levin, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Filed Oct. 17, 1994, Ser. No. 324,433

Int. Cl.[6] G11C *17/00*

U.S. Cl. 365—96 **23 Claims**



23. A circuit placed within an integrated circuit for storing data within the integrated circuit comprising:

a plurality of circuits that can be permanently placed in a first state or second state via modification of a single substance layer that is difference for each circuit;

means for generating first signal in said first logic state when a first circuit in said plurality of circuits is in said first state and in second logic state when said first circuit is in second state;

means for generating an alternative first signal in said second logic state when said first signal from said plurality of circuits is in said first state, and in said first logic state when said first circuit is in said second state; and

means for generating a second signal that is logically equivalent to said first signal when a second circuit from said plurality of circuits is in said first state, and which is logically equivalent to said alternative first signal when said second circuit is in said second state.

5,590,070

DYNAMIC MEMORY

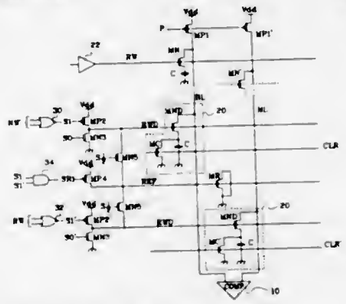
Michel Harrand, Saint Egreve, and Michel Runtz, Grenoble, both of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Division of Ser. No. 240,144, May 10, 1994. This application Jun. 6, 1995, Ser. No. 465,810

Claims priority, application France, May 24, 1993, 93 06533

Int. Cl.[6] G11C *11/24*

U.S. Cl. 365—149 **20 Claims**



1. A dynamic memory device, comprising:

memory means for storing a memory voltage having one of a first value and a second value, the memory means having a first capacitance;

reference means for storing a reference voltage, the reference means having a second capacitance substantially equal to the first capacitance of the memory means, the reference voltage being determined by the second capacitance;

comparing means for comparing the memory voltage with the reference voltage, the comparing means including first input means for receiving voltage, second input means for receiving voltage, and output means for outputting voltage, wherein the memory means and the reference means are coupled to the first input means and the second input means, respectively, and the output means outputs an output voltage according to the memory voltage and the reference voltage;

first connecting means interconnected between the memory means and the first input means;

second connecting means interconnected between the reference means and the second input means, wherein the first connecting means has a third capacitance, and the second connecting means has a fourth capacitance substantially equal to the third capacitance of the first connecting means, wherein the reference means is constructed and arranged to provide a first reference voltage, and wherein the second connecting means is constructed and arranged to provide a second reference voltage; and

means for enabling the second connecting means such that the first reference voltage is increased to a third reference voltage when the second connecting means is enabled.

5,590,071

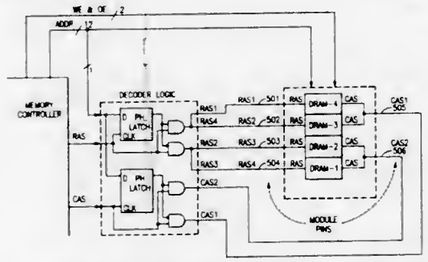
METHOD AND APPARATUS FOR EMULATING A HIGH CAPACITY DRAM

Daniel J. Kolor, Wappingers Falls; Nitin B. Gupte, and Siddharth R. Shah, both of Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1995, Ser. No. 559,321

Int. Cl.[6] G11C *11/24*

U.S. Cl. 365—149 **32 Claims**



1. An apparatus for emulating a first DRAM component having a first storage capacity, said first DRAM component being accessed by receiving an address signal from a controller, together with DRAM control signals, said address signal including a first number of address bits, said apparatus comprising:

an integrated circuit component including a plurality of second DRAMs, each of said plurality of second DRAMs having a second storage capacity, lower than the first storage capacity, wherein the cumulative total of said second storage capacities for said plurality of second DRAMs is at least equal to said first storage capacity, and wherein each of said plurality of second DRAMs may be accessed by receiving a second number of address bits from said address signal from said controller together with said DRAM control signals, said second number of address bits being less than said first number of address bits, each of said plurality of second DRAMs including a plurality of inputs for receiving said second number of address bits from said address signal and for receiving said DRAM control signals; and

a decoder having at least one first input for receiving a number of decode bits from said address signal, said number of decode bits being equal to the difference between the first number of address bits and the second number of address bits, said decoder further having at least one second input for receiving at least one of said DRAM control signals, said decoder decoding said number of decode bits to direct the output of said at least one DRAM control signal, and selecting one of said plurality of second DRAMs by providing at least one directed DRAM control signal to at least one of said plurality of second DRAMs to permit access to one of said plurality of second DRAMs, each of said plurality of second DRAMs further having at least one input for receiving said at least one directed DRAM control signal.

5,590,072

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

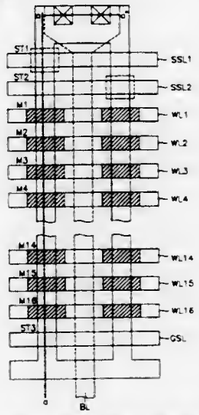
Jeong-Hyuk Choi, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 4, 1995, Ser. No. 434,803

Claims priority, application Rep. of Korea, May 7, 1994, 9986/1994

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—185.01 **5 Claims**



1. A connecting device within an electrically erasable and programmable read only memory device having a NAND cell string and first select means, said NAND cell string including a plurality of memory transistors, each of said memory transistors having a floating gate separated by a tunnel oxide layer from a channel region formed on a semiconductor substrate, and each of said memory transistors having a control gate separated by an interlayer insulation layer from said floating gate, respective channels of said memory transistors being serially connected to each other by source-drain regions, said control gate of each of said memory transistors being respectively connected to a corresponding word line, said first select means connected to one terminal of said NAND cell string, said device comprising:

a resistor connected between said first select means and a bit line, said resistor having a preset resistance value; and

an amplifying device connected between said first select means and said bit line which amplifies a reading current flowing through said NAND cell string and which supplies the amplified current to said bit line.

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5,590,073

RANDOM ACCESS MEMORY HAVING FLASH MEMORY

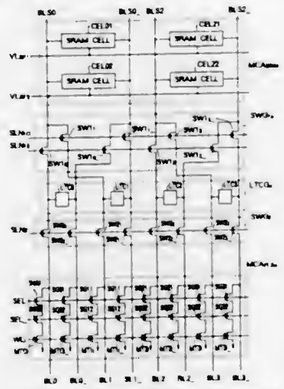
Hideki Arakawa, and Takashi Narikiyo, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Nov. 21, 1994, Ser. No. 345,695

Claims priority, application Japan, Nov. 30, 1993, 5-300678

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.08 **24 Claims**



1. A semiconductor nonvolatile memory device comprising:

a first bit line;

a second bit line;

a buffer memory connected to said first and second bit lines;

an electrically erasable programmable nonvolatile memory connected to said first and second bit lines;

a writing latch circuit to which said first and second bit lines are connected in parallel and having a differential sensor type sense amplifier;

a switching circuit for switching said nonvolatile memory and said writing latch circuit to a nonconnected state when said buffer memory is in operation, and switching said buffer memory and said writing latch circuit to a nonconnected state when said nonvolatile memory is in a writing or erasure operation;

wherein said nonvolatile memory comprises:

a first memory cell connected to a word line and said first bit line,

a second memory cell connected to a word line common with said first memory cell and connected to said second bit line, and

a means for holding the potential of either of said first and second bit lines at a first potential at a predetermined operation time and for setting the potential of the other bit line of said first and second bit lines to a second potential given a difference with the first potential for a predetermined time.

5,590,074

NONVOLATILE SEMICONDUCTOR MEMORY

Takao Akaogi; Masanobu Yoshida, both of Kawasaki; Yasushige Ogawa, Kasugai; Yasushi Kasa, and Shouichi Kawamura, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

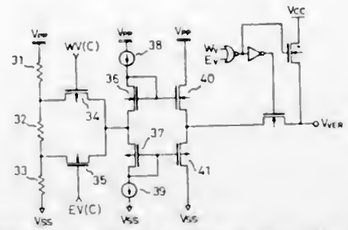
Division of Ser. No. 996,942, Dec. 28, 1992, Pat. No. 5,490,107. This application Jun. 6, 1995, Ser. No. 466,732

Claims priority, application Japan, Dec. 27, 1991, 3-346663; May 28, 1992, 4-137080; Jul. 20, 1992, 4-191793; Sep. 17, 1992, 4-248023; Oct. 9, 1992, 4-271869; Oct. 13, 1992, 4-274355; Dec. 3, 1992, 4-324302; Dec. 4, 1992, 4-325544

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.22 **7 Claims**

1. A nonvolatile writable and erasable semiconductor memory having a matrix (1) of nonvolatile writable and erasable memory



cell transistors (Mij) formed at intersections of word lines (WL1 to WLm) and bit lines (BL11 to BL1k, . . . , BLn1 to BLnk), a row decoder (3), a column decoder (5), and sense amplifiers (71 to 7n) connected to the bit lines (BL11 to BL1k, . . . , BLn1 to BLnk), respectively, the nonvolatile writable and erasable semiconductor memory comprising:

write means connected to said matrix;

verify means having at least one function selected from a) a write verify function which determines whether or not data are written in a memory as to accurately read out said data even when variation in a power source voltage occurs during a reading operation, and b) an erase verify function which determines whether or not data are erased in said memory as to accurately read out said data even when variation in the power source voltage occurs in the reading operation;

the verify means including means for detecting an output voltage of the sense amplifiers, comparison means for comparing the output voltage with a reference voltage, and storage means for storing a result of the comparison; and

means for repeating a write operation and/or erase operation to memory cell transistors, if a result of comparison provided by the storage means after a verify operation for the write operation and/or erase operation indicates that the write operation and/or erase operation is not successful.

5,590,075

METHOD FOR TESTING AN ELECTRICALLY ERASABLE AND PROGRAMMABLE MEMORY DEVICE

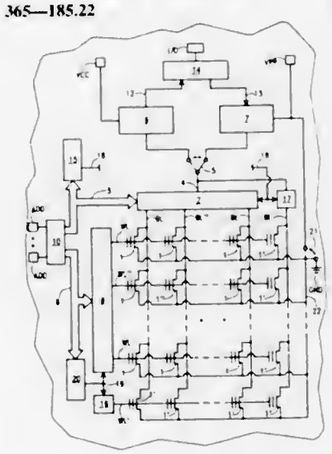
Stefano Mazzali, Carnate, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jun. 7, 1995, Ser. No. 479,081

Claims priority, application European Pat. Off., Jun. 7, 1994, 94830276

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.22 **12 Claims**



1. A method for in-factory testing of a flash EEPROM device comprising a matrix of memory cells and redundancy memory cells for functionally substituting defective memory cells, characterized by comprising the following steps:

a) programming all the memory cells of the memory device;

b) submitting all the memory cells of the memory device to a preliminary electrical erasure for a time much shorter than an average erasing time of the memory cells;

c) reading the information stored in all the memory cells of the memory device;

d) memorizing the addresses of defective memory cells which at step c) have been read as erased memory cell; and

e) storing the addresses of the defective memory cells in redundancy registers of the memory device, associated to redundancy memory cells which must substitute the defective memory cells.

5,590,076

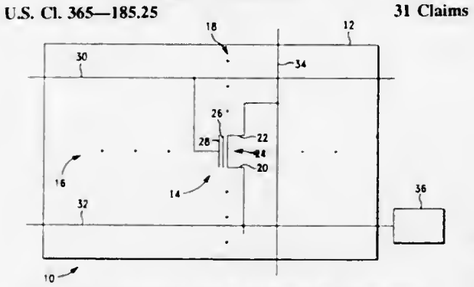
CHANNEL HOT-CARRIER PAGE WRITE

Sameer S. Haddad, San Jose; Chi Chang, Redwood City, and David K. Y. Liu, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 21, 1995, Ser. No. 493,138

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.25 **31 Claims**



1. A low-energy write mode flash EEPROM, comprising:

an array of floating gate flash EEPROM memory cells formed on a substrate in rows and columns, each cell having a source, a drain, a channel between the source and the drain, a floating gate extending between the source and the drain above the channel, and a control gate extending between the source and the drain above the floating gate, the control gates of respective rows being connected to respective word select lines, the memory cell sources for at least one row of memory cells being coupled to a common source line, and the memory cell drains of respective columns being connected to respective bit select lines;

the memory cells having a high core doping to optimize cell programming by hot carrier injection into the floating gates of selected memory cells;

a circuit for limiting a programming drain current to less than 10 μA per memory cell, the limited cell drain current resulting in a high programming efficiency; and

a selected row of memory cells being programmable within a shortened row programming interval having a predetermined value less than 100 μS,

whereby the limited drain current and the shortened row programming interval define a low-energy write mode of operation for the flash EEPROM.

5,590,077

SEMICONDUCTOR MEMORY DEVICE

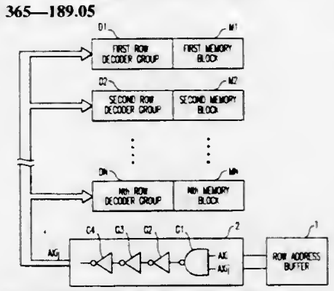
Dong M. Lee, Kyungki-Do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Feb. 3, 1995, Ser. No. 383,003

Claims priority, application Rep. of Korea, Feb. 7, 1994, 94-2245

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—189.05 **3 Claims**



1. A semiconductor memory device comprising:

a row address buffer,

a row predecoder connected to said row address buffer,

a plurality of row decoder groups and a plurality of memory blocks connected to said row decoder groups, respectively, and

a plurality of repeaters connected between said row predecoder and said row decoder groups in a way such that any one of said row decoder groups is selected by an output signal of said row predecoder and each block select address signal which is inputted to said repeaters, respectively.

5,590,078

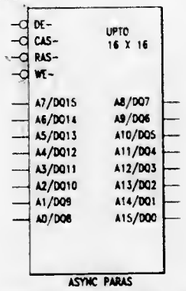
METHOD OF AND APPARATUS FOR IMPROVED DYNAMIC RANDOM ACCESS MEMORY (DRAM) PROVIDING INCREASED DATA BANDWIDTH AND ADDRESSING RANGE FOR CURRENT DRAM DEVICES AND/OR EQUIVALENT BANDWIDTH AND ADDRESSING RANGE FOR SMALLER DRAM DEVICES

Mukesh Chatter, 53 Godfrey La., Milford, Mass. 01757

Filed Oct. 7, 1994, Ser. No. 320,058

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.01 **17 Claims**



1. A method of improving the data bandwidth and addressing range capabilities of a dynamic random access memory device of the type conventionally having row and column address, data input, data output, and enable pins, and operating with addressing, data write and read cycle control lines connected with corresponding of said pins, the method comprising, on each of write and read cycles, respectively initially addressing row address on a predetermined set of the pins; then addressing on each of the write and read

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cycles, column address along the row on the same predetermined set of pins; then, on each of said write and read cycles, and following their respective column addressing, applying and retrieving data on the same predetermined set of pins during the respective write and read cycles, thereby reducing the number of pins required for addressing, writing and reading, and thus increasing data bandwidth and addressing range capabilities of the device.

5,590,079

WAFER BURN-IN TEST CIRCUIT OF A SEMICONDUCTOR MEMORY DEVICE

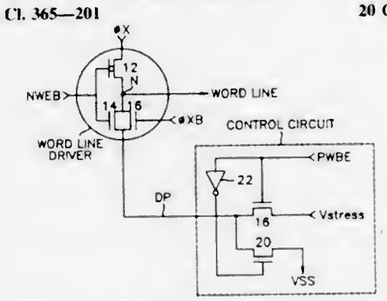
Jae-Hyeong Lee, Seoul, and Yong-sik Seok, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 7, 1995, Ser. No. 474,158

Claims priority, application Rep. of Korea, Jun. 8, 1994, 12847/1994

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—201 **20 Claims**



1. A burn-in test circuit for sensing a defective cell of a semiconductor memory device having a plurality of memory cells connected to a word line and a row decoder for selecting the word line, said burn-in test circuit comprising:

a word line driver circuit having an input coupled to receive a row decoding signal generated by the row decoder, and an output node coupled to the word line, said row decoding signal having a first state during a normal mode of operation and a second state different than said first state during a burn-in test mode of operation, said word line driver circuit including:

a word line boosting voltage transferring circuit coupled to receive an enable voltage and to said output node and being controlled by said row decoding signal, said word line boosting voltage transferring circuit being responsive to said row decoding signal in said normal mode of operation to raise said word line to a voltage level of said enable voltage,

and a current pass circuit coupled between said output node and a discharge node and being controlled by said row decoding signal, said current pass circuit being responsive to said row decoding signal in said burn-in test mode of operation to connect said word line to said discharge node;

a control circuit having a first input coupled to receive a burn-in voltage, and a second input coupled to receive a control signal; and

an electrical line connected between said discharge node of said word line driver circuit and said control circuit said control circuit being responsive to said control signal in said burn-in test mode of operation to apply said burn-in voltage to the word line via said electrical line and said current pass circuit of said word line driver circuit.

5,590,080

DYNAMIC RANDOM ACCESS MEMORY WITH VARIABLE SENSE-AMPLIFIER DRIVE CAPACITY

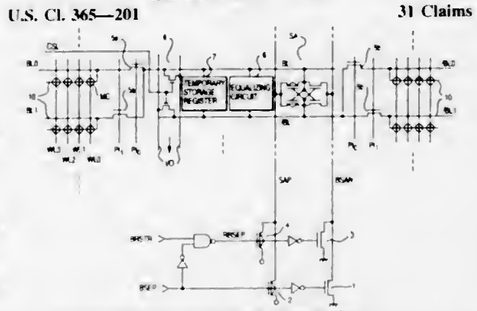
Takehiro Hasagawa, and Yukihito Oowaki, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Sep. 12, 1995, Ser. No. 527,264

Claims priority, application Japan, Sep. 17, 1994, 6-248435

Int. Cl.[6] G11C *7/00;8/00*

U.S. Cl. 365—201 **31 Claims**



1. A semiconductor memory device comprising:

a memory cell array comprising a plurality of memory-cell units arranged in a matrix, each memory-cell unit comprising a plurality of connected memory cells;

a plurality of sense-amplifier circuits, each corresponding to at least one memory-cell unit, for comparing and amplifying a potential difference of data lines of respective corresponding memory-cell units;

a plurality of sense-amplifier drivers for charging or discharging the data lines; and

means for changing drive capacity of the plurality of sense-amplifier circuit drivers during reading-out, restoring, and writing.

5,590,081

SEMICONDUCTOR MEMORY DEVICE

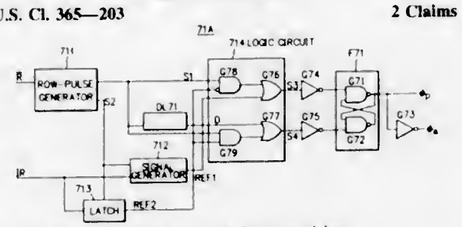
Tamio Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 546,982

Claims priority, application Japan, Oct. 24, 1994, 6-257813

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—203 **2 Claims**



1. A semiconductor memory device comprising:

a memory cell array in which memory cells to store information therein are arranged along rows and columns and in which an input/output operation of the information is conducted by specifying a row address and a column address;

a sense amplifiers for keeping therein information of one-row memory cells of a row corresponding to a beforehand specified row address, the information being kept as cache data; and

precharge control means;

the memory device achieving, when an external row address externally specified matches the selection row address, a read or write operation of the cache data in the sense amplifier and accomplishing a periodic refresh operation;

the precharge control means completing, during a period of the refresh operation cycle, a predetermined precharge operation for the sense amplifier and bit lines corresponding thereto for the subsequent memory access.

5,590,082

CIRCUIT AND METHOD FOR RETAINING DRAM CONTENT

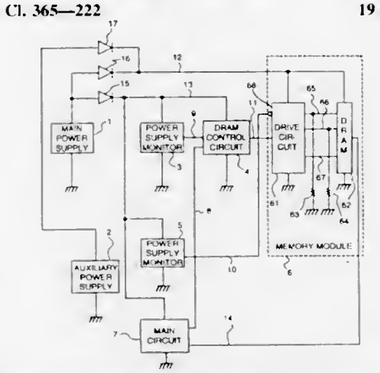
Seiichi Abe, Odawara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 467,277

Claims priority, application Japan, Jun. 7, 1994, 6-125377

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—222 **19 Claims**



1. A memory control circuit comprising a DRAM, a drive circuit for driving said DRAM, a DRAM control circuit for controlling operation of said DRAM through said drive circuit, a power supply connected to said DRAM, said DRAM control circuit and said drive circuit, a first detection circuit for generating a first detection signal that is output to said DRAM control circuit when the power supply voltage is lowered to a first predetermined voltage, and a second detection circuit for generating a second detection signal that is output to said drive circuit when the power supply voltage is lowered to a second predetermined voltage lower than said first predetermined voltage, wherein said DRAM control circuit, when said first detection signal is received, starts self-refreshing and, when said second detection signal is received, said drive circuit establishes a self-refresh mode for said DRAM.

5,590,083

PROCESS OF WRITING DATA FROM A DATA PROCESSOR TO A MEMORY DEVICE REGISTER THAT IS SEPARATE FROM THE ARRAY

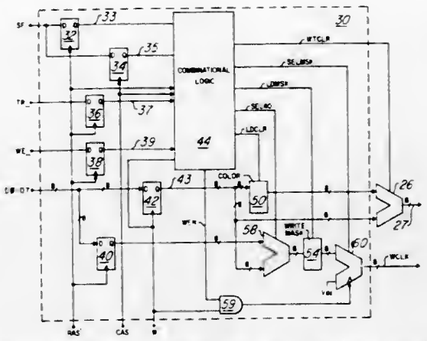
Raymond Pinkham, Missouri City, and Anthony M. Balistreri, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 734,028, Jul. 22, 1991, Pat. No. 5,195,056, which is a continuation of Ser. No. 388,783, Aug. 2, 1989, abandoned, which is a continuation of Ser. No. 81,926, Aug. 5, 1987, Pat. No. 4,961,171, which is a continuation-in-part of Ser. No. 53,200, May 21, 1987, Pat. No. 4,817,058. This application Jan. 15, 1993, Ser. No. 4,818

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—230.01 **19 Claims**

1. A system for writing data to a random access memory array device, said memory array including a plurality of memory cells



arranged in rows and columns, said device having a register separate from said array containing data to be written to said array and having a data port receiving data to be written to said array, comprising:

processor unit circuits for producing a special function signal of one and another value and a column address signal to said device; and

special function circuits in said device and responsive to said special function signal and said column address signal, said special function circuits for writing the contents of said register to said array responsive to said processor unit circuits producing said one state of said special function signal to said device and while producing said column address signal to said device, and said special function circuits for writing the data received at said data port to said array responsive to said processor unit circuits producing said another state of said special function signal to said device and while producing said column address signal to said device.

5,590,084

SEMICONDUCTOR MEMORY DEVICE HAVING A COLUMN SELECTOR

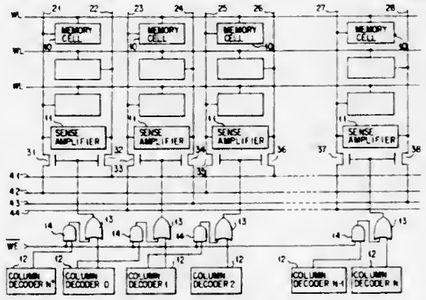
Shinji Miyano; Katsuhiko Sato, both of Yokohama, and Tomoaki Yabe, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 11, 1995, Ser. No. 419,688

Claims priority, application Japan, Apr. 13, 1994, 6-074549

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—230.01 **30 Claims**



1. A semiconductor memory device comprising:

a memory cell array in which a plurality of memory cells are arranged in a matrix, the memory cell array including a plurality of groups of columns;

a plurality of column gates respectively connected to the plurality of columns of the memory cell array;

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a plurality of data lines provided for the plurality of groups of columns and connected in common to first ends of column gates of a corresponding group of columns;

a column decoder row including column decoders, of the number greater than the number of column addresses of the memory cell array, for decoding a column address signal which designates a column of the memory cell array; and

a plurality of logical circuits, provided for columns of different column addresses in the memory cell array, for controlling the column gates of the respective columns by means of a logical OR between outputs from a predetermined plurality of column decoders for decoding different column addresses of the column decoder row.

5,590,085

COLUMN REDUNDANCY DEVICE FOR SEMICONDUCTOR MEMORY

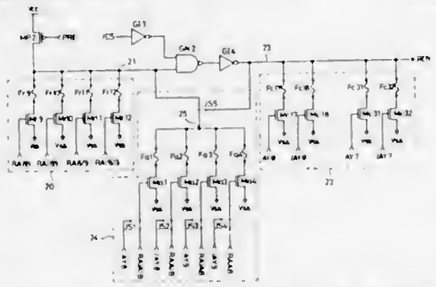
Jong H. Yuh, and Jong G. Nam, both of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Jun. 7, 1995, Ser. No. 475,863

Claims priority, application Rep. of Korea, Jun. 8, 1994, 94-12824

Int. Cl.[6] G11C *7/00;8/00*

U.S. Cl. 365—230.03 **3 Claims**



1. In a semiconductor memory having at least two memory blocks, each of said at least two memory blocks including a plurality of cell array blocks and a redundancy cell array, and input/output means for performing bidirectional data transmission with said at least two memory blocks, a column redundancy device comprising:

address input means for inputting a first row address signal used to select said cell array blocks regardless of a refresh speed of said semiconductor memory, a second row address signal selectively used to select said cell array blocks according to the refresh speed of said semiconductor memory, a first column address signal used to select one of said at least two memory blocks to be connected to said input/output means, and a second column address signal used to select bit lines included in said cell array blocks;

block programming means for determining in response to said first row address signal whether a desired number of said plurality of cell array blocks are selected;

auxiliary block programming means for determining in response to one of said second row address signal and said first column address signal and an output signal from said block programming means whether any one of said desired number of cell array blocks is selected; and

column programming means for determining in response to said second column address signal and an output signal from said auxiliary block programming means whether any one of said bit lines in said cell array block selected by said one of said second row address signal and said first column address signal and said first row address signal is addressed and selectively driving any one of memory cells included in said redundancy cell array in accordance with the determined result.

5,590,086

SEMICONDUCTOR MEMORY HAVING A PLURALITY OF I/O BUSES

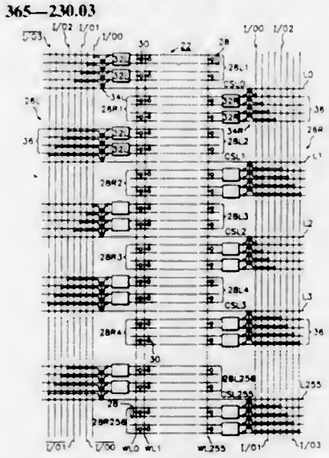
Churoo Park, Suwon; Hyun-Soon Jang, Seoul; Chull-Soo Kim, Suwon; Myung-Ho Kim, Suwon; Seung-Hun Lee, Suwon; Si-Yeol Lee, Yongin-gun; Ho-Cheol Lee; Tae-Jin Kim, both of Seoul, and Yun-Ho Choi, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 130,138, Oct. 4, 1993. This application Dec. 29, 1995, Ser. No. 580,481

Claims priority, application Rep. of Korea, Oct. 2, 1992, 18130; Oct. 2, 1992, 18131; Apr. 27, 1993, 7127

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.03 **1 Claim**



1. A semiconductor memory comprising:

a memory cell array having a plurality of memory cells arranged in rows and columns;

a plurality of sub-arrays provided by partitioning the memory cell array in a row direction, each of the sub-arrays having a plurality of word lines respectively connected to associated columns of the memory cells and a plurality of bit lines respectively connected to associated rows of the memory cells, the bit lines of each sub-array divided into first groups of bit lines and second groups of bit lines, the respective ones of which are divided into first sub-groups of bit lines and second sub-groups of bit lines, the first groups of each sub-array alternately arranged with the second groups thereof, the first sub-groups of each sub-array alternately arranged with the second sub-groups thereof; and

I/O buses respectively disposed in parallel to the word lines between the sub-arrays and on outer sides of the sub-arrays, and divided into first I/O buses and second I/O buses respectively arranged at odd and even positions, each I/O bus divided into first I/O lines and second I/O lines, the first and the second I/O lines of the respective first I/O buses respectively connected via column selection switches with the bit lines of the first and the second sub-groups of the first groups of sub-arrays adjacent thereto, the first and the second I/O lines of the respective second I/O buses respectively connected via column selection switches with the bit lines of the first and the second sub-groups of the second groups of sub-arrays adjacent thereto.

5,590,087

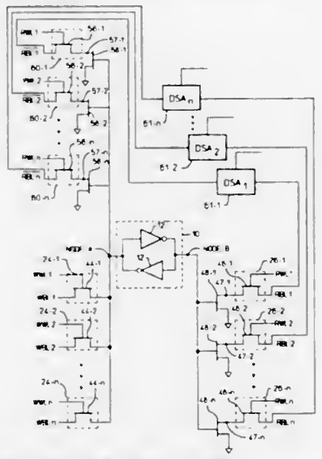
MULTI-PORTED DATA STORAGE DEVICE WITH IMPROVED CELL STABILITY

Shine Chung, and Paul G. Emerson, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 317,986, Oct. 4, 1994, abandoned, which is a continuation of Ser. No. 58,118, May 5, 1993, abandoned. This application Sep. 25, 1995, Ser. No. 533,133

Int. Cl.[6] G11C *11/34;7/00;8/00*

U.S. Cl. 365—230.05 **7 Claims**



1. A multi-ported register file, comprising:

a plurality of memory cells, each of said memory cells having first and second nodes;

a first plurality of write-side switching devices associated with each of said memory cells, each of said first plurality of write-side switching devices, when activated, connecting a different write bit line to the first node of said memory cell associated therewith;

a second plurality of write-side switching devices associated with each of said memory cells, each of said second plurality of write-side switching devices, when activated, connecting a different write-side read bit line to the first node of said memory cell associated therewith;

a plurality of read-side switching devices associated with each of said memory cells, each of said read-side switching devices, when activated, respectively connecting a different read-side read bit line to one of a plurality of read-side intermediate nodes;

a plurality of unidirectional read-side isolation devices, each of said unidirectional read-side isolation devices operatively connecting the second node of one of said memory cells to one of said read-side intermediate nodes, and each of said unidirectional read-side isolation devices comprising a field-effect transistor having a gate terminal connected to the second node of one of said memory cells, a source terminal connected to a fixed voltage source and a drain terminal connected to said one of said read-side intermediate nodes, whereby each of said unidirectional read-side isolation devices substantially prevents one-of the read-side read bit lines from influencing a signal stored at one of said memory cells while enabling the signal stored at said one of said memory cells to influence said one of said read-side intermediate nodes;

a plurality of unidirectional write-side isolation devices, each of said unidirectional write-side isolation devices operatively connecting the first node of one of said memory cells to one of write-side intermediate nodes, and each of said unidirectional write-side isolation devices comprising a field-effect transistor having a gate terminal connected to the first node of one of said memory cells, a source terminal connected to the fixed voltage source and a drain terminal connected to said one of said write-side intermediate nodes, whereby each of said unidirectional write-side isolation devices substantially prevents one of the write-side read bit lines from influencing a signal stored at one of said memory cells while enabling the signal stored at said one of said memory cells to influence said one of said write-side intermediate nodes; and

a differential sense amplifier connected between said read-side read bit lines and said write-side read bit lines.

5,590,088

SEMICONDUCTOR MEMORY DEVICE WITH ENABLE SIGNAL CONVERSION CIRCUIT OPERATIVE FOR REDUCING CURRENT CONSUMPTION

Noriaki Sakurada, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

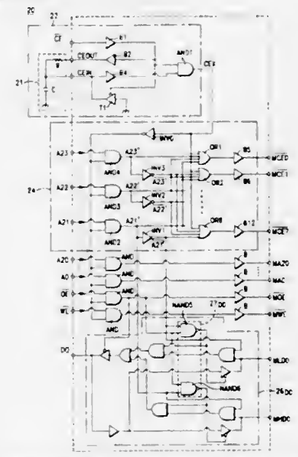
PCT No. PCT/JP94/01119, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO95/02885, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 7, 1994, Ser. No. 403,691

Claims priority, application Japan, Jul. 13, 1993, 5-173229

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233 **12 Claims**



1. In a semiconductor memory device having a semiconductor memory area containing memory cells, and an enable signal conversion circuit that converts an external enable signal delivered from outside said device into an internal enable timing signal for controlling internal enable signals to be applied to the semiconductor memory area, the enable signal conversion circuit causing the internal enable timing signal to be in an active state at all times when the external enable signal is in an active state, the improvement wherein said enable signal conversion circuit comprises an active state maintenance unit that maintains the internal enable signal in the active state for a specified period of time independently of a change in state of the external enable signal.

5,590,089

ADDRESS TRANSITION DETECTION (ATD) CIRCUIT

Frankie F. Roohparvar, Cupertino, Calif., assignor to Micron Quantum Devices Inc., Santa Clara, Calif.

Filed Jul. 25, 1995, Ser. No. 506,168

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233.5 **41 Claims**

26. A method of detecting address line transitions in a memory, comprising the steps of:

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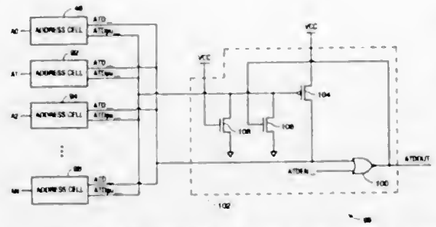


(a) generating a first pulse in a first node in response to a change in state of an address signal;

(b) generating a second pulse in a second node in response to a change in state of the address signal;

(c) accelerating assertion of the first pulse in response to assertion of the second pulse;

(d) generating an output pulse in an output node in response to the first pulse;

(e) feeding the output pulse back to be used to prepare for deassertion of the first pulse in response to the output pulse; and

(f) accelerating deassertion of the first pulse in response to deassertion of the second pulse.

5,590,090

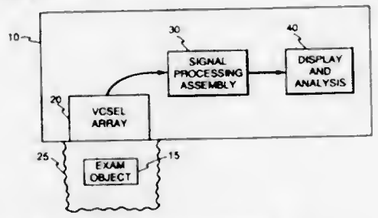
ULTRASONIC DETECTOR USING VERTICAL CAVITY SURFACE EMITTING LASERS

Anil R. Duggal, Schenectady, N.Y., and Christopher P. Yakymyshyn, Raleigh, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,833

Int. Cl.[6] H04R *23/00*

U.S. Cl. 367—7 **21 Claims**



14. An ultrasonic microscope comprising:

an electrically pumped vertical cavity surface emitting laser (VCSEL) array operatively positioned in the detector housing, each pixel of the array being a laser having a cavity length, the cavity length being modulated by an acoustic field;

an acoustic matching layer operatively positioned between the electrically pumped vertical cavity surface emitting laser (VCSEL) array and a sample to be imaged;

a transparent acoustic damping layer operatively connected to the VCSEL array, the VCSEL array generating an array of optical beams whose optical frequencies are modulated by the incident ultrasonic field, the beams being propagated through free space;and

a Fabry-Perot cavity, operatively positioned relative to the damping layer but separated therefrom, for converting the frequency modulation of the laser output caused by the acoustic disturbance into amplitude modulation.

5,590,091

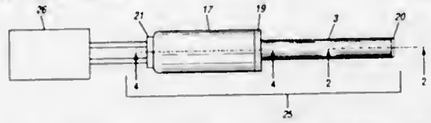
WAVEGUIDE SUSPENSION DEVICE AND MODULAR CONSTRUCTION FOR SONIC WAVEGUIDES

Michael L. Gloden, Apex, and Arnold F. Sprecher, Jr., Raleigh, both of N.C., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 439,507, May 11, 1995. This application Jul. 10, 1995, Ser. No. 500,335

Int. Cl.[6] H04R *15/00*

U.S. Cl. 367—140 **61 Claims**



1. A waveguide suspension for use with a waveguide and a return wire having an end remote from the electronics connected to the waveguide, comprising:

a suspension sleeve, said suspension sleeve having an inner tubular, nonconducting layer coaxial with and surrounding the waveguide; and

an outer tubular layer having means for maintaining the shape of said inner tubular layer;

said suspension sleeve extending over a length of the waveguide.

5,590,092

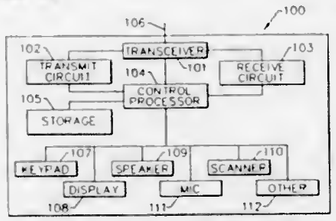
SYSTEMS AND METHODS FOR GENERATING A CURRENT TIME OF DAY IN A CELLULAR RADIOTELEPHONE

Michael D. Fehnel, Fuquay-Varina, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jan. 5, 1995, Ser. No. 369,164

Int. Cl.[6] G04B *47/00;* **G04C** *11/02;* **H01Q** *7/04*

U.S. Cl. 368—10 **39 Claims**



1. A method of generating a current time of day in a cellular radiotelephone which accepts cellular radiotelephone messages including overhead messages containing a Registration ID (REGID) field, said current time of day generating method comprising the steps of:

accepting a user indication of a time of day;

contemporaneous with said accepting step, monitoring the cellular telephone overhead messages to obtain a contemporaneous value of REGID;

determining a time interval between REGID updates in the cellular telephone overhead messages;

obtaining a difference between a current value of REGID and the contemporaneous value of REGID;

multiplying the difference by the time interval to obtain a result; and

adding the result and the accepted user indication of the time of day to obtain a current time of day.

5,590,093

DIGITAL SUNDIAL

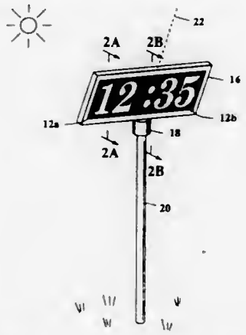
Hans Scharstein, Euskirchenerstr. 37, 53894 Mechernich; Werner Krotz-Vogel, Weserstr. 13, 53332 Bornheim, both of Germany, and Daniel Scharstein, 4 Pleasant View Ter., Middlebury, Vt. 05753

Filed Jun. 7, 1995, Ser. No. 487,343

Claims priority, application Germany, Sep. 7, 1994, 44 31 817.0; Sep. 7, 1994, 9414484 U

Int. Cl.[6] G04B *19/26;49/00;* **G04C** *19/00*

U.S. Cl. 368—15 **20 Claims**



1. A digital sundial comprising a digital display, said display comprising

(a) a light-casting mask that casts a predetermined light pattern when illuminated by a remote light source, and

(b) a light-selecting mask having opaque and transparent regions and being statically positioned at a predetermined orientation to and at a predetermined distance from said light-casting mask,

wherein said opaque regions block part of said light pattern, thereby creating at least two different images depending on the angular position of said light source with respect to said display.

5,590,094

SYSTEM AND METHD FOR REPRODUCING SOUND

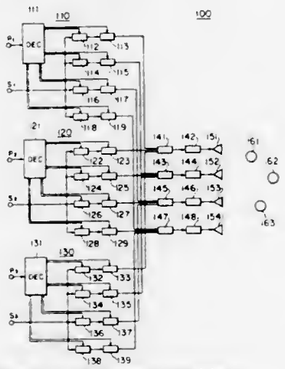
Kiyofumi Inanaga, Kanagawa, and Yuji Yamada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 980,836, Nov. 24, 1992, Pat. No. 5,367,506. This application Aug. 31, 1994, Ser. No. 298,818

Claims priority, application Japan, Nov. 25, 1991, 3-335623

Int. Cl.[6] H04B *1/20*

U.S. Cl. 369—4 **9 Claims**



1. A sound reproducing system, comprising:

reading out means for reading out audio signals and position signals from a plurality of independent audio channels, said audio channels having said audio signals as well as said position signals recorded in a multiplexed condition thereon, wherein said position signals represent at least original positions of sound sources of said audio signals upon the recording of said audio signals, or represent original positions of sound detecting means which have been used to detect sounds from said sound sources and to produce said audio signals;

adjusting means for synthetically adjusting amplitudes and delay times of said audio signals read out by said reading out means in order to produce an actual audio image in accordance with said position signals read out by said reading out means; and,

loudspeaker means for outputting as acoustic sound, said audio signals adjusted by said adjusting means.

5,590,095

MAGNETO-OPTICAL DISK APPARATUS WITH FLOATING TYPE MAGNETIC HEAD AND A DEVICE FOR LIMITING AN AMOUNT OF DEFLECTION OF A RESILIENT MEMBER SUPPORTING THE MAGNETIC HEAD

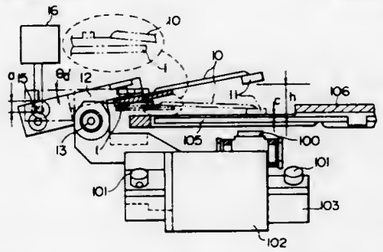
Masahiko Chaya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 936,502, Aug. 28, 1992, abandoned. This application Aug. 24, 1994, Ser. No. 295,141

Claims priority, application Japan, Aug. 30, 1991, 3-244154; Oct. 25, 1991, 3-305710

Int. Cl.[6] G11B *7/00;5/54;17/00*

U.S. Cl. 369—13 **25 Claims**



1. A magneto-optical disc apparatus for recording information on a magneto-optical recording medium using a floating type magnetic head, said apparatus comprising:

a floating type magnetic head;

a resilient member having a low spring constant for supporting said magnetic head on one end of said resilient member;

a supporting member for supporting said resilient member on the other end of said resilient member;

retreating means for moving said supporting member to retreat said magnetic head from a recording position to a non-recording position, wherein said retreating means retreats said magnetic head above the recording medium;

limiting means, fixed on one end of said supporting member, for limiting an amount of downward deflection of said resilient member caused when said retreating means retreats said magnetic head, wherein said limiting means contacts said resilient member to limit the amount of deflection of said resilient member in accordance with movement of said supporting member; and

means for maintaining said limiting means apart from said resilient member and allowing relative motion between said

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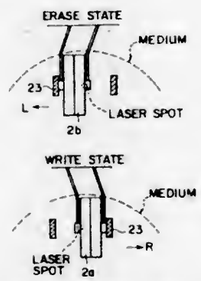
limiting means and said resilient member when said magnetic head is in the recording position.

5,590,096

REWRITABLE STORAGE APPARATUS USING FIRST AND SECOND BIAS MAGNETIC FIELDS

Masaoki Ohtsuka, Kawasaki; Teruji Yamakawa, Yokohama, and Tetsuo Maruyama, Hyogo, all of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 18, 1994, Ser. No. 341,743
Claims priority, application Japan, Jan. 31, 1994, 6-009423
Int. Cl.[6] G11B *11/00*
U.S. Cl. 369—13 **14 Claims**



1. A rewritable storage apparatus which, when new data is recorded in an area on a medium, performs an erase operation to erase data recorded in said area by applying a second bias magnetic field for data erasing to said area then performs a record operation to record said new data by applying a first bias magnetic field for data recording to said area, comprising:

a bias application unit for applying said bias magnetic field to said medium, said bias magnetic field being switchable between said first bias magnetic field and said second bias magnetic field; and

a bias control means for controlling said bias application unit so that said second bias magnetic field for data erasing is applied to said medium directly after said record operation is finished and said second bias magnetic field for data erasing is maintained.

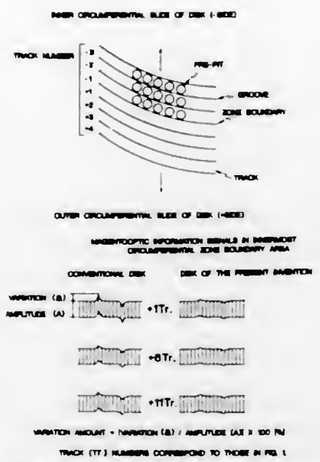
5,590,097

MAGNETOOPTIC RECORDING MEDIUM

Akira Kashiwakura, Yuuki-gun; Katsusuke Shimazaki, Kitasouma-gun; Masafumi Yoshihiro, Yuuki-gun; Shin-Itsu Kinoshita, Toride; Norio Oota, Kitasouma-gun, and Hisanori Sugiyama, Tsukube, all of Japan, assignors to Hitachi Maxell, Ltd., Ibaraki-ken, Japan

Filed Dec. 15, 1994, Ser. No. 356,547
Claims priority, application Japan, Dec. 15, 1993, 5-343732
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—13 **11 Claims**

1. A magnetooptic recording medium comprising a substrate and a magnetooptic recording film thereon, said medium having, on said substrate, a plurality of tracks on which magnetooptic recording signals are recorded, a part of said tracks selected from the plurality of tracks including clusters of pre-pits having pre-pit densities of at least 2×10^5 pre-pits/mm^2, wherein $(a/A)\leqq20\%$ is satisfied, provided that (a) is a difference in magnitude between a variation in light amount detected in a track region within 10 tracks from the tracks including the cluster of pre-pits and a variation in light amount (A) detected in a track region other than the track region, when signals from the tracks with recorded magnetooptic



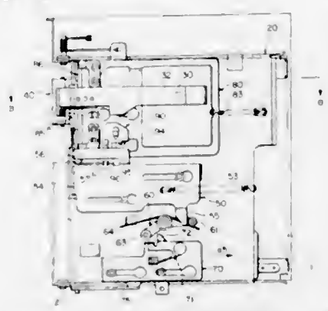
recording signals are measured by changes in light amount on the basis of Kerr rotational angles of reflected light from the medium.

5,590,098

MAGNETOOPTICAL RECORDING AND REPRODUCING APPARATUS HAVING AN AUTOMATIC HEAD LIFTING DEVICE

Jae-Yong Eom, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Division of Ser. No. 131,540, Oct. 5, 1993, Pat. No. 5,450,377.
This application Jun. 6, 1995, Ser. No. 470,041
Claims priority, application Rep. of Korea, Oct. 5, 1992, 92-18175; Jun. 1, 1993, 93-9795; Jun. 1, 1993, 93-9798; Jun. 1, 1993, 93-9800
Int. Cl.[6] G11B *13/04;21/12*
U.S. Cl. 369—13 **3 Claims**



1. A magnetooptical recording/reproducing apparatus for recording/reproducing information, using a disk cartridge which houses a magnetooptical disk in a rotatable state, said apparatus having a deck on which the disk cartridge is loaded, an optical pickup assembly movably seated on the deck to project a focused light beam onto one surface of the magnetooptical disk, and a magnetic head for applying a magnetic field onto the other surface of the magnetooptical disk, said apparatus comprising:

a cartridge holding member which receives the disk cartridge when the disk cartridge is inserted into the apparatus, said cartridge holding member being pivotally mounted with respect to the deck, so that the disk cartridge can be moved between a closing position, in which the disk cartridge is

loaded on the top of the deck, and an opening position in which the received disk cartridge is detached from the top of the deck, when the disk cartridge is received in the apparatus;

ejecting means for ejecting the disk cartridge from the cartridge holding member in response to movement of the cartridge holding member from the closing position to the opening position, said ejecting means comprising an ejecting member for pushing the disk cartridge received in the cartridge holding member in the ejecting direction, a locking means for locking the ejecting member, and a locking releasing means interlocked with the cartridge holding member to move the locking means, said locking releasing means being movable and having a one-direction elastic operation means which operates the locking member when moved in one direction and does not operate the locking member when moved in the opposite direction;

a connecting member pivotally connecting the magnetic head and the optical pickup assembly so that the magnetic head moves together with the optical pickup assembly in the radial direction of the magnetooptical disk and the magnetic head is pivotal in a movement direction of the cartridge holding member with respect to the optical pickup assembly; and

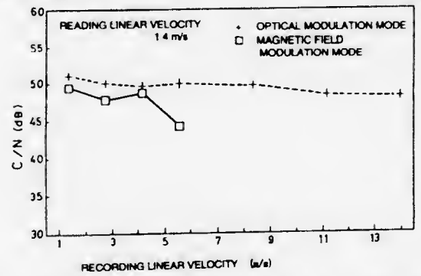
magnetic head lifting means interlocked with a recordable disk cartridge which is inserted into and extracted from the cartridge holding member, so as to lower the magnetic head toward the magnetooptical disk of the recordable disk cartridge.

5,590,099

MAGNETO-OPTICAL RECORDING METHOD AND METHOD FOR MAKING INFORMATION-CARRYING MAGNETO-OPTICAL RECORDING MEDIUM

Gichi Shibuya, Chiba; Masanori Shibahara, Nagano; Suguru Takayama, Chiba, and Hajime Utsunomiya, Nagano, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 11, 1995, Ser. No. 570,471
Claims priority, application Japan, Dec. 19, 1994, 6-334523
Int. Cl.[6] G11B *11/00;13/00*
U.S. Cl. 369—13 **6 Claims**



1. A method for recording information in a magneto-optical recording medium including a groove having a wobble, which is operated in a recording/reading apparatus adapted to carry out recording and reading operation in a magnetic field modulation mode, comprising the steps of

recording information while controlling a recording linear velocity in accordance with the wobble, and

recording address-related information at the end of recording,

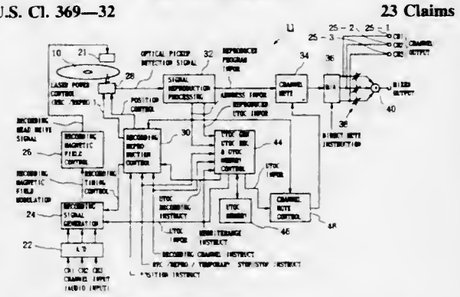
wherein the recording of information for a first time being carried out in an optical modulation mode at a linear velocity which is higher than a reading linear velocity.

5,590,100

INFORMATION RECORDING/REPRODUCING TECHNIQUE TO RECORD PLURAL-CHANNEL INFORMATION FOR SUBSEQUENT SIMULTANEOUS REPRODUCTION

Mikio Ogusu, and Kazunobu Fujiwara, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed May 17, 1995, Ser. No. 444,844
Claims priority, application Japan, Jun. 3, 1994, 6-145548
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—32 **23 Claims**



1. A recording device comprising:

recording means for recording program information of plural channels onto a recording medium in such a manner that said program information of the plural channels can be simultaneously reproduced from said recording medium; and

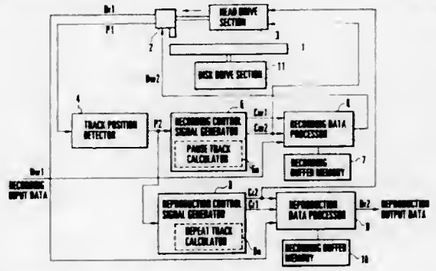
reproduction information generation means for, with respect to said program information recorded on said recording medium, generating reproduction information, wherein the reproduction information comprises either information that indicates each position of the program information to be reproduced, or information that indicates each position of the program information to be silenced, or both.

5,590,101

TRACK JUMP CONTROLLER FOR OPTICAL DISK RECORDING

Satoshi Itoi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 31, 1995, Ser. No. 455,980
Claims priority, application Japan, May 31, 1994, 6-117779; Jul. 27, 1994, 6-175613; Oct. 24, 1994, 6-257816
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—32 **41 Claims**



1. An optical disk apparatus comprising:

an optical disk has a recording area constituted by a plurality of equal clock blocks obtained by dividing a track area in a radial direction, the optical disk rotates at a constant rotational speed in synchronism with one of a frame frequency and a field frequency of recording data;

an optical head for optically recording data on said optical disk;

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recording buffer memory in which data to be recorded on said optical disk is temporarily written at a constant bit rate;

recording control means for reading out the data from said recording buffer memory while changing the bit rate for each clock block of said optical disk, and recording the readout recording data on said optical disk with an almost constant recording wavelength; and

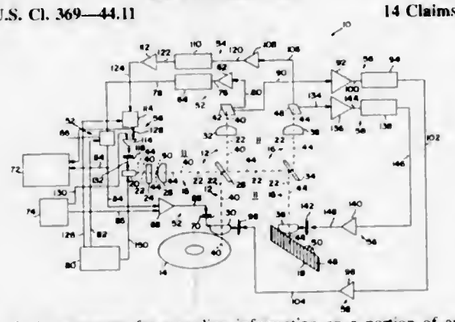
pause track calculation means for setting a track next to a track defined by R<Nt as a pause track for performing timing adjustment by moving said optical head backward by one track, wherein a track number in a clock block is Ct (Ct=0, 1, 2, . . . , n), the number of data blocks per track is Nt, the number of data blocks per frame or field is Nf, a constant determined by a capacity of said buffer memory is R, and a value of R−(Nt−Nf) is substituted into a value of the constant R as track number Ct is sequentially incremented from 0, and notifying said recording control means of a pause track timing upon setting a track next to a track defined by R<Nt as a pause track when the value of R−(Nt−Nt) is substituted into an updated value of the constant R obtained by adding the number (Nf) of data blocks to the value of the constant R obtained when timing adjustment is performed as track number Ct is incremented with respect to all track numbers in each of subsequent clock blocks.

5,590,102

RECORDING INFORMATIOIN ON AN OPTICAL DISC WITHOUT USING PRE-MANUFACTURED TRACKS

Ludwig Ceshkovsky, Fountain Valley, Calif., assignor to Discovision Associates, Irvine, Calif.

Filed Jan. 12, 1995, Ser. No. 371,350
Int. Cl.[6] G11B *7/095*
U.S. Cl. 369—44.11 **14 Claims**



1. An apparatus for recording information on a portion of an optical disc that rotates about an axis and does not have pre-manufactured tracks for recording information comprising:

a radiation source for emitting radiant energy;

a first optical system for impinging a first beam of said radiant energy on the optical disk;

a second optical system for producing a second beam of said radiant energy;.

a reference scale for controlling a spacing between information tracks being formed on the optical disc while recording information thereon, said reference scale having spaced apart indicia representing a pitch between the information tracks, wherein said second beam impinges on said reference scale and interacts therewith to define a third beam, and wherein said reference scale is stationary with respect to the axis of the optical disc;

a movable carriage carrying a portion of said first optical system and said second optical system, wherein movement of said carriage displaces said second beam along a longitudinal axis of said reference scale;

a coarse tracking means responsive to said third beam for coarsely positioning said second beam along said reference scale; and

a fine tracking means responsive to said third beam for finely positioning said second beam along said reference scale;

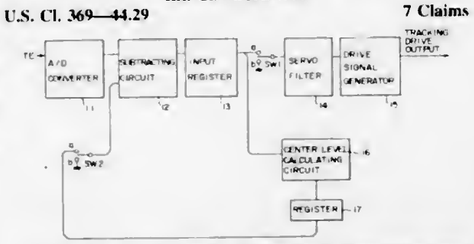
wherein said first beam radially advances across the surface of the rotating optical disc in correspondence with the displacement of said second beam along said reference scale.

5,590,103

TRACKING SERVO CIRCUIT FOR AN OPTICAL DISC PLAYER

Hidenobu Noda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 149,374, Nov. 9, 1993, abandoned. This application Feb. 3, 1995, Ser. No. 384,614
Claims priority, application Japan, Nov. 13, 1992, 4-328577
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—44.29 **7 Claims**



1. A tracking servo circuit for an optical disc player comprising:

optical head means for recording and/or reproducing a signal on an optical disc;

tracking error signal generating means for generating a tracking error signal indicative of an offset of said optical head means from a data track;

tracking servo means responsive to said tracking error signal for controlling a relative position of said optical head means with respect to said data track;

first switching means for turning off said tracking servo means for a certain period during initialization of said optical disc player and for turning on said tracking servo means after said certain period;

center level calculating means for receiving said tracking error signal obtained during said certain period when said tracking servo means is off and for calculating the center level of said tracking error signal;

register means for holding said center level calculated by said center level calculating means;

level adjusting means coupled between said tracking error signal generating means and said tracking servo means, for adjusting said tracking error signal with said center level held in said register means when said tracking servo means is on after said certain period, wherein said tracking servo means controls said relative position between said data track and said optical head means based on the adjusted tracking error signal from said level adjusting means; and

second switching means coupled between said register means and said level adjusting means for interrupting a signal path between said register means and said level adjusting means for said certain period during the initialization and for providing said signal path therebetween after said certain period.

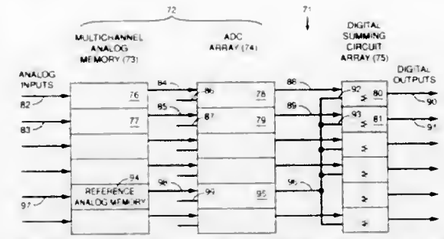
5,590,104

METHOD OF PEDESTAL AND COMMON-MODE NOISE CORRECTION FOR SWITCHED-CAPACITOR ANALOG MEMORIES

Charles L. Britton, Alcoa, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Sep. 30, 1994, Ser. No. 316,193
Int. Cl.[6] G11C *27/00*
U.S. Cl. 365—45 **3 Claims**

1. In a multichannel array of switched-capacitor analog memories wherein each analog memory is connected to an associated analog-to-digital converter, a method of correcting common-mode noise and pedestal noise comprising the steps of:



dividing the analog memories into groups based on the commonality of the group's noise source inputs;

providing a single differential element for each of said groups of analog memories;

generating differential common-mode correction signals in said single differential elements for correcting the noise source inputs of each of said groups of analog memories;

providing digital summing circuits corresponding to each of said analog-to-digital converters, said summing circuits having first and second inputs;

connecting the output leads of each of said analog-to-digital converters to said first inputs of said digital summing circuits; and

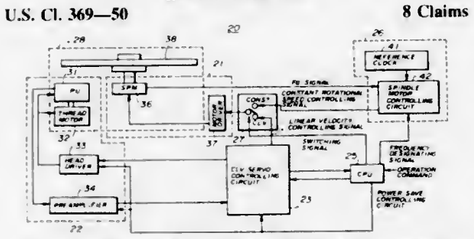
applying said correction signals to said second inputs of said digital summing circuits.

5,590,105

DISK APPARATUS USING CONSTANT LINEAR VELOCITY METHOD AND HAVING HEAD FUNCTION STOPPED IN STANDBY MODE

Katsuya Enami, Higashikurume, and Tohru Miura, Chofu, both of Japan, assignors to TEAC Corporation, Japan

Filed Mar. 15, 1995, Ser. No. 404,638
Claims priority, application Japan, Mar. 30, 1994, 6-061533
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—50 **8 Claims**



1. A disk apparatus using a constant linear velocity method by which method a recording/reproducing operation of information on a disk is performed while the disk is rotated at a variable speed so that the linear velocity of a head relative to the disk is maintained constant, the disk apparatus comprising:

disk driving means for rotating said disk;

head driving means for driving said head;

linear velocity controlling means for controlling a rotational speed of said disk so that the linear velocity of said head relative to said disk is maintained constant;

constant rotational speed controlling means for rotating said disk at a constant rotational speed;

switching means for switching control of said disk driving means so as to be performed by either one of said linear velocity controlling means and said constant rotational speed controlling means, the control of said disk driving means being switched to said linear velocity controlling means in a state in which the recording/reproducing operation is performed by said head, the control of said disk driving means being switched to said constant rotational speed controlling means in a state in which the recording/reproducing operation is not performed by said head; and

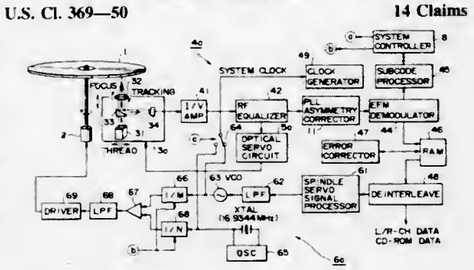
stopping means for stopping an operation of said head driving means while said disk driving means is controlled by said constant rotational speed controlling means.

5,590,106

DISC PLAYER HAVING A PLURALITY OF READING MEANS FOR READING INFORMATION ON A DISC

Kazutoshi Shimizume, and Mamoru Akita, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Nov. 21, 1995, Ser. No. 561,234
Claims priority, application Japan, Nov. 25, 1994, 6-291018
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—50 **14 Claims**



1. A disc player comprising:

a spindle motor for rotationally driving a disc;

a plurality of reading means for reading information recorded on said disc;

clock generating means for detecting a speed difference between spindle rotational speed and target rotational speed based on each of read signals of said plurality of reading means to generate a system clock of which frequency varies according to the detected speed difference;

a plurality of spindle servo means for detecting a phase difference between said system clock and a reference clock to output a servo error signal corresponding to the detected phase difference;

a plurality of signal processing means for processing each of the read signals of said plurality of reading means based on said system clock;

selecting means for selecting one of the output signals of said plurality of spindle servo means to supply the selected signal to said spindle motor; and

control means for controlling said selecting means so as to select a servo error signal based on the read signal of one reading means of said plurality of reading means that is performing a reading operation.

5,590,107

INFORMATION PROCESSING APPARATUS FOR ADDING HANDWRITTEN DATA TO A MAGNETO-OPTICAL DISC DATABASE

Masayuki Chatani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 217,798, Mar. 24, 1994, abandoned. This application Mar. 5, 1996, Ser. No. 611,415
Claims priority, application Japan, Mar. 31, 1993, 5-072701
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—54 **15 Claims**

5. An information processing apparatus for use with a hybrid disc having a read-only area and a read/write area, the information processing apparatus comprising:

a processing unit;

a recording and reproducing unit for reproducing read-only data from the read-only area of the disc and for sending the read-only data to the processing unit;

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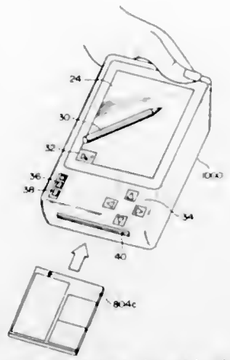


a display for receiving at least the read-only data from the processing unit and for displaying at least the read-only data; and

an input means for inputting of coordinate data from a user by handwriting and for sending the coordinate data to the processing unit;

wherein the processing unit has means for processing the coordinate data to generate modifier data which represents a holograph corresponding to the coordinate data, the processing unit sends the modifier data to the recording and reproducing unit, and the recording and reproducing means has means for writing the modifier information to the read/write area of the disc.

5,590,108

ENCODING METHOD AND APPARATUS FOR BIT COMPRESSING DIGITAL AUDIO SIGNALS AND RECORDING MEDIUM HAVING ENCODED AUDIO SIGNALS RECORDED THEREON BY THE ENCODING METHOD

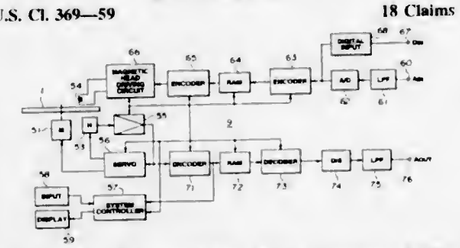
Makoto Mitsuno, Chiba; Kenzo Akagiri, Kanagawa; Hiroshi Suzuki, Saitama, and Osamu Shimoyoshi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 10, 1994, Ser. No. 240,234

Claims priority, application Japan, May 10, 1993, 5-108006

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—59 **18 Claims**



1. A method for encoding audio signals comprising dividing input audio signals into a two-dimensional block of time and frequency and quantizing the two-dimensional blocks based upon bit allocation as determined for each of the two-dimensional blocks,

wherein the improvement comprises the steps of

calculating scale factors indicating characteristics of signal components for each of the plural two-dimensional blocks, and

determining bit allocation for a pre-set one of the two-dimensional blocks based upon the scale factor of the pre-set two-dimensional block and plural scale factors of plural ones of the two-dimensional blocks neighboring to said pre-set two-dimensional block on the frequency axis.

5,590,109

DISC APPARATUS

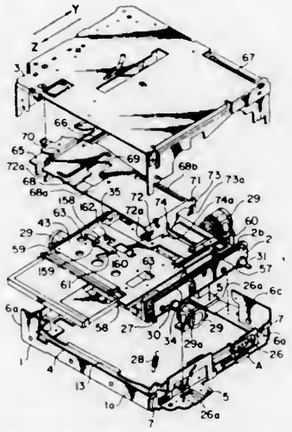
Eiichi Ookawa, Iwate-ken; Hiroto Nishida, Ishikawa-ken; Takashi Suzuki, Tokyo; Hitoshi Watanabe, Morioka, and Toshiaki Sasaki, Chofu, all of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed Sep. 9, 1994, Ser. No. 301,992

Claims priority, application Japan, Sep. 17, 1993, 5-231185; Sep. 17, 1993, 5-231216; Sep. 17, 1993, 5-231217

Int. Cl.[6] G11B *33/02;17/04*

U.S. Cl. 369—77.2 **2 Claims**



1. A disc apparatus comprising:

a stationary chassis;

a movable chassis supported to said stationary chassis by means of resilient means;

a lock pin provided on said movable chassis;

a holder provided movably on said movable chassis, for holding a disc cartridge thereon and for loading and ejecting said disc cartridge;

a loader provided on the stationary chassis, for conveying said holder in a predetermined conveying direction to move said disc cartridge in a loading direction and in an ejecting direction, said loader having an engaging groove formed therein;

a lever provided on said stationary chassis, said lever being engaged in said engaging grove, when said loader moves in said conveying direction, so as to be rotated relative to said stationary chassis;

a lock member provided on said stationary chassis and engaged with said lever so as to move in said conveying direction in association with rotation of said lever; and

a pin actuating means provided on said loader for (i) engaging with said lock pin so as to lock said movable chassis to said stationary chassis when said lock member moves in said loading direction and (ii) disengaging from said lock pin so as to release said movable chassis from said stationary chassis when said lock member moves in said ejecting direction.

5,590,110

SUPER-RESOLUTION OPTICAL HEAD USING OPTICAL SEPARATOR

Masahiko Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

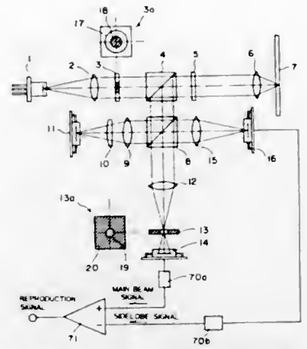
Filed Dec. 27, 1994, Ser. No. 363,939

Claims priority, application Japan, Dec. 28, 1993, 5-334561

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—100 **7 Claims**

1. A super-resolution optical head device in which a first super-resolution spot having a diameter smaller than that of a diffraction limit is formed on a recording medium by partially modulating at



least one of a phase and an intensity of laser beams emitted from a laser light source, said super-resolution optical head device comprising:

an optical system by which laser beams reflected from said recording medium are converged and a second super-resolution spot is reimaged;

a separating means for optically separating said second super-resolution spot into a main beam component and a sidelobe component; and

a plurality of optical detectors, wherein said separating means independently lead said main beam component and said sidelobe component to respective optical detectors.

5,590,111

METHOD OF CONTROLLING RECORDING OF OPTICAL RECORDS

Fumiyoshi Kirino, Tokyo; Takeshi Maeda, Kokubunji; Hiroshi Ide, Kodaira; Toshimitsu Kaku, Sagamihara; Seiichi Mita, Kanagawa-ken; Kazuo Shigematsu, Saitama-ken, and Tsuyoshi Toda, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 720,706, Jun. 25, 1991, and Ser. No. 764,922, Sep. 24, 1991, which is a continuation-in-part of Ser. No. 720,706, Jun. 25, 1991. This application Jul. 13, 1993, Ser. No. 91,003

Claims priority, application Japan, Jun. 29, 1990, 2-170052; Sep. 28, 1990, 2-256904; Nov. 11, 1991, 3-294145; Feb. 13, 1992, 4-026508; Feb. 13, 1992, 4-026509; Feb. 13, 1992, 4-026511; Apr. 21, 1992, 4-100897; Jul. 14, 1992, 4-186586; Sep. 4, 1992, 4-236969

Int. Cl.[6] G11B *7/00;3/90;5/09;20/10*

U.S. Cl. 369—116 **10 Claims**

1. A control method of controlling recording and reproducing of optical records in an optical magnetic disk apparatus using a mark length recording method, comprising the steps of:

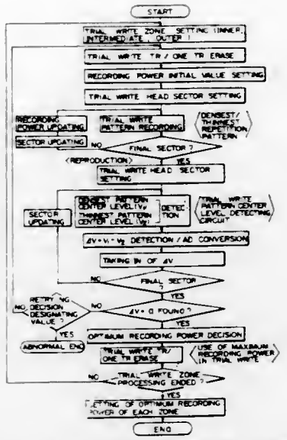
recording a predetermined test pattern on a recording medium;

reproducing said predetermined test pattern;

controlling at least one shift amount selected from a defocus amount of a laser beam on a recording medium, a position shift amount of a recording position on a track at which recording is performed on said recording medium and a power shift amount of laser power irradiated during recording, to reduce a distortion of the reproduced said predetermined test pattern to less than a first predetermined value;

obtaining control information under various environments in which optical recording and reproducing are performed, by repeating said steps of recording, reproducing said predetermined test patterns and controlling;

recording general data on said recording medium by setting an optimum pulse width or an optimum laser power for recording on a basis of said control information; and



reproducing said general data by subjecting a reproduced said general data to wave-equalizing processing, to reduce a distortion of said general data reproduced to less than a second predetermined value which is less than said first predetermined value.

5,590,112

TRACK JUMP CONTROLLER FOR CORRECTING INFORMATION READ ERRORS

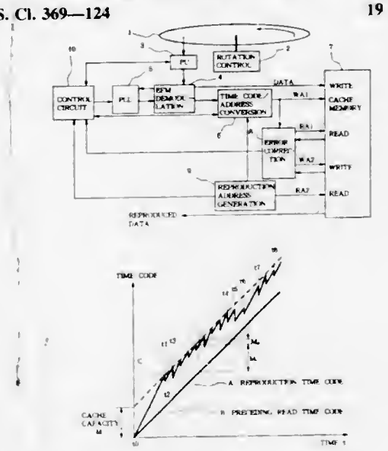
Morito Morishima, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 6, 1994, Ser. No. 349,767

Claims priority, application Japan, Dec. 8, 1994, 5-340670

Int. Cl.[6] G11B *27/34;7/00*

U.S. Cl. 369—124 **19 Claims**



9. An optical disc reproducing device comprising:

a data pickup part that reads out data and time codes recorded on an optical disk along tracks formed thereon;

a rotation control part that rotates the optical disc such that the data pickup part is allowed to read out the data faster than a predetermined reproduction speed;

a storage device that stores the data read out by the data pickup part at addresses corresponding to the time codes;

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a readout part that sequentially reads out the data stored in the storage device at the predetermined reproduction speed; and

a control part that, when an amount of data in the storage means which has not yet been read out by the readout part reaches a predetermined value, returns the data pickup part to any of the tracks from which the data has already been read out by the data pickup part.

5,590,113

DISC CLAMPING DEVICE FOR SELECTIVELY CLAMPING A COMPACT DISC IN A UNITED DEVICE

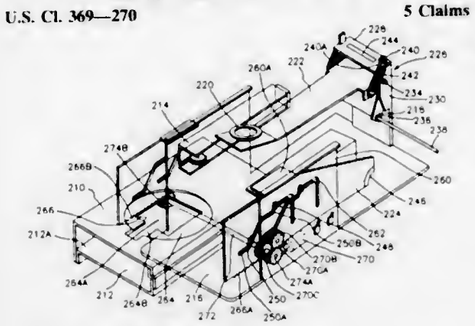
Youngsuk Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 23, 1994, Ser. No. 363,344

Claims priority, application Rep. of Korea, Dec. 28, 1993, 93-30146

Int. Cl.[6] G11B *17/035;17/04;33/02*

U.S. Cl. 369—270 **5 Claims**



1. A disc clamping device comprising:

a tray holder having first guide bars outwardly projecting from side walls thereof, said tray holder receiving a disc tray for loading a first naked disc thereon, and a cartridge tray for loading a second disc encased in a cartridge thereon and having a size smaller than that of said first naked disc;

a moving plate having side portions for guiding a horizontal and inclined movement of said first guide bars and a guide plate for guiding a linear movement of said moving plate, said side portions each provided with a first stepped cut portion into which said first guide bars are inserted, an arcuate portion defined in a lower corner of a rear end of said moving plate, a rack gear formed in a lower edge of said moving plate, and said guide plate formed incorporated with an upper part of said moving plate;

a base plate including two side walls, each of said side walls having a first reversed "L" shaped cut-out portion into which said first guide bars are inserted;

a loading means fixed to said base plate for driving said rack gear; and

a clamping means having a supporter mounted to a rear end of said base plate, a clamper arm folded so as to pivot about a hinged shaft of said supporter, a rotating body integrally formed with said clamper arm and positioned between said clamper arm and said supporter, an actuating rod projected on a lower side surface of said rotating body, and a clamper mounted on a forward portion of said clamper arm folded at an angle to the rest of said clamper arm, said actuating rod being forced to pivot by said arcuate portion of said moving plate, so that said clamping means selectively clamps said first naked disc when said disc tray is loaded.

5,590,114

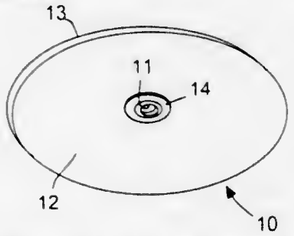
COMPACT DISC PLAYBACK ENHANCER

John P. Murphy, 37508 Grove Ave., Willoughby, Ohio 44094, assignor to John P. Murphy, Willoughby, Ohio

Continuation of Ser. No. 884,283, May 13, 1992, abandoned, which is a continuation of Ser. No. 283,127, Dec. 12, 1988, abandoned. This application May 26, 1995, Ser. No. 453,072

Int. Cl.[6] G11B *7/24;33/14*

U.S. Cl. 369—290 **10 Claims**



1. In combination with a player having a spinning mechanism, a data storage disc for being read in the player, the data storage disc comprising:

a pulse code modulated optical disc having a first side and a second side, the data storage disc having a data retrieval portion on the first side from which data is retrieved by the player and having a drive portion on the first side;

an annular dampening and friction component ring on the first side of the optical disc for engagement by the spinning mechanism, the ring substantially covering the drive portion and leaving the data retrieval portion completely uncovered, the ring made from a soft flexible material and having a friction coefficient greater than that of the optical disc for simultaneously

absorbing and dampening vibration of the optical disc and reducing the transmission of vibrations between the optical disc and the spinning mechanism and

improving the frictional engagement of the optical disc with the spinning mechanism,

the soft and flexible material having a Shore A hardness of between 0 and 100; and

a flexible dampening adhesive layer for adhering the ring to the drive portion of the optical disc, the adhesive layer covering the drive portion and leaving the data retrieval portion completely uncovered, the adhesive layer being non-rigid and pliable and made from a soft flexible material for absorbing and dampening and reducing the transmission of vibrations between the optical disc and the spinning mechanism, the adhesive layer interposed between the drive portion of the disc and the spinning mechanism.

5,590,115

OPTICAL DISK AND APPARATUS FOR MANUFACTURING THE SAME

Toyohide Kubo, Tokushima, Japan, assignor to Awa Engineering Co., Ltd., Tokushima, Japan

Continuation of Ser. No. 78,051, Jun. 18, 1993, abandoned. This application Aug. 29, 1995, Ser. No. 521,023

Claims priority, application Japan, Jun. 22, 1992, 4-188663

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—290 **20 Claims**

1. An optical disk comprising:

a plastic disk having a central plate-receiving part;

a clamping plate mounted in said central plate-receiving part of said plastic disk and retained in said central plate-receiving part of said plastic disk by a heat pressed and deformed portion of said plastic disk at a periphery of said central plate-receiving part of said plastic disk;

wherein said heat pressed and deformed portion of said plastic disk has been discontinuously heat pressed so as to form heat pressed segments with circumferentially spaced apart gaps therebetween and so as to connect said clamping plate to said plastic disk;

wherein said clamping plate includes a circular central part and an annular outer part surrounding said central part;

wherein a radial gap is formed between an inner peripheral edge of said discontinuously heat pressed and deformed portion of said plastic disk and a radially outwardly facing edge of said central part of said clamping plate;

wherein an annular gap is formed between said periphery of said central plate-receiving part of said plastic disk and a periphery of said annular part of said clamping plate, such that said clamping plate is radially movably disposed in said central plate-receiving part;

wherein said circumferentially spaced apart gaps between said projection segments constitute means for viewing, along an axial direction, segments of said annular gap at circumferentially spaced apart locations thereof; and

wherein, when said clamping plate is concentric with said plate-receiving part, said heat pressed and deformed portion of said plastic disk does not contact said circular central part of said clamping plate.

5,590,116

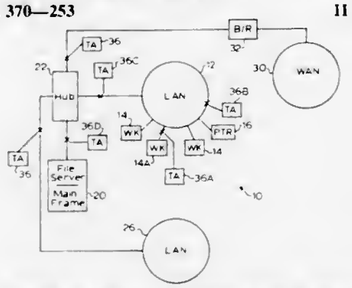
MULTIPORT ANALYZING, TIME STAMP SYNCHRONIZING AND PARALLEL COMMUNICATING

Jing Zhang, Durham, N.C., assignor to Wandel & Goltermann Technologies, Inc., Research Triangle Park, N.C.

Filed Feb. 9, 1995, Ser. No. 385,288

Int. Cl.[6] H04J *1/16*

U.S. Cl. 370—253 **11 Claims**



1. An analyzer for digital transmission networks with multiple ports, said analyzer having data packet analyzing capability, a facility for participating in an analysis with at least one other analyzer with which said analyzer is synchronized and in intercommunication outside of the digital transmission networks under the analysis, for said analysis at least two ports of a digital transmission network, said analyzer including:

a clock having an output and constituting a part of said analyzer;

a counter, the output of which is used to time stamp data packets received by said analyzer, the input of the counter being interconnectable with the output of the clock of said other analyzer;

the output of said clock being interconnectable with the input of the counter of said analyzer and to the input of the counter of said other analyzer;

a clock control circuit for selectively interconnecting the clock of said analyzer to the counter of said analyzer and to the counter of said other analyzer, and for disconnecting the clock of said analyzer from the counter of said analyzer in response to a clock-disable signal received by said analyzer from a source external to said analyzer, thereby allowing the clock output of said other analyzer to substitute for the output of the disconnected clock of said analyzer;

at least one receive-transmit circuit, having a receive mode and a transmit mode, for intercommunicating, separately from said digital transmission network, in either direction with said other analyzer; and

a receive-transmit control circuit for controlling the transmission and reception capability of the receive-transmit circuit in response to a command from a source external to said analyzer.

5,590,117

NODE INFORMATION COLLECTING METHOD IN A RING SYSTEM

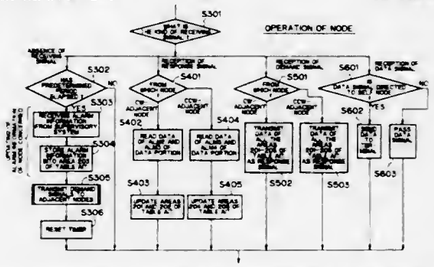
Shuichi Iida, Tokyo, and Masayuki Oyama, Miyagi, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 413,102

Claims priority, application Japan, Mar. 29, 1994, 6-059524

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—248 **12 Claims**



1. A method for collecting node information in a ring network comprising a plurality of nodes, the method comprising the steps of:

retaining self-node information in each of the nodes at predetermined time intervals; and

accessing two adjacent nodes clockwise and counterclockwise adjacent to each of the nodes to collect node information retained in the two adjacent nodes at the predetermined time intervals so that each of the nodes stores node information of all the nodes.

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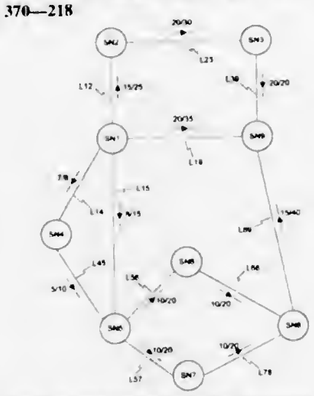
5,590,118
METHOD FOR REROUTING A DATA STREAM

Leo Nederlof, Antwerp, Belgium, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Aug. 23, 1995, Ser. No. 518,268
Claims priority, application European Pat. Off., Aug. 23, 1994, 94202415; Aug. 3, 1995, 95202121
Int. Cl.[6] H04L *12/24;* **G06F** *11/20*
U.S. Cl. 370—218 **33 Claims**



1. A method for rerouting, upon failure of a route, a data stream previously routed via said route through a switching network which includes a plurality of switching nodes (SN1..SN9) with respective addresses (1..9) and interconnected by respective links (L12..L89) used for setting up routes, and said method including the steps of:

detecting said failure of said route on one of said links (L19) between first (SN1) and second (SN9) said switching nodes in at least said first switching node (SN1);

transmitting from said first switching node (SN1) and on each but said one of said links connected to it, a request message (REQ) having first (IDA) and second (IDB) address fields containing addresses of said first (1) and second (9) switching nodes, respectively;

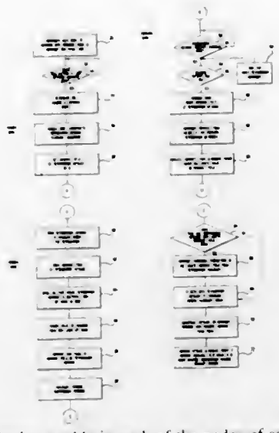
in each of said switching nodes having received said request message (REQ) on a link, retransmitting said request message (REQ) on each link connected to it but said link on which said request message (REQ) was received, until an alternative route for said data stream is found between two end switching nodes of said alternative route;

allocating said data stream to said alternative route and transmitting it thereon, characterized in that said allocation step is performed by a said end switching node (SN1) chosen amongst said two end switching nodes according to a predetermined rule, the choice being made after said alternative route has been found.

5,590,119
DETERMINISTIC SELECTION OF AN OPTIMAL RESTORATION ROUTE IN A TELECOMMUNICATIONS NETWORK

Carlos W. Moran, Dallas, and Louis S. Thibodeaux, Garland, both of Tex., assignors to MCI Communications Corporation, Washington, D.C.

Filed Aug. 28, 1995, Ser. No. 519,742
Int. Cl.[6] H04L *12/24;12/56*
U.S. Cl. 370—225 **29 Claims**



1. In a telecommunications network having a plurality of nodes interconnected by a plurality of working links and spare links, a method of ascertaining an optimal alternate route between first and second adjacent nodes for restoring traffic disrupted therebetween, comprising the steps of:

(a) provisioning a table in each of the nodes of said network to store respective weights each corresponding to a spare link connecting said each node and an adjacent other node;

(b) sending restoration messages from said first node to said second node via various spare links connecting the various nodes of said network to find alternate routes for restoring traffic between said first and second nodes, each restoration message including a field for storing a weighed identifier representative of the various spare links connecting the various nodes through which said each restoration message traverses;

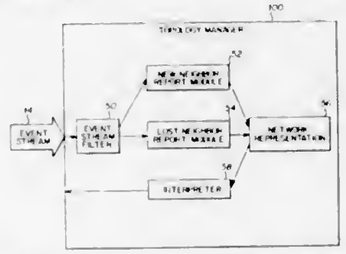
(c) using the appropriate weight provided in the table in each of the various nodes through which said each restoration message traverses to reweigh the identifier stored in said field of said each restoration message as said each restoration message traverses from said first node to said second node via the various spare links and the various nodes; and

(d) choosing from among the restoration messages received at said second node the restoration message with the best weighed identifier for establishing said optimal alternate route to restore the traffic disrupted between said first and second nodes.

5,590,120
PORT-LINK CONFIGURATION TRACKING METHOD AND APPARATUS

Vick Vaishnavi, Danville; Wallace Matthews, Northwood, and Patrick Kenny, Dover, all of N.H., assignors to Cabletron Systems, Inc., Rochester, N.H.

Filed Oct. 31, 1995, Ser. No. 550,630
Int. Cl.[6] H04J *3/14;* **H04L** *12/26*
U.S. Cl. 370—254 **35 Claims**



1. A method for tracking a configuration of a plurality of ports of a communications network, comprising the steps of:

(a) receiving a report that includes an indication that a reporting port has a connection to a neighbor port;

(b) determining whether the reporting port has been recently attached to any connection within the communications network;

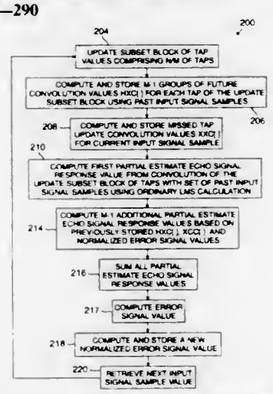
(c) determining whether the neighbor port has been recently attached to any connection within the communications network; and

(d) determining the configuration of the plurality of ports based upon whether the reporting port has been recently attached and whether the neighbor port has been recently attached.

5,590,121
METHOD AND APPARATUS FOR ADAPTIVE FILTERING

Alfred A. Geigel, Dunellen, and William E. Keasler, Tinton Falls, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 30, 1995, Ser. No. 413,643
Int. Cl.[6] G06F *17/10*
U.S. Cl. 370—290 **24 Claims**



1. A method for generating estimates of response signals that a system produces from input signal samples which are introduced to the system, the method comprising the steps of:

providing the input signal samples and the response signals at first and second inputs, respectively, of an adaptive finite impulse response (FIR) filter, wherein the FIR filter includes N taps;

storing the plurality of input signal sample values and the plurality of response signal values in a memory;

grouping the FIR filter taps into M subset blocks, wherein each subset block comprises N/M taps;

updating periodically values of taps of the M subset blocks such that only a fraction of the taps are updated at each sample;

computing future convolution values for a first input signal sample from the values of the taps in an update subset block convolved with the values of the past input signals samples;

storing the future convolution values in the memory;

computing missed update compensation convolution values using values of the past input signal samples in order to compensate for not updating all taps at the current first input signal sample;

storing the missed update compensation convolution values in the memory;

computing a first partial estimate response signal value from a first partial convolution of the tap values of the update subset block with the values of the past input signal samples;

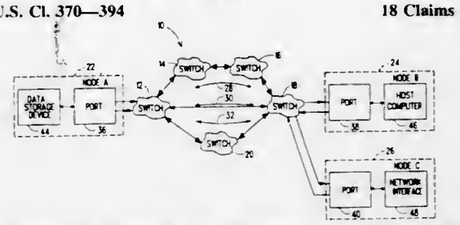
computing M−1 additional partial estimate response signal values based on previously stored values of future convolutions, missed update convolutions and normalized error signal values; and,

summing the first and the M−1 additional partial estimate response signal values to yield a first estimate response signal for the first input signal sample.

5,590,122
METHOD AND APPARATUS FOR REORDERING FRAMES

Miklos A. Sandorfi, Foxboro, and Moshe M. Shriki, Sharon, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Dec. 22, 1994, Ser. No. 363,392
Int. Cl.[6] H04L *12/56*
U.S. Cl. 370—394 **18 Claims**



1. Apparatus for reordering a plurality of frames of a packet transmitted to said apparatus and received by said apparatus out of order, comprising:

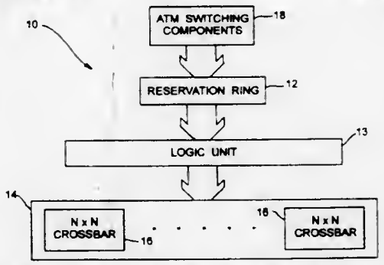
a frame manager responsive to said plurality of frames for providing a memory entry identifying that one of said plurality of frames is received by said apparatus non-consecutively with respect to a previously received one of said plurality of frames, said previously received one of said plurality of frames defining an end of a set comprising at least one consecutively received frame; and

a memory for storing a plurality of said memory entries associated with said packet.

5,590,123
DEVICE AND METHOD FOR USE OF A RESERVATION RING TO COMPUTE CROSSBAR SET-UP PARAMETERS IN AN ATM SWITCH

Joseph B. Lyles, Mountain View, and Alan G. Bell, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 23, 1995, Ser. No. 447,673
Int. Cl.[6] H04Q *11/04;* **H04J** *3/24*
U.S. Cl. 370—397 **20 Claims**



1. A switching fabric system for routing data packets in an ATM switch comprising:

a logic unit operatively connected to a reservation ring of the ATM switch, the logic unit intercepting from the reservation ring input port routing requests for routing associated data packets to selected output ports; and

a non-self-routing crossbar array arranged to receive output from the logic unit, the output used to set-up paths in the non-self-routing crossbar array for routing the associated data packets of the requesting input ports.

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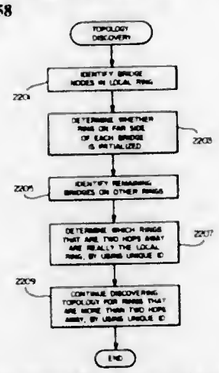
5,590,124
LINK AND DISCOVERY PROTOCOL FOR A RING INTERCONNECT ARCHITECTURE

Nicholas Robins, San Francisco, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Division of Ser. No. 57,913, May 7, 1993, Pat. No. 5,457,683. This application Jun. 7, 1995, Ser. No. 479,531
Int. Cl.[6] H04L *12/56*
U.S. Cl. 370—258 **2 Claims**



1. A method for ascertaining topology of a packet communication system having a ring interconnect architecture, the ring interconnect architecture comprising at least one ring, each ring comprising at least one node, each of said at least one node being selected from the group consisting of leaf nodes and bridge nodes, wherein each leaf node has a node identifier not shared by any other node on a same ring and a readable data source at a known address, and each bridge node is uniquely associated with a far side bridge node coupled to a far side ring, and wherein a packet received by a bridge node is delivered to the associated far side bridge node for placement on the far side ring only if the packet does not designate the bridge node as a final destination, and wherein a packet which designates a bridge node as a final destination is discarded by the designated bridge node, the method comprising the steps of:

sending a packet from an instigator node to a first known node on a first ring, the packet being encoded to solicit a first unique identifier stored at the first known node;

at the instigator node, receiving a packet containing the first unique identifier;

sending a packet from the instigator node to the first known node, the packet being encoded to solicit node identifiers of all nodes on the first ring;

at the instigator node, receiving a packet containing the solicited node identifiers of all nodes on the first ring;

using the node identifiers of all nodes on the first ring to send a packet from the instigator node to each node on the first ring, wherein the packet is encoded to solicit data from the readable data source of a partner node, and wherein when a partner node sends the solicited data to the instigator node, the solicited data is accompanied by a partner node identifier;

waiting for solicited data to return;

if solicited data is received by the instigator node from a responding node, then identifying the responding node having the accompanying partner node identifier as a first ring leaf node in the first ring;

if solicited data is not received from a nonresponding node within a predetermined time period, then identifying the nonresponding node as a first ring bridge node in the first ring, the first ring bridge node being associated with a far side bridge node in a second ring;

for each identified first ring bridge node, sending a packet from the instigator node through the identified first ring bridge node to a second known node on the second ring, the packet being encoded to solicit identifiers of all nodes on the second ring;

at the instigator node, receiving a packet containing the solicited node identifiers of all nodes on the second ring;

for each identified first ring bridge node, sending a second packet from the instigator node through the identified first ring bridge node to each node on the second ring, wherein the second packet is encoded to solicit data from the readable data source of a partner node, and wherein when a partner node sends the solicited data to the instigator node, the solicited data is accompanied by a partner node identifier;

waiting for solicited data to return;

if solicited data is received by the instigator node from a responding node, then identifying the responding node having the accompanying partner node identifier as a second ring leaf node in the second ring;

if solicited data is not received from a nonresponding node within a predetermined time period, then identifying the nonresponding node as a second ring bridge node in the second ring, the second ring bridge node being associated with a far side bridge node in a third ring;

for each identified second ring bridge node, sending a packet from the instigator node through the identified second ring bridge node to a third known node on the third ring, the packet being encoded to solicit a third unique identifier stored at the third node;

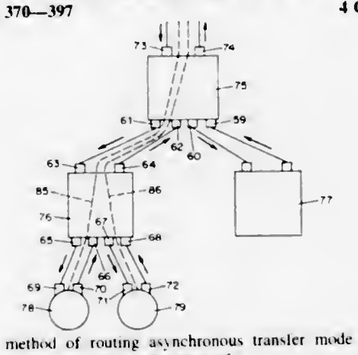
at the instigator node, receiving a packet containing the solicited third unique identifier; and

at the instigator node, determining whether the second ring bridge node is the associated far side bridge node of the first ring bridge node by determining that the first unique identifier is the same as the third unique identifier.

5,590,125
METHOD AND APPARATUS FOR SUPPORTING MOBILE COMMUNICATIONS IN ASYNCHRONOUS TRANSFER MODE BASED NETWORKS

Anthony S. Acampora, Freehold, N.J., and Mahmoud Naghshineh, Fishkill, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Division of Ser. No. 67,717, May 26, 1993. This application Jun. 5, 1995, Ser. No. 460,914
Int. Cl.[6] H04L *12/56;* **H04B** *7/26*
U.S. Cl. 370—397 **4 Claims**



1. A method of routing asynchronous transfer mode mobile communications comprising the steps of:

receiving a packet comprising a packet header, which in turn comprises an input virtual channel identifier for the packet, at a first input port of a multiport switch, the switch having a virtual channel identifier comparator at each input port, each comparator having read/write access to a routing lookup table which contains rows of routing information, each of the rows of routing information comprising an input virtual channel identifier, an input port, an output virtual identifier and an output port;

reading the input virtual channel identifier from the packet header;

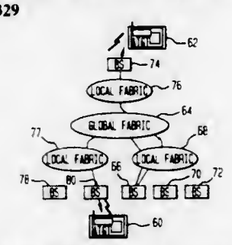
comparing the input virtual channel identifier read from the packet header with the input virtual channel identifiers contained in the routing lookup table; and

enabling first and second rows of routing information within the routing lookup table, the first row of routing information comprising the output virtual channel identifier and output port which will be assigned to the packet which will be routed to the destination of the mobile user's communication and the second row of routing information comprising the output virtual channel identifier and output port which will be assigned to incoming packets received at a second input port to be routed to the mobile user.

5,590,126
METHOD FOR CALL ESTABLISHMENT AND REROUTING IN MOBILE COMPUTING NETWORKS

Partho P. Mishra, Murray Hill, and Mani B. Srivastava, Chatham, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 27, 1995, Ser. No. 534,760
Int. Cl.[6] H04L *12/56;* **H04B** *7/26*
U.S. Cl. 370—329 **24 Claims**



1. A method of call establishment in a communications network, wherein mobile user devices are wirelessly coupled to said network via base station units corresponding to a predetermined cell boundary in said network, said network including a virtual circuit (VC) routing mechanism adapted to establish virtual circuit connections for transmission of data in said network, said method comprising the steps of:

establishing a VC connection path between a mobile device and another endpoint in said network, wherein said step of establishing said VC connection path includes the steps of:

sending a connection setup request from said mobile device to an associated base station to thereby initiate a communication to said endpoint; and

performing a handshake sequence between said mobile device and said associated base station, wherein said connection setup request is transmitted further in said network after completion of said handshake sequence, and wherein the VC establishment process is aborted if said mobile device moves out of the cell boundary of said associated base station prior to completion of said handshake sequence; and

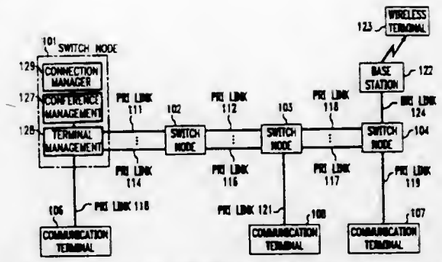
extending said VC path subsequent to said mobile device moving from a first cell boundary associated with a first base station to within a second cell boundary associated with a second base station, said first and second base station being coupled to a common local switching fabric.

5,590,127
MULTIMEDIA CONFERENCE CALL PROVIDING ADJUSTABLE BANDWIDTH FOR INDIVIDUAL COMMUNICATION TERMINALS

Bruce M. Bales, Louisville, and Stephen M. Thieler, Boulder, both of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 26, 1995, Ser. No. 452,484
Int. Cl.[6] H04L *12/18;* **H04M** *11/00;* **H04N** *7/15*
U.S. Cl. 370—260 **28 Claims**

1. A method for controlling a multimedia conference call between a plurality of telecommunication terminals interconnected by a switching system having a plurality of switch nodes and one



of the plurality of telecommunication terminals controlling the conference call, the method comprising the steps of:

implementing the conference call on first one of the plurality of switch nodes;

interconnecting each of the plurality of telecommunication terminals to the first one of the plurality of switch nodes by a communication path through the plurality of switch nodes where each communication path is through one or more of the plurality of switch nodes;

providing a plurality of communication types on the first one of the plurality of switch nodes;

managing the controlling one of the plurality of communication terminals by a terminal management application being executed by the first one of the plurality switch nodes;

receiving by the terminal management application all message transmitted to the controlling one of the plurality of communication terminals;

transmitting to the controlling one of the plurality of communication terminals by an individual one of the remaining ones of the plurality of communication terminals a first message to change the communication bandwidth varying the number of communication types on a first communication path used by the individual one of the remaining ones of the plurality of communication terminals; and

changing in response to the first message only the number of communication types that the individual one of the remaining ones of the plurality of communication terminals uses to participate in the multimedia conference call by the switch nodes throughout the first communication path and by the first one of the plurality of switch nodes.

5,590,128
DIAL LISTS FOR COMPUTER-BASED CONFERENCING SYSTEMS

Michael Maloney, Beaverton, and Robert Schlesinger, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 341,402, Nov. 16, 1994, Pat. No. 5,524,110, which is a continuation-in-part of Ser. No. 340,172, Nov. 15, 1994, which is a continuation-in-part of Ser. No. 157,694, Nov. 24, 1993, Pat. No. 5,506,954. This application Jun. 7, 1995, Ser. No. 476,450
Int. Cl.[6] H04L *12/18*
U.S. Cl. 370—260 **20 Claims**

1. A computer-implemented process for computer conferencing, comprising the steps of:

(a) displaying, to a user of a caller, a directory of possible callees for a computer conference call, wherein:

the user selects a callee from the directory of possible callees; and

the caller and the selected callee are nodes of a computer network; and

(b) initiating the computer conference call from the caller to the selected callee, wherein:

the directory of possible callees comprises a first subdirectory of possible callees and a second subdirectory of possible callees different from the first subdirectory; and

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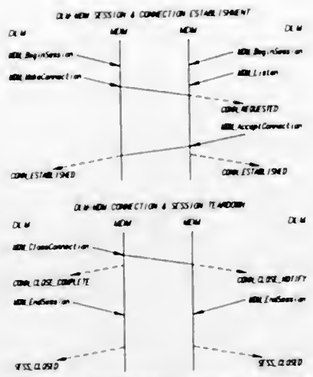


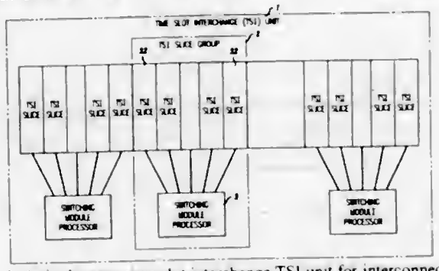
the directory is an alphabetized combination of the first and second subdirectories.

5,590,129

SINGLE STAGE TELECOMMUNICATIONS SWITCH WITH PARTITIONED PROCESSORS

Menachem T. Ardon, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 22, 1994, Ser. No. 361,414
Int. Cl.[6] H04Q *11/04*
U.S. Cl. 370—376 **16 Claims**



1. A single stage time slot interchange TSI unit for interconnecting a plurality of telecommunications transceiver comprising:

a plurality of TSI slices each for transmitting and receiving signals of a group of time slots, said plurality of TSI slices interconnected to form a single stage TSI switch for interconnecting all time slots of said plurality of TSI slices; and

A plurality of module processors, each for controlling a separate subset of said TSI slices;

Wherein a connection between a first telecommunications transceiver connected to a first TSI slice controlled by a first of said module processors and a second telecommunications transceiver connected to a second TSI slice controlled by a second of said module processors is established through cooperative actions by said first and said second module processors;

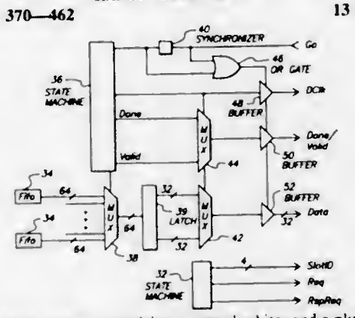
Wherein said first module processor transmits a message to said second module processor identifying a first time slot and said second module processor transmits a message to said first module processor identifying a second time slot and wherein a connection is established by having said first module processor control said first TSI slice to establish a connection between said first time slot and said second time slot and said second module processor controls said second TSI slice to establish a connection between said second time slot and said first time slot whereby a connection is established between time slots connectable to said first and said second telecommunication transceiver.

5,590,130

BUS PROTOCOL USING SEPARATE CLOCKS FOR ARBITRATION AND DATA TRANSFER

William T. Krein, San Jose; Charles M. Flaig, Cupertino, and James D. Kelly, Aptos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 186,380, Jan. 25, 1994, abandoned. This application Aug. 2, 1995, Ser. No. 510,557
Int. Cl.[6] H04L *12/417*
U.S. Cl. 370—462 **13 Claims**



1. In a bus system comprising a central arbiter and a plurality of nodes coupled to a bus, a data communication process comprising the steps of:

arbitrating among the plurality of nodes by the central arbiter synchronously with an arbitration clock signal to provide bus access to a first node of the plurality of nodes coupled to the bus;

transferring by the first node a data packet through the bus to a second node of the plurality of nodes coupled to the bus according to a data clock signal generated by the first node independently from the arbitration clock signal; and

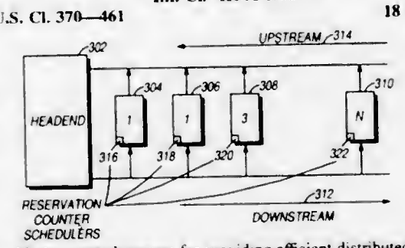
transferring by the first node to the second node a done signal according to the data clock signal.

5,590,131

EFFICIENT DISTRIBUTED QUEUEING RANDOM ACCESS METHOD FOR THE MEDIUM ACCESS CONTROL LAYER IN NETWORKS WITH BROADCAST CHANNELS

Mete Kabatepe, Norwood, Mass., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1995, Ser. No. 453,854
Int. Cl.[6] H04T *3/02*
U.S. Cl. 370—461 **18 Claims**



10. An network system for providing efficient distributed queueing random access for the medium access control layer in networks with broadcast channels, for conserving reservation bandwidth and concomitantly providing immediate transmission access, wherein, prior to receiving a first time slot, a plurality of reservation slot parameters are initialized by a user of a plurality of users, comprising:

A) a headend controller, responsive to a plurality of users, for controlling transmissions between the headend controller and the plurality of users; and

B) the plurality of users, responsive to the headend controller, for receiving and transmitting on predetermined broadcast channels, wherein each user includes a reservation counter scheduler, wherein each reservation counter scheduler operates to conserve reservation bandwidth and concomitantly provide immediate transmission access by:

C) receiving a time slot;

D) determining whether any reservation in a previous time slot was successful, and,

where a reservation has been successful, executing a predetermined reservation updating procedure to provide a user reservation position, and

where a reservation has been unsuccessful, updating reservation temporary value (RCtemp),

E) determining whether at least one of the feedbacks indicates failure of reservation, and where feedbacks fail to indicate failure of reservation, proceeding to step G;

F) performing, where at least one of the feedbacks indicates failure of reservation, predetermined reserved pointer adjustments;

G) determining transmission probability for the user;

H) determining whether the user is eligible to transmit, and where eligible, whether the user has a data segment for transmission; and

where one of:

the user is ineligible to transmit, and

the user is eligible to transmit and the user fails to have data segments for transmission,

proceeding to step IIH:

I) executing, where user's reservation position is in the current time slot, a reservation-transmission procedure, and where the user's reservation position fails to be in the current time slot, proceeding to step J; and

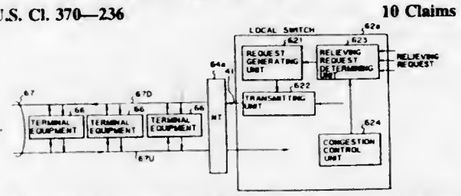
J) executing a predetermined distributed global queue temporary value (DQtemp) procedure for reserving, where needed, a minislot in an upcoming frame.

5,590,132

CONGESTION RELIEVING SYSTEM IN A COMMUNICATION SYSTEM

Ryoichi Ishibashi, and Katsumi Sekine, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 831,794, Feb. 5, 1992, Pat. No. 5,341,373. This application Mar. 22, 1994, Ser. No. 216,049
Claims priority, application Japan, Feb. 5, 1991, 3-035519; Feb. 5, 1991, 3-035520
Int. Cl.[6] H04J *3/02;* **H04L** *12/40*
U.S. Cl. 370—236 **10 Claims**



9. A method for transmitting a first cell having a request bit from a local switch to a customer station by way of a down-signal bus and for receiving a second cell from the customer station by way of an up-signal bus, comprising the steps of:

generating a cell restriction signal when the customer station is to be restricted from sending the second cell;

inserting the cell restriction signal as the request bit in the first cell;

transmitting the first cell to the customer station;

monitoring the request bit to control sending the second cell onto the up-signal bus; and

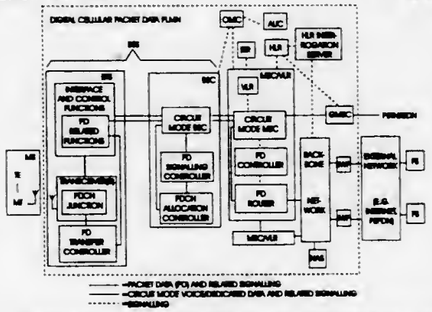
inserting the request bit into the first cell to indicate that the customer station possesses data to be sent on the second cell.

5,590,133

APPARATUSES AND MOBILE STATIONS FOR PROVIDING PACKET DATA COMMUNICATION IN DIGITAL TDMA CELLULAR SYSTEMS

Lars Billström, Sonla; Lars Wetterborg; Steinar Dahlin, both of Järfälla, and Bengt Persson, Djursholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 9, 1994, Ser. No. 354,874
Claims priority, application Sweden, Dec. 10, 1993, 9304119
Int. Cl.[6] H04T *3/26;* **H04Q** *7/38*
U.S. Cl. 370—349 **57 Claims**



1. An apparatus for providing packet data communication to and from mobile stations in a digital TDMA cellular system having a plurality of base stations providing regular cellular control channels and regular cellular dedicated traffic channels; one or more mobile services switching centers, each being associated with a visitor location register and being coupled to a subordinated plurality of the base stations; and home location register means for storing information on mobile station subscribers, the apparatus comprising:

channel providing means for providing, in at least some of the base stations, on a per cell basis, one or more shared packet data channels for packet transfer to and from the mobile stations, and packet transfer controlling means for controlling the packet transfer;

channel defining means for defining, on a per cell basis, the packet data channel to be used for packet transfer;

first packet data mode establishing means for establishing packet data mode for a mobile station to enable the mobile station to send and receive packets over the packet data channels;

first packet transferring means for transferring packets between the mobile stations and base stations;

second packet transferring means for transferring packets between the base stations and their respective superior mobile services switching centers;

packet routing means for routing packets to and from a service area of a mobile services switching center;

first means for performing cell selection for a mobile station in packet data mode;

first means for performing location updating for the mobile station in packet data mode;

first packet data mode maintaining means for maintaining the packet data mode for a roaming mobile station; and

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first packet data mode terminating means for terminating the established packet data mode for the mobile station.

5,590,134

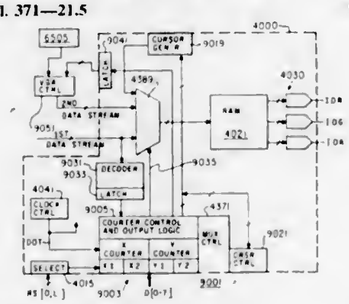
TEST CIRCUITS AND METHOD FOR INTEGRATED CIRCUIT HAVING MEMORY AND NON-MEMORY CIRCUITS BY ACCUMULATING BITS OF A PARTICULAR LOGIC STATE

Chenwei J. Yin, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 934,598, Aug. 24, 1992, which is a division of Ser. No. 544,771, Jun. 27, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 477,213

Int. Cl.[6] **G11C** *29/00*

U.S. Cl. 371—21.5 **9 Claims**



3. An integrated circuit comprising:

a plurality of connection pins including input pins and output pins;

a read/write memory connected to a first subset of said input pins having a plurality of addressable storage locations each for storing a data word including a plurality of data bits therein, said read/write memory responsive to an address received on said first subset of input pins for recall of said data word stored at one of said addressable storage locations corresponding to said received address;

a non-memory circuit connected to said read/write memory to receive said data word recalled from said read/write memory, said non-memory circuit producing an output on a first subset of said output pins corresponding to said data word recalled from said memory;

a selector circuit connected to said read/write memory to receive said data word recalled from said read/write memory and connected to a second subset of said input pins, said selector circuit outputting a selected subset of said plurality of data bits of said data word recalled from said read/write memory, said subset selected corresponding to data received at said second subset of input pins; and

an accumulator connected to said selector circuit to receive said selected subset of said plurality of data bits of said data word recalled from said read/write memory, said accumulator including:

a detector for detecting the number of bits within said selected subset of said plurality of data bits of said data word recalled from said read/write memory having a predetermined logic state, said detector forming a count of said detected number of bits,

an adder for accumulating said count of said detected number of bits for each data word recalled from said read/write memory over a period of time, and

a count register storing therein said count, said count register producing an output on a second subset of said output pins corresponding to said count.

5,590,135

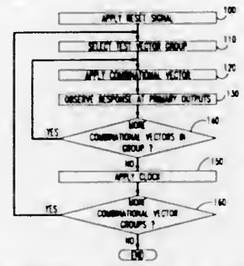
TESTING A SEQUENTIAL CIRCUIT

Miron Abramovici, Naperville, Ill.; Vishwani D. Agrawal, New Providence; Kwang-Ting Cheng, Edison, both of N.J., and Krishna B. Rajan, Chicago, Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 20, 1991, Ser. No. 795,404

Int. Cl.[6] **H04B** *17/00*

U.S. Cl. 371—22.1 **1 Claim**



1. A method for testing a sequential circuit having signal inputs and a clock input, the clock input being the input where application of a pulse causes a change in values of memory elements in the circuit, when input conditions call for a change in said values, said method comprising the steps of:

obtaining from a memory a test vector comprising bits dedicated to said signal inputs, those being data bits, and a bit dedicated to said clock input, that being the clock bit;

applying the test vector to said circuit by applying the data bits to the signal inputs and applying the clock bit to the clock input;

observing output signal of said circuit, and returning to said step of obtaining;

wherein

the test vectors stored in said memory either have the clock bit active or some of the data bits active, but not both, and there are at least two vectors consecutively obtained from the memory where the data bits are active.

5,590,136

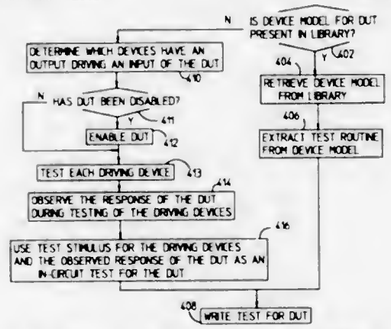
METHOD FOR CREATING AN IN-CIRCUIT TEST FOR AN ELECTRONIC DEVICE

Kamran Firooz, Loveland, Colo., assignor to Hewlett-Packard CO, Palo Alto, Calif.

Filed Jan. 25, 1995, Ser. No. 378,224

Int. Cl.[6] **G01R** *31/28*

U.S. Cl. 371—25.1 **6 Claims**



1. In an automated test equipment system for testing a circuit board containing a plurality of interconnected digital devices, a method for generating an in-circuit test for a device under test, the method comprising the steps of:

(a) determining, from electrical interconnect data for the devices on the circuit board, each device that has an output driving an input of the device under test;

(b) conducting an in-circuit test for each of said driving devices using test stimuli;

(c) observing a first response of said device under test during said in-circuit test of said driving devices; and

(d) using said test stimuli used for said driving devices and said first observed response of said device under test as an in-circuit test for said device under test.

5,590,137

SEMICONDUCTOR IC TESTER

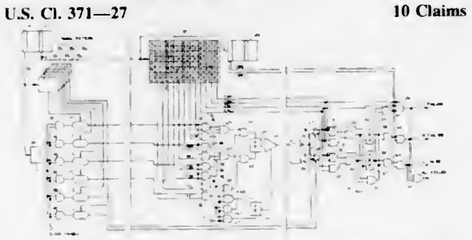
Kazuhiro Yamashita, Kazo, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Oct. 13, 1994, Ser. No. 322,270

Claims priority, application Japan, Oct. 13, 1993, 5-255532

Int. Cl.[6] **G01R** *31/28*

U.S. Cl. 371—27 **10 Claims**



1. A semiconductor IC tester for testing an IC device by applying a test signal to the IC device and comparing a resulted output signal from the IC device with expected data for each test cycle, comprising:

a pattern generator to generate pattern data to form said test signal and said expected data, timings of said test signal being formed based on a first group of clock signals and a second group of clock signals;

a driver to directly supply said test signal to an IC device under test as a driver output signal when receiving said test signal as a driver input signal;

a first flip-flop to provide said driver input signal to said driver based on the timings determined by said first group of clock signals;

a second flip-flop to set an enable state or a disable state of said driver based on the timings determined by said second group of clock signals;

a comparator to compare an output signal from said IC device under test with a threshold voltage level;

a selector circuit to selectively transfer output signals from said comparator to compare with said expected data at a rate two times higher than said test cycle when said IC tester is in a double-speed mode; and

a double-speed switching circuit to supply said second group of clock signals to said first flip-flop so that said test signal is generated at a rate two times higher than said test cycle while controlling said second flip-flop to maintain said driver in said enable state when said IC tester is set in said double-speed mode.

5,590,138

ERROR CORRECTION APPARATUS

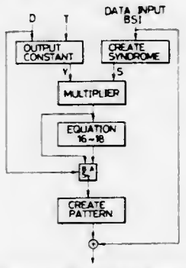
Keiichi Iwamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 90,549, Jul. 13, 1993, abandoned, which is a division of Ser. No. 885,248, May 20, 1992, abandoned, which is a continuation of Ser. No. 515,682, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 102,583, Sep. 28, 1987, abandoned. This application Mar. 7, 1995, Ser. No. 400,521

Claims priority, application Japan, Sep. 30, 1986, 61-232001; Sep. 30, 1986, 61-232003; Sep. 30, 1986, 61-232004; Sep. 30, 1986, 61-232005; Sep. 30, 1986, 61-232006; Sep. 30, 1986, 61-232007; Sep. 30, 1986, 61-232008

Int. Cl.[6] **H03M** *13/00*

U.S. Cl. 371—37.1 **12 Claims**



1. An encoding and decoding apparatus comprising:

syndrome generating means for generating a syndrome from input data;

constant output means for outputting a constant for encoding and outputting a constant for adjusting code length in decoding:

multiplication means for multiplying the constant output from said constant output means with the syndrome generated by said syndrome generating means;

calculation means for calculating an error location from a result of multiplication by said multiplication means;

selection means for selecting an output of said multiplication means in encoding and selecting an output of said calculation means in decoding;

pattern generation means for generating a parity in encoding and generating an error pattern in decoding, on the basis of the output selected by said selection means; and

summation means for adding the parity to the input data in encoding and correcting an error in the input data by obtaining a logical sum of an output from said pattern generation means and the input data in decoding.

5,590,139

METHOD OF RECORDING A COMPRESSED MOTION PICTURE SIGNAL IN WHICH EFFECTS OF ROUNDING ERRORS RESULTING FROM INVERSELY TRANSFORMING TRANSACTION COEFFICIENTS REPRESENTING ARE MITIGATED

Teruhiko Suzuki, Chiba; Yoichi Yagasaki, Tokyo; Tatsuya Sudo, Kanagawa, and Toru Okazaki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 202,783, Feb. 28, 1994, Pat. No. 5,481,553. This application May 30, 1995, Ser. No. 453,023

Claims priority, application Japan, Mar. 1, 1993, 5-040203; Mar. 19, 1993, 5-059909

Int. Cl.[6] **H04N** *5/917;7/30*

U.S. Cl. 371—49.1 **11 Claims**

1. A method of recording, in a recording medium, a motion picture signal comprising plural pictures and representing a motion picture, the motion picture signal being subject to compression processing prior to recording, the method mitigating rounding errors in the compression processing, and including steps of:

dividing each picture of the motion picture signal into blocks;

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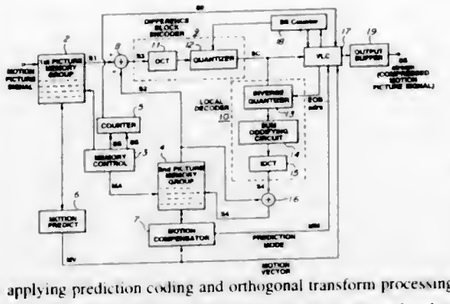


applying prediction coding and orthogonal transform processing to the blocks of each picture of the motion picture signal to provide respective blocks of transform coefficient;

sum oddifying the blocks of transform coefficients to generate respective sum-oddified blocks of transform coefficients;

applying inverse orthogonal transform processing and prediction decoding to the sum-oddified blocks of transform coefficients to provide respective blocks of a reconstructed picture for use as a reference picture in prediction coding other pictures of the motion picture signal;

deriving a compressed recording signal from the blocks of transform coefficients; and

recording the compressed recording signal in the recording medium.

5,590,140

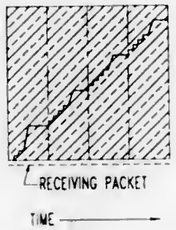
CLOCK RECOVERY EXTRAPOLATION

Ernest E. Bergmann, Fountain Hill, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 30, 1994, Ser. No. 367,382

Int. Cl.[6] H04L *7/00*

U.S. Cl. 371—61 **4 Claims**



1. A method of data recovery for data packets transmitted within specified time intervals comprising the steps of:

determining clock corrections while data is being received during one interval; and

extrapolating said corrections to the next interval.

5,590,141

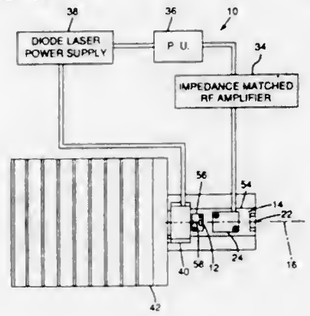
METHOD AND APPARATUS FOR GENERATING AND EMPLOYING A HIGH DENSITY OF EXCITED IONS IN A LASANT

Brian Baird, Oregon City; Richard DeFreez, Hillsboro, and Yunlong Sun, Portland, all of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 873,449, Apr. 24, 1992, Pat. No. 5,323,414, and Ser. No. 251,475, May 31, 1994, Pat. No. 5,559,824, which is a continuation-in-part of Ser. No. 873,408, Apr. 24, 1992, Pat. No. 5,317,447. This application Jun. 20, 1994, Ser. No. 262,919

Int. Cl.[6] H01S *3/091*

U.S. Cl. 372—10 **24 Claims**



1. A method for pumping a lasant including a mode volume having an absorption coefficient, a length along an optic axis, and active ions that are excitable to a metastable excitation state in which excited ions have an effective fluorescence lifetime, the method comprising:

generating a pumping beam having a high degree of lateral and spatial coherence at a pumping rate ω_p;

optically pumping with the pumping beam a nonstoichiometric lasant in which the mode volume has an active ion concentration of greater than 1%;

concurrently exciting greater than 1% of the active ions in the mode volume to the metastable excitation state, in which a solitary ion has a fluorescence lifetime τ_r, to induce concentration-dependent depopulation mechanisms corresponding to a parameter B in addition to spontaneous and stimulated emission from the metastable excitation state, such that the inverse of a parameter "a" represents an effective fluorescence lifetime of excited active ions in the metastable excitation state, where parameter "a" is generally expressed as

$$a=(1/\tau_r+\omega_p+B),$$

thereby reducing the effective fluorescence lifetime of excited active ions in the metastable excitation state; and

employing a O-switch to generate from the lasant substantially high peak power pulses having comparable magnitudes over a wide range of pulse repetition frequencies (PRFs) such that a dependence of energy per pulse on a PRF is generally expressed as $E_1=E_0(1-e^{-at})$, wherein E_0 represents the energy per pulse at a PRF that is less than 10 Hz and E_1 represents the energy per pulse at a PRF given by the inverse of an interpulse period t.

5,590,142

MODE-LOCKED FIBRE RING LASER STABILIZATION

Xuekang Shan, Ipswich, England, assignor to British Telecommunications public limited company, London, England

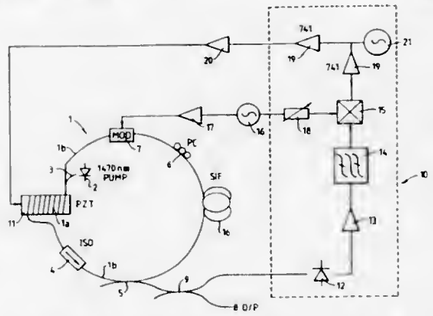
PCT No. PCT/GB94/00355, § 371 Date Mar. 14, 1995, § 102(e) Date Mar. 14, 1995, PCT Pub. No. WO94/19847, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 23, 1994, Ser. No. 403,717

Claims priority, application European Pat. Off., Feb. 25, 1993, 93301413

Int. Cl.[6] H01S *3/098*

U.S. Cl. 372—18 **16 Claims**



1. A method of stabilizing the output of a mode-locked fibre ring laser including a dopant in its core, the method comprising the steps of:

adjusting the length of the ring laser to minimize variations in its cavity length, and hence phase-lock laser output pulses with that of a drive source, and

subjecting a portion of the fibre of the ring laser to vibrations at a predetermined frequency whose period is less than the dopant ion upper state lifetime.

5,590,143

MULTIPLE-FREQUENCY-MODULATION TYPE MODE-LOCKED LASER DEVICE

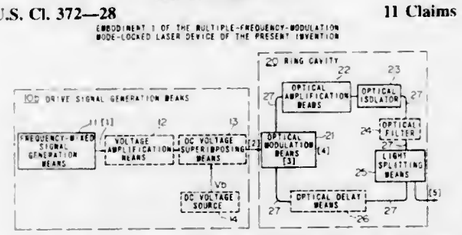
Hidehiko Takara, Yokosuka; Satoki Kawanishi, Zushi, and Masatoshi Saruwatari, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 2, 1995, Ser. No. 398,177

Claims priority, application Japan, Mar. 3, 1994, 6-033735

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—28 **11 Claims**



1. A multiple-frequency-modulation type mode-locked laser device comprising:

an optical cavity, which includes

an optical modulation means for receiving an optical pulse and a driving signal, modulating said optical pulse in response to said driving signal, and outputting a modulated optical pulse;

an optical amplification means for amplifying said modulated optical pulse;

an optical splitting means for outputting a split optical pulse from said optical cavity; and

an optical coupling means for optically coupling said optical modulation means, said optical amplification means, and said optical splitting means to form said optical cavity, in order; and

a driving signal generation means for generating said driving signal as a frequency-mixed driving signal mixed from at least two different frequencies which are integral multiples of a frequency spacing f_r of a longitudinal mode of said optical cavity, wherein $f_r=c/R$, c is the velocity of light, and R is an optical path length of said optical cavity.

5,590,144

SEMICONDUCTOR LASER DEVICE

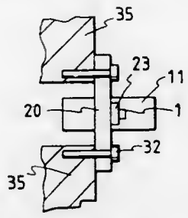
Shoji Kitamura; Yolchi Shindo, and Akira Amano, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 43,482, Apr. 6, 1993, Pat. No. 5,444,726, which is a continuation-in-part of Ser. No. 788,601, Nov. 6, 1991, Pat. No. 5,355,385. This application Aug. 12, 1994, Ser. No. 289,573

Claims priority, application Japan, Nov. 7, 1990, 2-302258; Apr. 1, 1992, 4-85323; Jan. 22, 1993, 5-8679; Mar. 30, 1993, 5-70597

Int. Cl.[6] H01S *3/04;* **H01L** *23/48*

U.S. Cl. 372—36 **9 Claims**



1. In a semiconductor laser device having a lead frame for electrically controlling a laser diode element having at least one end face for emitting a laser beam and for mechanically supporting the laser diode element on a planar major surface thereof with a support member interposed therebetween, a sealing resin layer allowing the laser beam to pass therethrough and covering at least the laser diode element on the lead frame in a sealing manner, a portion of the lead frame, devoid of the sealing resin layer, being placed against an external fixing board, and means for fixing the lead frame to the external fixing board.

5,590,145

LIGHT-EMITTING APPARATUS CAPABLE OF SELECTING POLARIZATION DIRECTION, OPTICAL COMMUNICATION SYSTEM, AND POLARIZATION MODULATION CONTROL METHOD

Jun Nitta, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 392,212

Claims priority, application Japan, Feb. 23, 1994, 6-051206; Dec. 12, 1994, 6-332106

Int. Cl.[6] H01S *3/18*

U.S. Cl. 372—50 **21 Claims**

1. A light-emitting apparatus comprising:

light-emitting means capable of selectively changing a direction of a polarization plane of output light to one of two orthogonal directions by controlling an excited state; and

optical amplifying means for amplifying the output light from said light-emitting means, said optical amplifying means having different amplification factors with respect to polarized light components in the two orthogonal directions; and

control means for detecting a change in a voltage between terminals of said optical amplifying means and controlling

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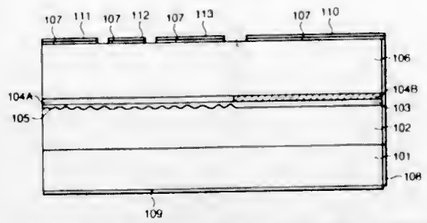
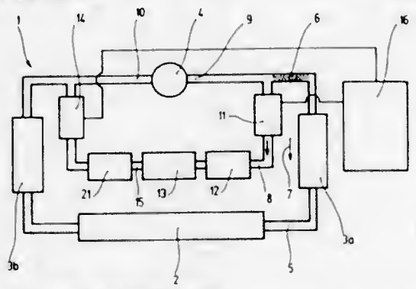


operation of said light-emitting means based on detection signal so that said light emitting means selectively changes the direction of the polarization plane of output light to one of the two orthogonal directions.

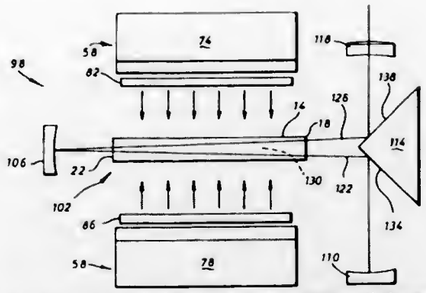
5,590,146
GAS LASER
Michael von Borstel, Stuttgart, Germany, assignor to Trumpf Lasertechnik GmbH, Ditzingen, Germany
Filed May 19, 1995, Ser. No. 444,782
Claims priority, application Germany, May 19, 1994, 44 17 468.3
Int. Cl.[6] H01S *3/22;3/223*
U.S. Cl. 372—58 **25 Claims**



1. A gas laser assembly having
(a) a laser-gas circulation path (5) including a fan (4) which moves the laser gas (6) through the laser discharge space (2) and a cooling system (3a, 3b);
(b) a bypass (8) connected to said path on opposite sides of said fan through which a part (15) of the laser gas (6) is moved by the fan (4) to bypass the laser discharge space (2); and
(c) means for opening and for blocking said bypass (8) so that it can be turned off and on.

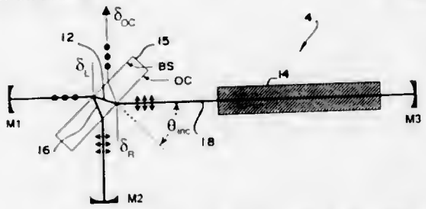
5,590,147
SIDE-PUMPED LASERS
John W. Hobbs, Somerset, and Laurence E. Cramer, Flemington, both of N.J., assignors to The Morgan Curcible Company plc, Windsor, United Kingdom
Filed Dec. 19, 1994, Ser. No. 359,074
Int. Cl.[6] H01S *3/091;3/094*
U.S. Cl. 372—75 **16 Claims**

1. A solid-state laser comprising:
a. a material having opposed first and second sides and first and second ends and adapted to emit lasing radiation, wherein the first and second sides of the material are convex, the material having an oblong shape;
b. first and second means spaced along the first and second sides of the material, respectively, for pumping the material by emitting pumping radiation, wherein each of the pumping means spaced along the first and second sides of the material comprises a 1×N array of diodes, where N is an integer greater than one;



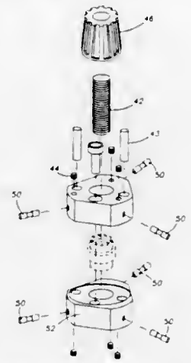
c. a lens having a cylindrical shape interposed optically between the first pumping means and the first side of the material, for at least partially collimating the emitted pump radiation; and
d. means for redirecting the emitted lasing radiation through the material along at least four paths extending from the first end of the material to the second end, wherein the redirecting means comprises a prism having adjoining first and second faces, at least one of the four paths extending to the first face and another of the four paths extending to the second face, and a truncated prism having a plurality of reflective faces, each of the four paths extending to at least one of which reflective faces.

5,590,148
BIREFRINGENT BEAMSPLITTER FOR HIGH POWER LASERS AND LASER APPLICATIONS
Eric B. Szarmes, Durham, N.C., assignor to Duke University, Durham, N.C.
Filed Aug. 24, 1994, Ser. No. 295,169
Int. Cl.[6] H01S *3/08*
U.S. Cl. 372—105 **27 Claims**



1. In a high intensity laser of the type having three reflective surfaces and beam splitting means for producing a plurality of optical paths using a lasing medium having opposite ends and located between two of said reflective surfaces with the beam splitting means being located between one of the reflective surfaces and one of said ends of the lasing medium, said beam splitting means comprising a birefringent crystal having at least two substantially parallel surfaces, a first one of said optical paths passing between said two reflective surfaces and through said lasing medium, said two parallel surfaces of said crystal intercepting said first one of said optical paths at an angle of interception sufficiently close to Brewster's angle such that another of said optical paths is created from a first one of said two parallel surfaces with a beam having a polarization of one type and a further one of said optical paths is created from the second one of said two parallel surfaces with a beam having a polarization that is different from that of said one type, said further one of said optical paths including said third of said reflective surfaces.

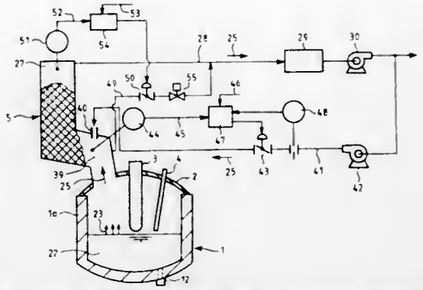
5,590,149
MIRROR MOUNT
Dennis Reeder, South Jordan, Utah, assignor to Spectra-Physics Lasers, Inc., Mountain View, Calif.
Filed Sep. 13, 1995, Ser. No. 527,564
Int. Cl.[6] H01S *3/08*
U.S. Cl. 372—107 **16 Claims**



1. A minor mount assembly, comprising:
a base plate positioned at one end of a laser resonator;
a movable plate spaced from and positioned substantially parallel to the base plate; and
one or more elastic springs connected between the base plate and the moveable plate to provide tip and tilt of the movable plate away from or towards the base plate, each elastic spring including a bushing made of an elastic material capable of elastic expansion and contraction, the bushing including a threaded interior side, a longitudinal axis and at least three elastic dimples formed in the bushing circumferentially in a plane across the bushing longitudinal axis and extend into the bushing threaded interior side to flexibly contact one or more threads of a screw received in the bushing threaded interior side, wherein the dimples are dimensioned to be smaller than a screw thread and configured to permit rotation of the bushing and screw relative to each other to advance and retract the screw along the longitudinal axis and provide a selected adjustment of the screw along the bushing's longitudinal axis with reduced mechanical hysteresis of the screw.

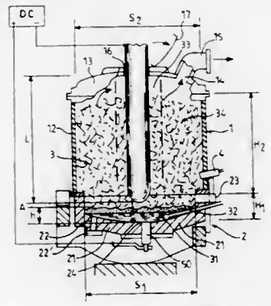
5,590,150
ELECTRIC ARC MELTING FURNACE
Masaki Ogushi, Yokohama; Osamu Takeuchi, Mitaka; Ikuo Yamamura, Tokyo; Toru Iura, Fujisawa, and Hironobu Yoshida, Urayasu, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisba, Tokyo, Japan
PCT No. PCT/JP94/00619, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO95/09336, PCT Pub. Date Apr. 6, 1994
PCT Filed Apr. 14, 1994, Ser. No. 338,545
Claims priority, application Japan, Sep. 30, 1993, 5-244839; Dec. 22, 1993, 5-324158
Int. Cl.[6] F27D *17/00*
U.S. Cl. 373—9 **4 Claims**

1. An electric arc melting furnace comprising:
a furnace shell with an electrode for melting scrap by heat of arc;
an air blasting port for blasting air oxygen or oxygen-enriched air to an upper space in said furnace shell through an air control valve;
a carbon blasted quantity indicator for measuring quantity of carbon to be charged into said furnace shell;
a scrap charged quantity indicator for measuring quantity of the scrap charged into said furnace shell;



an oxygen blasted quantity indicator for measuring quantity of oxygen blasted into said furnace shell; and
arithmetic processor for computing quantity of air required for complete combustion of carbon monoxide quantity of which is determined by calculation on chemical reaction from the quantity of carbon in the scrap measured by said scrap charged quantity indicator, from the quantity of carbon measured by said carbon blasted quantity indicator and from the quantity of oxygen measured by said oxygen blasted quantity indicator to control a degree of opening of said air control valve.

5,590,151
PROCESS FOR MELTING SCRAP IRON IN AN ELECTRIC FURNACE AND INSTALLATION FOR IMPLEMENTING THE PROCESS
Guy Forestier, Saint-Just-Saint-Rambert, France, assignor to Clecim, Cergy-Pontoise, France
PCT No. PCT/FR94/00523, § 371 Date Jun. 12, 1995, § 102(e) Date Jun. 12, 1995, PCT Pub. No. WO94/26938, PCT Pub. Date Nov. 24, 1994
PCT Filed May 5, 1994, Ser. No. 374,514
Claims priority, application France, May 13, 1993, 93 05785
Int. Cl.[6] F27D *1/00*
U.S. Cl. 373—72 **7 Claims**



2. Direct current electric furnace for melting a ferrous raw material and producing a predetermined quantity of molten metal at each casting, said furnace comprising:
(a) a vessel having an axis and comprising a bottom constituting a hearth lined with refractory material and having a form of a basin with a raised upper edge, and a cooled substantially cylindrical lateral wall having a bottom connecting to said upper edge of said basin and an upper part which is closed by a detachable cover for introducing a charge of raw material to be melted;
(b) at least one consumable electrode which is mounted to slide substantially along said axis of said vessel so as to descend vertically into an interior of said vessel by passing through at least one opening provided in said cover and provided with a removable shutter;

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(c) at least one stationary electrode positioned in said hearth;

(d) at least one source of direct current having two poles connected, respectively, to said at least one consumable and stationary electrodes, said at least one consumable electrode gradually descending in said vessel for melting said raw material and forming a bath of molten metal which collects in said basin up to a level, said bath being covered by a layer of dross;

(e) said basin having a first opening for pouring said molten metal and a second opening for removing said dross, said basin having a height and a maximum cross-section defining a capacity corresponding to said predetermined quantity of molten metal;

(f) wherein said lateral wall has a cross-section which is substantially equal to said maximum cross-section of said basin and a height which is so selected that a volume defined by said lateral wall is between six and twelve times said capacity of said basin for allowing said vessel to contain a charge of raw material sufficient to produce, in a single melting operation, said predetermined quantity of molten metal;

(g) said vessel being associated with additional heating means for introducing hot gases at said bottom of said lateral wall, said hot gases rising at least through an annular region of a charge of said raw material along said lateral wall and escaping through an outlet opening in said cover.

5,590,152

DC ARC FURNACE

Shinobu Nakajima, Matsudo, and Kunji Maebou, Kasukabe, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

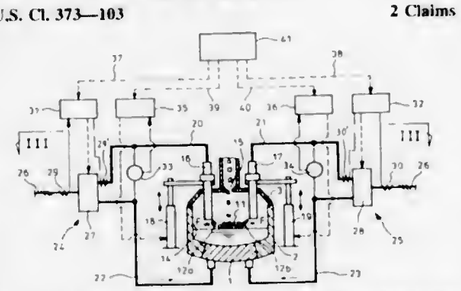
PCT No. PCT/JP94/00616, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO94/24504, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 14, 1994, Ser. No. 331,555

Claims priority, application Japan, Apr. 15, 1993, 5-088802

Int. Cl.[6] H05B *7/11*

U.S. Cl. 373—103 **2 Claims**



1. A DC arc furnace characterized by comprising a furnace shell with a lower electrode at a bottom thereof, a furnace roof adapted to close an upper portion of said furnace shell, two upper electrodes horizontally spaced apart from each other with a predetermined distance and vertically extending through said furnace roof, lifting devices for vertically moving the upper electrodes independently from each other, upper conductors each connected to the corresponding upper electrode and extending in the direction away from the remainder of the upper electrodes, two lower conductors connected to said lower electrode and each extending in a direction along which the corresponding upper conductor extends and power source circuits each arranged between extension ends of the corresponding upper and lower conductors.

5,590,153

DIGITAL MODEM FOR REDUCING INTERFERENCE IN THE SAME CHANNEL OF ANOTHER SYSTEM

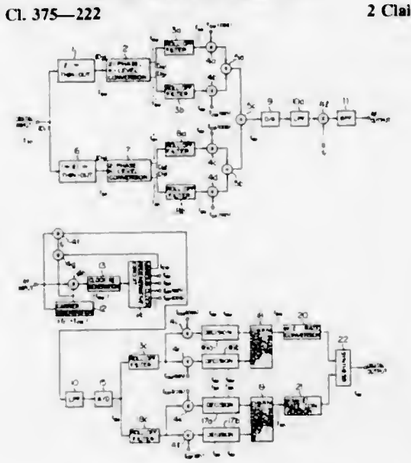
Yutaka Tanaka, and Minoru Honda, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Continuation of Ser. No. 913,449, Jul. 15, 1992, abandoned. This application Jul. 18, 1994, Ser. No. 277,413

Claims priority, application Japan, Jul. 17, 1991, 3-201172

Int. Cl.[6] H04B *1/38;* **H04L** *5/16*

U.S. Cl. 375—222 **2 Claims**



1. A digital modem comprising:

digital thin-out means for dividing an input binary code string, every period of m digits, into at least a first series of l digits binary code string and a second series of (m- 1) digits binary code string and for converting said first series binary code at l:m clock rate and said second series binary code at (m-1):m clock rate to form first and second continuous binary code strings, l being unequal to (m-1);

means for generating first and second intermediate carriers;

first and second digital modulators, each modulating, respectively, said first and second intermediate carriers with said first and second continuous binary code strings respectively, said first digital modulator generating a first modulated carrier which is transmitted in a higher frequency band between video and voice carriers in one channel of a conventional television broadcasting system, and said second digital modulator generating a second modulated carrier which is transmitted in a lower frequency band below said video carrier in said one channel of the conventional television broadcasting system to use an idle channel of the conventional system in one area, said channel being the same as one channel of the conventional system used in another area adjacent to said one area, to reduce radio interference therebetween;

first and second demodulators, each demodulating, respectively, said first and second modulated carriers to reproduce said first and second continuous binary code strings;

first and second clock rate conversion means, each converting, respectively, a clock rate of said reproduced first and second continuous binary code strings into said first series of l digits binary code string and said second series of (m-1) digits binary code string respectively; and

digital synthesis means for synthesizing said first series of l digits binary code string and said second series of (m-1) digits binary code string to produce said input binary code string.

5,590,154

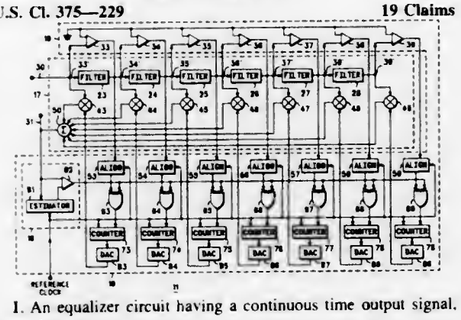
EQUALIZER CIRCUIT AND A METHOD FOR EQUALIZING A CONTINUOUS SIGNAL

William R. Forni, Chandler, and Scott A. Kaylor, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1995, Ser. No. 494,424

Int. Cl.[6] H03D *3/22*

U.S. Cl. 375—229 **19 Claims**



1. An equalizer circuit having a continuous time output signal, comprising:

a finite impulse response filter having a plurality of successive delay nodes coupled for providing a set of delayed signal data and a set of delayed signs of the corresponding set of delayed signal data from a continuous time input signal and having a plurality of multiplier circuits coupled for multiplying the set of delayed signal data with a corresponding set of tap weights, wherein the plurality of successive delay nodes includes a filter circuit having an input terminal and an output terminal and a signum generating circuit having a plurality of input terminals and an output terminal, and each multiplier circuit of the plurality of multiplier circuits has a plurality of input terminals and an output terminal, the input terminal of the filter circuit coupled to a first input terminal of the signum generating circuit and to a first input terminal of a first multiplier circuit of the plurality of multiplier circuits, a second input terminal of the signum generating circuit coupled to receive a reference signal, and the output terminal of the signum generating circuit coupled to the tap weight generation circuit; and

a tap weight generation circuit coupled for providing the set of tap weights.

5,590,155

EQUIPMENT FOR GENERATING A TRANSMIT SIGNAL FROM FIRST AND SECOND DIGITAL SIGNALS

Akira Yasuda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 143,064, Oct. 29, 1993. This application Jun. 5, 1995, Ser. No. 461,972

Claims priority, application Japan, Oct. 30, 1992, 4-292306; Jun. 9, 1994, 6-127770

Int. Cl.[6] H04L *5/12;23/02*

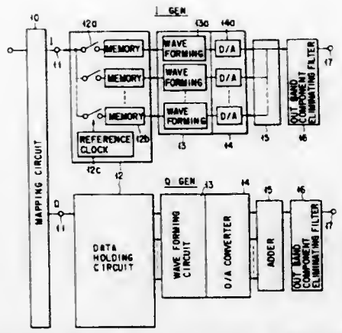
U.S. Cl. 375—261 **16 Claims**

1. A transmitting equipment comprising:

signal conversion means for converting a time-series input signal into first and second time-series digital signals;

signal holding means for dividing the first and second time-series digital signals from said signal conversion means into a plurality of first and second digital signals each consisting of a plurality of bits, holding the plurality of first and second digital signals, and outputting the plurality of first and second digital signals in parallel;

waveform forming means for outputting a plurality of first and second waveform data items respectively corresponding to the plurality of first and second digital signals output from said signal holding means;



D/A conversion means for converting the plurality of first and second waveform forming data items output from said waveform forming means into a plurality of first and second analog signals, respectively;

addition means for adding the plurality of first and second analog signals from said D/A conversion means and outputting first and second sum signals corresponding to the addition of the plurality of first analog signals and the addition of the plurality of second analog signals, respectively;

filter means for removing high-frequency components from the first and second sum signals output from said addition means;

orthogonal modulation means for orthogonally modulating the first and second sum signals, respectively, to output first and second orthogonal modulated signals; and

transmitting signal generation means for adding the first and second orthogonal modulated signals from said orthogonal modulation means and generating a corresponding transmission signal.

5,590,156

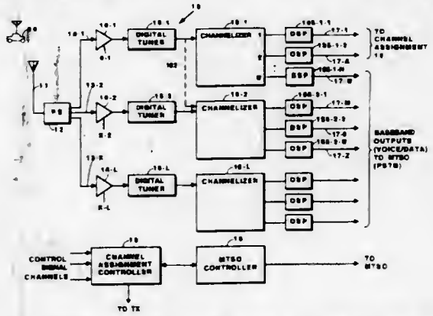
MULTICHANNEL WIDEBAND DIGITAL RECEIVER MAKING USE OF MULTIPLE WIDEBAND TUNERS HAVING INDIVIDUALLY SELECTABLE GAINS TO EXTEND OVERALL SYSTEM DYNAMIC RANGE

Ronald Carney, 916 Flower St., NW., Palm Bay, Fla. 32907

Filed Apr. 22, 1994, Ser. No. 231,262

Int. Cl.[6] H03K *9/00;* **H04B** *1/06;* **H04Q** *11/00*

U.S. Cl. 375—316 **25 Claims**



1. A basestation for processing signals in a multiple subscriber unit wireless communication system comprising:

an antenna for receiving signals from a plurality of the subscriber units;

a power splitter, connected to the antenna, to provide a plurality of power splitter output signals;

a plurality of gain control means, each one of the gain control means being connected to receive a respective one of the power splitter output signals, and each gain control means

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having a separately adjustable gain control input, and each gain control means providing a wideband signal;

a plurality of wideband tuner sections, with each tuner section being connected to receive one of the wideband signals, and with each wideband tuner section operating over a respectively different frequency bandwidth, and each wideband tuner section being connected to provide a wideband tuner output signal;

a plurality of channelization means, each channelization means being connected to receive a respective one of the wideband tuner output signals, and with each channelization means providing multiple channel signal outputs, each channel signal output having a predetermined channel bandwidth; and

channel assignment means, including:

(i) access control signal receiving means, for receiving an access control signal requesting access to a radio frequency channel by a selected one of the subscriber units, and for determining a received signal strength indication, RSSI, of that access control signal;

(ii) means for generating a frequency control signal designating a selected transmit frequency, and for receiving the RSSI of the access control signal, the selected transmit frequency being selected from within a first frequency bandwidth over which a first one of the plurality of wideband tuner sections operates if the RSSI is above a minimum threshold and within a first range of signal strengths associate with the first wideband tuner section, and the transmit frequency being selected within a second frequency bandwidth over which a second one of the plurality of wideband tuner sections operates if the RSSI is above the minimum threshold and within a second range of signals strengths associated with the second wideband tuner section; and

(iii) frequency assignment means for receiving the frequency control signal and for assigning the selected subscriber unit to operate on the selected transmit frequency.

5,590,157

DATA TERMINAL COMPRISING A DEMODULATOR FOR A FSK PHASE-COHERENT MODULATED SIGNAL

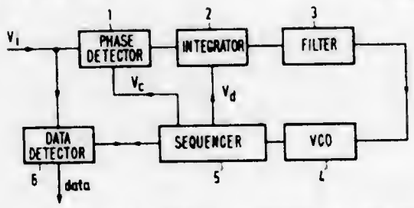
Cornelis C. M. Schuur, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 245,392, May 18, 1994, abandoned. This application Oct. 18, 1995, Ser. No. 544,791

Claims priority, application European Pat. Off., May 19, 1993, 93201445; Jun. 28, 1993, 93201872

Int. Cl.[6] **H03D** *3/18;3/02;* **H03L** *7/00*

U.S. Cl. 375—327 **6 Claims**



1. A data terminal including a demodulator for receiving a frequency-shift keyed (FSK) phase-coherent modulated signal having at least two frequencies, said demodulator including a phase-locked loop (PLL) circuit, said PLL circuit comprising:

phase detection and integration means for receiving said modulated signal and generating an integrated signal;

a filter coupled to said phase detection and integration means;

a controllable oscillator coupled to said filter for producing an oscillator signal;

sequencing means, responsive to said oscillator signal and coupled to said phase detection and integration means, for controlling said phase detection and integration means; and

logic means, responsive to said sequencing means, for extracting digital data from said modulated signal,

wherein said phase detection and integration means comprises means for integrating a portion of said modulated input signal resulting from a product of said modulated input signal and a control signal output by said sequencing means, further wherein said phase detection and integration means includes a switch/modulator circuit, an integrator and a delay circuit, and wherein said sequencing means controls said switch/modulator circuit and said integrator.

5,590,158

METHOD AND APPARATUS FOR ESTIMATING PSK MODULATED SIGNALS

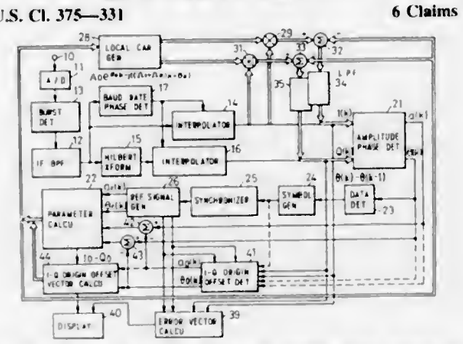
Takahioro Yamaguchi; Shinsuke Tajiri, both of Sendai, and Juichi Nakada, Kumagaya, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

Continuation of Ser. No. 186,603, Jan. 26, 1994, abandoned. This application Oct. 11, 1995, Ser. No. 538,943

Claims priority, application Japan, Jan. 28, 1993, 5-012304; Jan. 28, 1993, 5-012305

Int. Cl.[6] **H03D** *3/22;* **H04L** *27/22*

U.S. Cl. 375—331 **6 Claims**



4. A Phase-Shift Keying (PSK) modulated signal estimation method comprising the steps of:

converting an input PSK modulated signal to a digital signal;

obtaining a quadrature component of said digital signal with respect to an in-phase component of the digital signal;

obtaining an I-Q origin offset from said in-phase and quadrature components of said input PSK modulated signal and an in-phase component and a quadrature component of an ideal reference signal;

detecting an instantaneous amplitude and an instantaneous phase of the input PSK modulated signal from said in-phase and quadrature components of the input PSK modulated signal;

subtracting the amplitude and phase of said I-Q origin offset from the detected instantaneous amplitude and instantaneous phase of the input PSK modulated signal, respectively;

determining an ideal modulation symbol from the detected instantaneous phase;

generating said ideal reference signal corresponding to the determined ideal modulation symbol;

calculating an amplitude, an offset frequency and a phase error of the input PSK modulated signal using said ideal reference signal and the subtracted instantaneous amplitude and phase of the input PSK modulated signal; and

using the subtracted instantaneous amplitude and phase of the input PSK modulated signal to calculate said amplitude, said offset frequency and said phase error of the input PSK modulated signal.

5,590,159

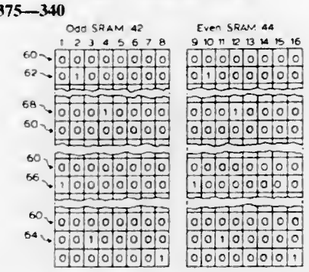
DIGITAL DATA SEQUENCE PATTERN FILTERING

Bradley T. Anderson, Carboro, N.C., assignor to Wandel & Goltermann Technologies, Inc., Research Triangle Park, N.C.

Filed Feb. 7, 1995, Ser. No. 384,855

Int. Cl.[6] **H04L** *27/06*

U.S. Cl. 375—340 **11 Claims**



1. A binary digital data sequence pattern recognition and filtering circuit for correlating a received pattern of combinations of binary bits with an expected sequence pattern of bit combinations and detecting when the received pattern of bit combinations matches the expected pattern of bit combinations, comprising:

at least one digital memory device having address inputs and data outputs, said address inputs being equal in number to the number of bits in said bit combination and said address inputs being connected so as to receive successive applications of the received bit combinations;

the contents of each memory location within the digital memory device appearing at the data outputs in response to the address of that memory location appearing at the address inputs;

each address location of the digital memory device having a capacity of binary bits at least equal to the number of bit combinations contained in the expected pattern of bit combinations;

a binary "1" stored in one of the bit position at each address location, of the digital memory device, the address of which corresponds to one of the bit combinations of the expected pattern of bit combinations, the bit position at which the binary "1" is stored within that address location corresponding to the position of the address bit combination within the expected pattern of bit combinations;

means for storing and delaying at least one binary "1" bit by at least a number of memory device cycles inversely equal to the positions of the associated address bit combination within the expected sequence pattern; and

means for sampling the output of the memory device, as delayed, and indicating reception of the expected pattern of bit combination when all binary "1" are noted.

5,590,160

SYMBOL AND FRAME SYNCHRONIZATION IN BOTH A TDMA SYSTEM AND A CDMA

Kjell Ostman, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

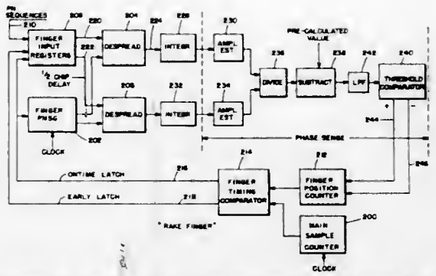
Continuation-in-part of Ser. No. 998,903, Dec. 30, 1992, Pat. No. 5,408,504. This application Feb. 10, 1995, Ser. No. 387,031

Int. Cl.[6] **H04L** *7/02;27/30*

U.S. Cl. 375—367 **7 Claims**

4. A system for phase synchronizing a receiver in a radio communication system which operates in a code-division multiple access (CDMA) environment and receives a signal stream including a spread spectrum stream having a spread spectrum signal comprising data encoded with pseudo-random noise (PN) sequences of chips, said system comprising:

means for generating a local PN sequence of chips at said receiver;



means for sampling a received spread spectrum signal at first and second sample times during each of a plurality of chips in a received PN sequence, said first and second sample times separated by a partial chip interval;

means for despreading samples made at said first and second sample times under control of said local PN sequence of chips;

means for deriving despreading values from the result of said despreading of samples made at said first and second sample times under control of said local PN sequence of chips;

means for calculating a ratio between said first and second despreading values;

means for deriving an error signal based upon a difference between said ratio and a predetermined desired value; and

means for employing said error signal to adjust a time of occurrence of said first and second sample times so as to reduce said error signal.

5,590,161

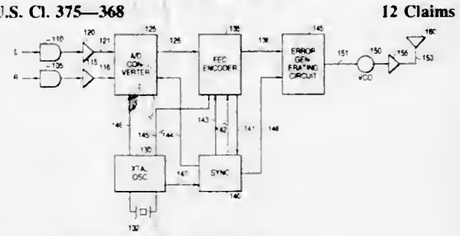
APPARATUS FOR SYNCHRONIZING DIGITAL DATA WITHOUT USING OVERHEAD FRAME BITS BY USING DELIBERATELY INTRODUCED ERRORS FOR INDICATING SUPERFRAME SYNCHRONIZATION OF AUDIO SIGNALS

William C. Meyn, Hanover, and Stanley Schneider, Annapolis, both of Md., assignors to Tektron Micro Electronics, Inc., Hanover, Md.

Filed Aug. 23, 1994, Ser. No. 294,752

Int. Cl.[6] **H04L** *7/00*

U.S. Cl. 375—368 **12 Claims**



1. A transmission system, comprising:

input ports for receiving first and second signals;

an A/D converter connected to the input ports for converting the first and second signals into a digital bit stream, wherein the first and second signals are simultaneously sampled at a predetermined frequency and a 2n bits of the digital bit stream are generated as a result thereof, wherein the 2n bits of the digital bit stream comprise a first n-bit digital bit pattern representing the first signal and a second n-bit digital bit pattern representing the second signal;

an encoder, connected to the A/D converter, for encoding m bits of the digital bit stream and outputting an (m+r) bit encoded bit stream comprising the m bits of the digital bit stream and r check bits, wherein a data rate of the (m+r) bit encoded bit stream is at a ratio of (m+r)/m to a data rate of the digital bit

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stream, and wherein the encoder outputs a first pulse for each n sequential bits of the digital bit stream encoded;

a frequency generator for supplying a stable frequency to the A/D converter and the encoder;

a synchronization circuit receiving the stable frequency from the frequency generator and the first pulse from the encoder and creating a second pulse at a time corresponding to a common multiple of 2n and m;

an error generator, connected to the encoder and the synchronization circuit, for generating an error in a bit in the (m+r) bit encoded bit stream for every occurrence of the second pulse and outputting an error-containing bit stream;

a modulator, connected to the error generator, for modulating an rf carrier with the error-containing bit stream according to a predetermined modulation technique to provide a modulated signal and to allow for low probability of detection of the modulated rf carrier; and

an output port for outputting the modulated signal.

5,590,162

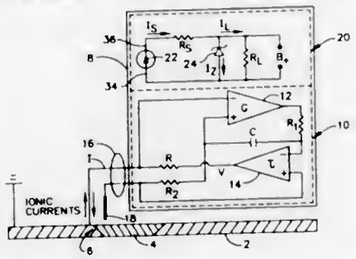
STAND-ALONE POWER SUPPLY ENERGIZED BY DECAY OF RADIOACTIVE IOSTOPE

James H. Terhune, San Jose, and Barry M. Gordon, Monte Sereno, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 384,997, Feb. 7, 1995, which is a continuation-in-part of Ser. No. 239,773, May 9, 1994, Pat. No. 5,444,747. This application Jul. 21, 1995, Ser. No. 505,727

Int. Cl.[6] G21D *7/00*

U.S. Cl. 376—320 **6 Claims**



1. A method for powering an electrical circuit inside a nuclear reactor, comprising the steps of:

installing an electrical circuit inside a nuclear reactor;

selecting an isotopic material which has the property, when placed at a predetermined location within a neutron flux inside the nuclear reactor, or capturing neutrons from the neutron flux and being activated by neutron capture to a radioactive state having a subsequent decay chain during which at least one β-particle is emitted;

constructing a β-battery by placing a metallic collector in relationship to a mass of said selected isotopic material so that β-particles emitted by said selected isotopic material are collected;

placing said β-battery in an unactivated state at said predetermined location within the neutron-flux; and

connecting said β-battery to said electrical circuit.

5,590,163

FREQUENCY DIVIDER CIRCUIT, FREQUENCY SYNTHESIZER COMPRISING SUCH A DIVIDER AND RADIO TELEPHONE COMPRISING SUCH A SYNTHESIZER

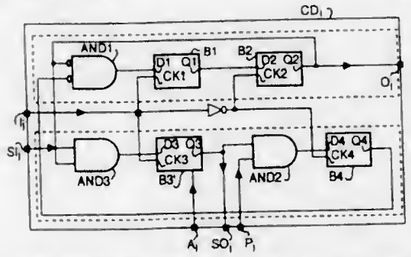
Yves Dufour, Sunnyvale, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1995, Ser. No. 432,746

Claims priority, application France, May 4, 1994, 94 05483

Int. Cl.[6] H03K *23/66*

U.S. Cl. 377—110 **9 Claims**



1. A programmable frequency divider circuit comprising p cascade-connected frequency-dividing cells, where p is an integer greater than one, each of said p cascade-connected frequency-dividing cells representing a division of rank i, all of said p cascade-connected frequency-dividing cells being switchable between a normal divide-by-two mode, and a programmed divide-by-three mode, each of said p cascade-connected frequency-dividing cells comprising:

a first input for receiving an input frequency signal;

a first output for supplying an output frequency signal to be applied to the first input of an immediately following cascade-connected frequency-dividing cell;

a second input for receiving an enable signal for the programmed mode;

a third input for receiving a programming signal; and

a second output for supplying a signal generated in response to the enable signal applied to the second input, wherein said signal at the second output of one of said p cascade-connected frequency-dividing cells is applied to the second input of immediately preceding cascade-connected frequency-dividing cell as an enable signal, characterized in that at least one of said p cascade-connected frequency-dividing cells further comprises an additional input for receiving a signal to disable said at least one cascade-connected frequency-dividing cell.

5,590,164

METHOD AND APPARATUS FOR X-RAY COMPUTED TOMOGRAPHY

Hiroyuki Kawai, Tokyo; Kensuke Sekihara, Musashimurayama, and Shinichi Migita, Ryugasaki, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 456,382

Claims priority, application Japan, Jun. 28, 1994, 6-146332

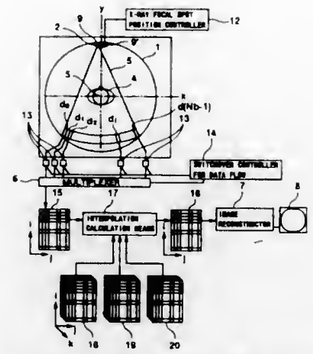
Int. Cl.[6] A61B *6/00*

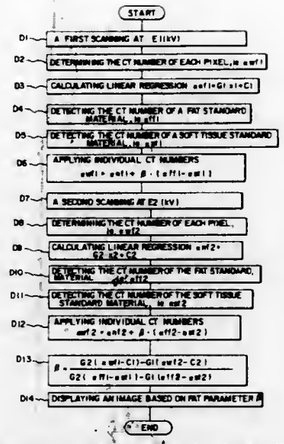
U.S. Cl. 378—4 **21 Claims**

1. An X-ray computed tomography apparatus for reconstructing a distribution of X-ray attenuation coefficient within an object on the basis of projection data derived from a plurality of directions, said X-ray computed tomography apparatus comprising:

an X-ray source for continuously generating X-rays to expose said object thereto;

an arrangement of a plurality of X-ray detector elements disposed on an opposite side of said X-ray source from said object, said X-ray detector elements being arranged with a predetermined arrangement pitch angle to measure X-rays transmitted through said object as projection data;





means for rotating positions of said X-ray source and said arrangement of X-ray detector elements by minute angles;

control means for shifting an X-ray focal spot position of said X-ray source;

a plurality of first temporary holding means respectively connected to said X-ray detector elements, a measured value of X-ray intensity transmitted through said object to be incident on one of said X-ray detector elements being temporarily held in one of said first temporary holding means;

switch means for switching over connection between said X-ray detector elements and said first temporary holding means;

switchover control means for controlling switchover of said switch means;

transfer means for transferring said measured value from said first temporary holding means to interpolation calculating means;

interpolation calculating means for performing interpolation calculations on said projection data including said measured value to generate projection data equivalent to projection data measured by using a measuring system virtually having twice as many X-ray detector elements as said arranged X-ray detector elements;

image reconstruction means for reconstructing the distribution of X-ray attenuation coefficient within the object on the basis of the projection data generated by said interpolation calculating means; and

a memory for holding parameters used for calculations in said interpolation calculating means.

5,590,165

METHOD FOR GENERATING FAT DISTRIBUTION IMAGE BY CT SYSTEM

Makoto Gohno, and Tetsuya Horiuchi, both of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP93/00696, § 371 Date Nov. 9, 1994, § 102(e) Date Nov. 9, 1994, PCT Pub. No. WO93/24054, PCT Pub. Date Dec. 9, 1993

PCT Filed May 25, 1993, Ser. No. 335,772

Claims priority, application Japan, May 26, 1992, 4-133204

Int. Cl.[6] A61B *6/03*

U.S. Cl. 378—18 **2 Claims**

1. A method for generating a fat distribution image by a CT system wherein an image of fat distribution is generated from a cross sectional image data via X ray, comprising the steps of a scanning step wherein scanning is effected at least at two different levels of X-ray tube voltage using a phantom containing a sample rod of a fat standard material in addition to plural sample rods with different densities of a bone mineral equivalent material to generate at least two cross sectional image data, a CT number detecting step wherein the CT number of each pixel in the whole region or an objective region of the cross sectional image data is detected as the "CT number of a tissue including fat", ie. αwf, a linear regression calculating step wherein the CT number of the bone mineral equivalent material is detected in the cross sectional image data following the principle of quantitative measurement of bone mineral mass to calculate a linear regression between the CT number and the density of the bone mineral equivalent material and to define the CT. number as the "CT number of a tissue excluding fat", ie. αnf, a fat standard material CT number detecting step wherein the "CT number of the fat standard material", ie. αff is detected in the cross sectional image data, a soft tissue standard material CT number detecting step wherein the CT number of blood in the cross sectional image data is detected as the "CT number of a soft tissue standard material", ie. αst, a CT number application step wherein "α" in the equation $\alpha=\alpha wf-\alpha nf$ is defined as the variation of the CT number due to fat while "β" in the equation $\alpha=\cdot\{\alpha ff-\alpha st\}$ is defined as a fat ratio parameter and the "CT number of a tissue including fat" ie. αwf, etc., is applied to the equation

$$\alpha wf=\alpha nf+\beta\cdot\{\alpha ff-\alpha st\} \qquad \text{Equation (A)}$$

a fat ratio parameter calculating step wherein the density of the bone mineral equivalent material and the "CT number of a tissue excluding fat", ie. αnf is deleted in at least two linear regressions calculated at the linear regression calculating step and in at least two equations (A) to be applied at the CT number application step, to calculate the fat ratio parameter β on the basis of the detected CT number of each pixel at the CT number detecting step, and a fat ratio parameter image generation step wherein an image is generated on the basis of the calculated fat ratio parameter β.

5,590,166

MAMMOGRAPHY UNIT

Jarmo Suni, Espoo, and Petri Rantanen, Tuusula, both of Finland, assignors to Instrumentarium Corporation, Finland

Filed Dec. 28, 1995, Ser. No. 579,220

Int. Cl.[6] A61B *6/04*

U.S. Cl. 378—37 **6 Claims**

1. A mammography unit, comprising a C-arm which is mounted on a turning axle (2) adapted to be vertically (arrow C) movable on an upright column (1) and which is pivotable about the turning axle (2) (arrow D), one leg (3) of said C-arm being provided with an X-ray tube (4) and the opposite leg (5) with an image receptor, and said unit further comprising a compression element (6) for compressing the breast to be imaged against the image receptor, said C-arm being further adapted to move linearly (arrow A) in substantially radial directions in the direction transverse to the turning axle (2), in which unit the compression element (6) is mounted on the C-arm and travels essentially linearly relative to the C-arm lengthwise of the C-arm and simultaneously with the

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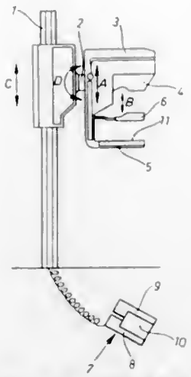


C-arm radially relative to the turning axle, said unit comprising elements for controlling the linear motorized movement of the C-arm (arrow A) and the relative compressive movement of the compression element (6) (arrow B) to occur simultaneously at a substantially equal but oppositely directed speed for compressing the breast between the compression element and the image receptor.

5,590,167

DIGITAL PANORAMIC X-RAY IMAGING APPARATUS

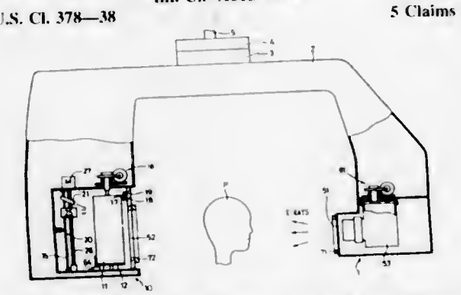
Yoshinori Arai, Tokyo, Japan, assignor to J. Morita Manufacturing Corporation, Kyoto, Japan

Filed Mar. 7, 1996, Ser. No. 613,383

Claims priority, application Japan, Mar. 10, 1995, 7-051106; Feb. 29, 1996, 8-042952

Int. Cl.[6] A61B *6/14*

U.S. Cl. 378—38 **5 Claims**



1. A digital panoramic X-ray imaging apparatus for performing tomographic imaging along a predetermined tomographic plane of a subject, said apparatus comprising:

an X-ray generator for irradiating a subject with X-rays;

an X-ray imaging device for detecting an image of X-rays having passed through the subject; and

a swivel member for supporting the X-ray generator and the X-ray imaging device and for rotating the X-ray generator around the subject;

wherein the X-ray imaging device comprises a rotation drum disposed in parallel with a rotation shaft of the swivel member, a storage fluorescent sheet disposed on the circumferential surface of the rotation drum, an excitation light source for irradiating the storage fluorescent sheet with excitation light, a light receiving portion for receiving accelerated-phosphorescence emission generated from storage fluorescent sheet by excitation light irradiation, a rotation drive portion for performing primary scanning by rotating the rotation drum, and a linear drive portion for performing secondary scanning by moving the excitation light source and the light-receiving portion in the axial direction of the rotation drum.

5,590,168

X-RAY MICROSCOPE

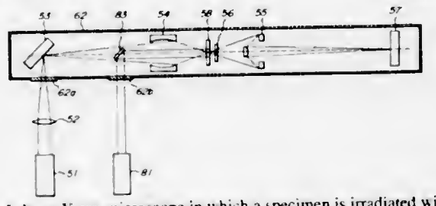
Yoshinori Iketaki, Oume, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 171,719, Dec. 22, 1993, Pat. No. 5,450,463. This application Jun. 6, 1995, Ser. No. 466,973

Claims priority, application Japan, Dec. 25, 1992, 4-347051; Dec. 25, 1992, 4-347083; Mar. 1, 1993, 5-040012; Mar. 2, 1993, 5-041219; Mar. 11, 1993, 5-050873; Mar. 12, 1993, 5-052269; Mar. 12, 1993, 5-052410

Int. Cl.[6] G21K *7/00*

U.S. Cl. 378—43 **1 Claim**



1. In an X-ray microscope in which a specimen is irradiated with X-rays having a wave length region of 65 to 43.7Å and ultraviolet rays and X-rays transmitted through the specimen are received by an X-ray detector to form a transmitted X-ray microscopic image of the specimen, the improvement being characterized in that a ultraviolet transmissive window is provided in a wall of a vacuum chamber in which an X-ray optical system of the X-ray microscope is arranged and the ultraviolet rays are made incident upon the specimen through said window as a converged or parallel ultraviolet beam.

5,590,169

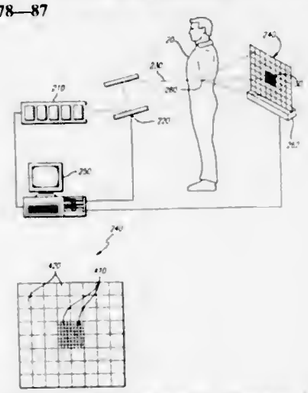
RADIATION IMAGING SYSTEM

Sergio L. P. Monteiro, 15166F Campus Park Dr., Moorpark, Calif. 93021

Filed Jan. 9, 1995, Ser. No. 369,802

Int. Cl.[6] G01N *23/201*

U.S. Cl. 378—87 **6 Claims**



1. A radiation imaging system for producing images of a scanned object comprising:

a radiation source for applying, to at least one point of the object, a collimated radiation beam extending in an incident direction;

detector means for producing a first electrical signal having a first value representing the energy of the portion of said beam that transmits through the object along the incident direction and a second electrical signal representing the energy of the scattered portion of said beam scattered from the incident direction by the object;

information processing means for receiving said first and second electrical signals and displaying a visual representation of the point of the object by using a combination of the information content of said first and second electrical signals;

a scanner assembly for moving said beam in a scanning pattern throughout a surface zone of the object and said source applying said beam intermittently throughout the surface zone and said detector means producing first and second electrical signals for each point representing respectively the energy level of the incident beam transmitted portion and energy level of the scattered beam portion;

wherein said detection means comprises a detector array of individual detectors arranged generally in a plane oriented generally perpendicular to the incident direction of said beam and a positioning means for maintaining the more centrally located detectors at a position to intercept the beam incident direction as the scanner moves the incident beam in a scanning pattern;

wherein said first electrical signal has a value representative of the outputs of the more centrally located detectors and said second signal has a value representative of the combined outputs of the other than centrally located detectors; and

wherein said more centrally located detectors have a smaller detection area than that of said other than centrally located detectors.

5,590,170

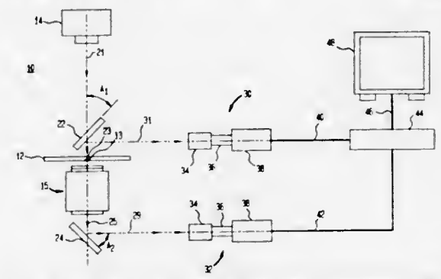
X-RAY INSPECTION SYSTEM

Gilbert Zweig, Morris Plains, N.J., assignor to Glenbrook Technologies, Morris Plains, N.J.

Continuation-in-part of Ser. No. 46,604, Apr. 12, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,465

Int. Cl.[6] G01N *23/04*

U.S. Cl. 378—63 **3 Claims**



1. An X-ray inspection system for electronic components including printed circuit boards comprising:

X-ray means for generating an X-ray beam for producing an X-ray image of an object, said object being said electronic component;

fluoroscopic imaging means for converting said X-ray image of said object to a fluoroscopic image, said fluoroscopic imaging means includes a thin luminescent phosphor means optically coupled to a microchannel plate image intensifier for providing a substantially high resolution fluoroscopic X-ray image of said object;

a first mirror positioned between said object and said X-ray means at an angle A_1, said mirror creating an optical image of said predetermined location of said object, said mirror being formed of a composition having at least one element with an atomic number of less than 14, said X-ray beam passes through said first mirror to said object and onto said fluoroscopic imaging means, said mirror being relatively transparent to said X-ray beam,

first video camera means for viewing said fluoroscopic X-ray image and generating first video output of said fluoroscopic X-ray image;

second video camera means for viewing said predetermined location of said object as an optical image and generating second video output of said optical image; and

video monitor means for receiving said first video output of said first video camera means and said second video output of said second video camera means,

wherein said fluoroscopic X-ray image and said optical image appear at substantially equal magnification on said video monitor means, and said mirror is formed of boron carbide.

5,590,171

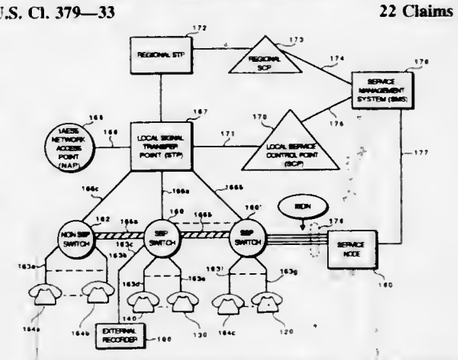
METHOD AND APPARATUS FOR COMMUNICATIONS MONITORING

Wayne Howe, Alpharetta, and Dale Malik, Dunwoody, both of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Continuation of Ser. No. 271,191, Jul. 7, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,648

Int. Cl.[6] H04M *1/24;3/08;3/22*

U.S. Cl. 379—33 **22 Claims**



1. In an intelligent switched telephone network, a method for allowing a communication in said intelligent switched telephone network from a calling party to a called party to be monitored by a monitoring party through said intelligent switched telephone network, regardless of the respective locations of said calling party, said called party or said monitoring party, comprising the steps of:

receiving said communication in said intelligent switched telephone network;

reading identification information associated with said communication for a calling line or called party number;

searching for a matching entry to said calling line or called party number in a monitoring list maintained by said intelligent switched telephone network, said searching being conducted to determine whether communications to or from said calling line or called party number are to be monitored;

routing said communication through said intelligent switched telephone network from said calling party to said called party; and

only in response to finding said matching entry, establishing a bridge from said communication to said monitoring party, said bridge allowing said monitoring party to monitor said communication through said intelligent switched telephone network regardless of the respective locations of said calling party, said called party or said monitoring party.

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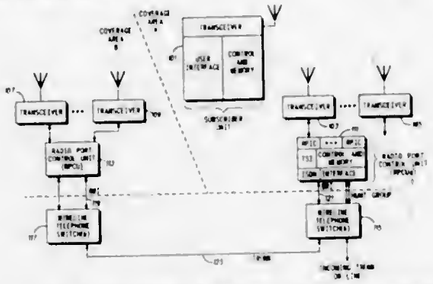
5,590,172

METHOD AND SYSTEM FOR TRANSFERRING A RADIOTELEPHONE CALL FROM ONE COVERAGE AREA TO ANOTHER

John P. Lodwig, Naperville; Kenneth A. Felix, Crystal Lake, both of Ill., and Charles L. Whittington, Colleyville, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 85,374, Jul. 2, 1993, abandoned. This application Apr. 29, 1996, Ser. No. 639,538
Int. Cl.[6] H04Q 7/20;7/38;7/22
U.S. Cl. 379—58 9 Claims



1. A method of transferring a user message-conveying radiotelephone call by a subscriber unit from a first radio coverage area, served by a first fixed control unit which is coupled to a wireline telephone switch, to a second radio coverage area served by a second fixed control unit, the method comprising the steps of:

transmitting a directory number, associated with the first fixed control unit and the wireline telephone switch, the directory number identifying a wireline telephone number of the first fixed control unit, from the first fixed control unit to the subscriber unit;

storing the transmitted directory number at the subscriber unit;

transmitting the stored directory number from the subscriber unit to the second fixed control unit when a need for transfer of the radiotelephone call to the second fixed control unit from the first fixed control unit is determined;

dialing the transmitted directory number from the second fixed control unit;

in response to the dialing of the directory number, connecting the second fixed control unit to the first fixed control unit via the wireline telephone switch; and

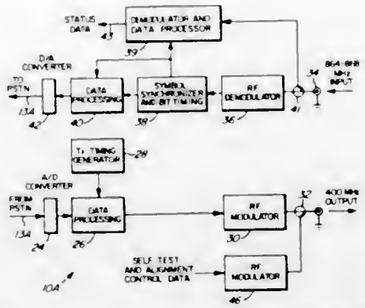
transferring control of the radiotelephone call from the first fixed control unit to the second fixed control unit by dialing the transmitted directory number from the second fixed control unit.

5,590,173

DELAY INSENSITIVE BASE STATION-TO-HANDSET INTERFACE FOR RADIO TELEPHONE SYSTEMS

Andrew S. Beasley, Box 38, Lake Errock, B.C., Canada

Continuation of Ser. No. 357,065, Dec. 14, 1994, abandoned, which is a continuation of Ser. No. 924,904, Aug. 5, 1992, abandoned. This application Aug. 22, 1995, Ser. No. 517,608
Int. Cl.[6] H04Q 7/20
U.S. Cl. 379—58 7 Claims



1. A method of exchanging telephone signals between a basestation and a mobile cordless time division duplex (TDD) handset, comprising the steps of:

passing transmit signals as frequency division duplex (FDD) signals from said basestation to a remote antenna driver;

converting said transmit signals to time division duplex (TDD) signals at said remote antenna driver;

broadcasting said time division duplex signals to said handset;

receiving at said remote antenna driver TDD receive signals broadcast by said handset, said TDD receive signals including bit clock timing;

converting said TDD receive signals to FDD receive signals at said remote antenna driver;

passing said FDD receive signals to said basestation; and

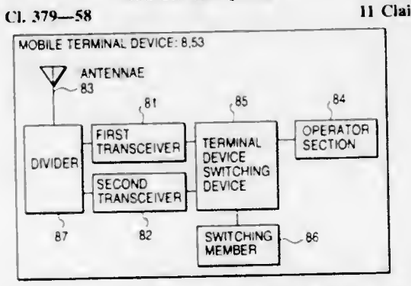
deriving bit clock timing from said FDD receive signals at said basestation and employing said bit clock timing to process said FDD receive signals.

5,590,174

APPARATUS AND METHOD FOR MOBILE COMMUNICATION NETWORK WHICH ENSURES THAT A USER WHO IS OUT OF A SERVICE AREA CAN RECEIVE AN INCOMING CALL FROM ANOTHER SERVICE AREA

Toshiya Tsuji, and Masahiko Yahagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,374
Claims priority, application Japan, Dec. 17, 1993, 5-318336
Int. Cl.[6] H04Q 7/38
U.S. Cl. 379—58 11 Claims



1. An apparatus for providing mobile communication in association with a public fixed communication network and a subscriber communication system by a fixed terminal device connected in said public fixed communication network, said apparatus comprising:

a plurality of base stations for providing a first service area for radio communication with a mobile terminal device and a first portable device operating within said first service area;

a terminal device switching means operating in association with said public fixed communication network for controlling call processing of calls of said mobile terminal device, and having a database on which location information of said mobile terminal device are registered; and

a network terminal fixed device operating in association with said public fixed communication network for providing a second service area for radio communication with a second portable device within said second service area;

wherein said first portable device is integrally provided with:

a call circuit, providing an equivalent function to said second portable device for radio communication with said network terminal fixed device, said call circuit including:

mode switching means for choosing between a first portable device mode and a second portable device mode; and

transmission circuit means for transmitting an operating status of said mode switching means to said terminal device switching means via said base stations; and

wherein said terminal device switching means is provided with:

registering means for registering said operating status of said mode switching means and a subscriber number assigned to said network terminal fixed device in said database; and

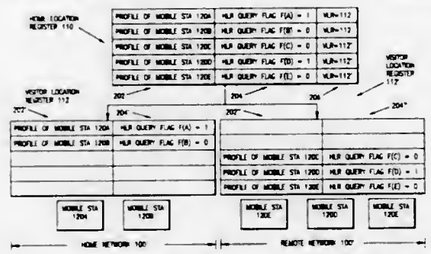
call forwarding means for transferring a call directed to said first portable device to said network terminal fixed device whose subscriber number is being registered in said database when said operating status of said mobile switching means indicates said second portable device mode.

5,590,175

METHOD AND SYSTEM FOR ENHANCED CALL COMPLETION IN TELECOMMUNICATIONS MOBILITY APPLICATIONS

John K. Gallant, and Steven R. Donovan, both of Plano, Tex., assignors to MCI Communications Corporation, Washington, D.C.

Filed May 17, 1995, Ser. No. 443,185
Int. Cl.[6] H04Q 7/22
U.S. Cl. 379—58 4 Claims



1. A method of directing calls from a public switch telephone network to a mobile station within a mobile telephone network, the mobile telephone network including a plurality of mobile telephone stations, a plurality of base stations for communicating with the mobile telephone stations, a plurality of mobile services switching centers for routing calls between base stations and between base stations and the public switch telephone network, a plurality of visitor location registers for storing data relating to visiting mobile telephone stations, and at least one home location register for storing all management data relating to all mobile telephone stations in the mobile telephone network, the method comprising the steps of:

receiving a call directed to a mobile telephone station from a public switch telephone network in a mobile services switching center;

attempting to locate a profile of the mobile telephone station in a visitor location register, the profile having an HLR query flag for indicating whether the home location register should be queried;

checking a status of the HLR query flag, if the profile of the mobile telephone station is located in the visitor location register;

sending a query message to a home location register requesting routing information for the call, if the HLR query flag is set to yes;

completing the call to the mobile telephone station using the profile in the visitor location register, if the HLR query flag is set to no;

sending a query message to the home location register requesting routing information for the call, if the mobile telephone profile is not found in the visitor location register; and

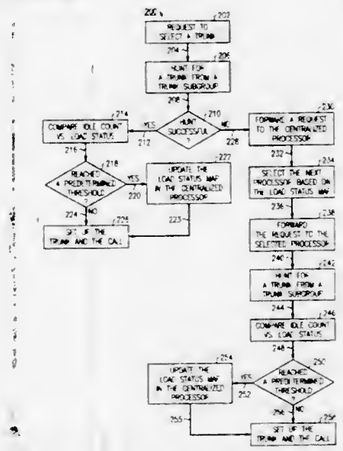
completing the call to the mobile telephone station using the routing information received from the home location register, if a query message requesting routing information has been sent to the home location register.

5,590,176

ARRANGEMENT FOR LOCAL TRUNK HUNTING IN A DISTRIBUTED SWITCHING SYSTEM

Anjana Agarwal, Wheaton, and Chinmei C. Lee, Woodridge, both of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 114,020, Aug. 30, 1993, abandoned. This application Jun. 22, 1995, Ser. No. 493,779
Int. Cl.[6] H04Q 7/24
U.S. Cl. 379—59 12 Claims



1. A switching system having a distributed architecture including a centralized processor, a communication module and a plurality of switching modules with each of the switching modules having a local processor and a subgroup of trunks connecting to another switching system, comprising:

means for receiving a trunk request for a destination at one local processor of one of the plurality of switching modules;

means for interrogating a trunk subgroup availability bitmap in said local processor to determine if a trunk of the trunk subgroup can fulfill the trunk request and if such a trunk of the trunk subgroup is available;

means for assigning the available trunk to the requesting station if a trunk of the subgroup that fulfills the trunk request is available;

means for requesting an alternate one of the plurality of switching modules to assign an alternate trunk on an alternate local processor from the centralized processor if a trunk of the subgroup that fulfills the trunk request is not available;

means for fulfilling the trunk request by a trunk from the trunk subgroup of the alternate switching module;

means for storing a plurality of at least three trunk loading statuses in each trunk subgroup availability bitmap for each switching module in the centralized processor; and

wherein said centralized processor has an trunk subgroup availability bitmap that is updated by each switching module if a threshold of one of a plurality of trunk loading statuses of its respective switching module is exceeded.

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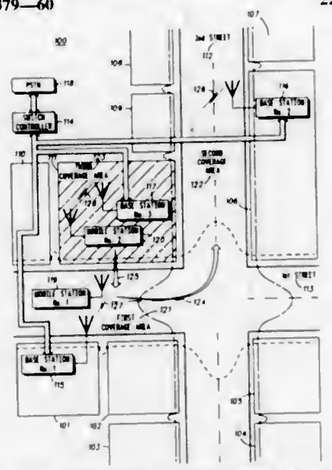
5,590,177

METHOD FOR PREVENTING A DROPPED CALL DURING A HANDOFF IN A RADIOTELEPHONE SYSTEM

Richard J. Vilmur, Palatine, and Eugene J. Bruckert, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1994, Ser. No. 316,697
Int. Cl.[6] H04Q *7/22;* **H04J** *13/02*
U.S. Cl. 379—60 **22 Claims**



1. In a cellular radiotelephone communication system including at least one switch controller, a plurality of base stations including first and second base stations, and at least one mobile station, wherein a switch controller is coupled to the first and second base stations to provide radiotelephone communication throughout first and second coverage areas, respectively, wherein a mobile station is in an active call in the first coverage area with the first base station on a first traffic channel and substantially shadowed from transmissions from the second base station in the second coverage area, a method, performed by the mobile station, for preventing the active call from being dropped when the mobile station suddenly transitions from the first coverage area to the second coverage area, the method comprising the steps of:

determining that the active call is in danger of being dropped responsive to the mobile station suddenly transitioning from the first coverage area to the second coverage area;

notifying the first base station that the active call is in danger of being dropped responsive to the step of determining that the active call is in danger of being dropped;

determining that the active call with the first base station is in the process of being dropped responsive to the step of notifying the first base station that the active call is in danger of being dropped; and

establishing the active call with the second base station in the second coverage area before the active call with the first base station is dropped responsive to the step of determining that the active call with the first base station is in the process of being dropped.

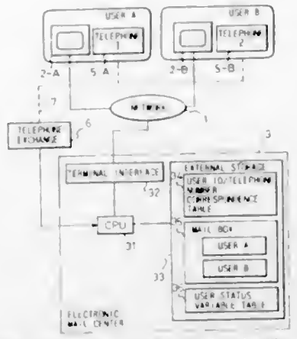
5,590,178

ELECTRONIC MAIL SYSTEM LINKED WITH TELEPHONE

Masahiko Murakami; Masahiro Matsuda, and Noriyuki Fukuyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 27, 1994, Ser. No. 266,225
Claims priority, application Japan, Sep. 28, 1993, 5-241556
Int. Cl.[6] H04M *11/00;1/64;* **H04N** *7/14*
U.S. Cl. 379—96 **54 Claims**

1. An electronic mail system linked with a telephone system, comprising:



an electronic mail system composed of a plurality of terminals connected through a network, and an electronic mail center via which electronic mail is exchanged among users of said terminals; and

a telephone system composed of a plurality of telephones and a telephone exchange for connecting said telephones,

wherein

said telephones are associated in advance with individual users of said electronic mail system,

said electronic mail center comprises:

correspondence table storing means for storing a table of correspondence between user IDs and telephone numbers as well as electronic mail for individual users;

a terminal interface for identifying the users using said terminals; and

status variable managing means for managing status variables by which to recognize the mail each individual user is currently reading,

said telephone exchange, upon reception of a call request, notifies the calling telephone number to said electronic mail center, and

said electronic mail center identifies the user ID of the calling user corresponding to the notified telephone number by referencing said correspondence table, and transmits, upon connection of the call, electronic mail messages or lists of electronic mail messages associated with the calling user to the login terminal of the calling user, the electronic mail messages or the lists of electronic mail messages thus transmitted being displayed on said login terminal of the calling user.

5,590,179

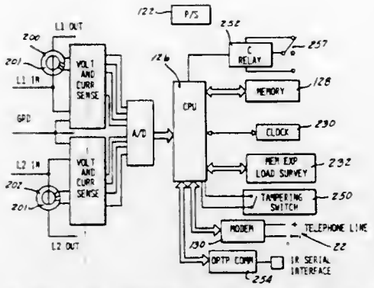
REMOTE AUTOMATIC METER READING APPARATUS

John T. Shincovich, North Canton; Jan K. Michalek; Norman C. Baldwin, both of Newark; Ebrahim Shahrodi, Delaware, all of Ohio; Darrell Robinson, Highland, Mich.; Allen V. Pruehs, Howell, Mich., and Robert O. Learmont, Walled Lake, Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 17,650, Feb. 12, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,495
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—107 **12 Claims**

1. A remote metering system, including a central computer and a plurality of digital meters installed at locations remote from said central computer, said central computer including communicating means for remotely communicating with each of said plurality of digital meters, each of said plurality of digital meters including:

a current sensing circuit and voltage sensing circuit for sensing current and voltage, respectively, of electricity passing through said meter and producing current and voltage signals indicative of a magnitude sensed current and voltage;



an analog-to-digital converter, responsive to said current and voltage signals, for producing a plurality of digital signals at predetermined time intervals indicative of said sensed current and voltage;

processing means, responsive to said plurality of digital signals, for calculating an amount of electrical power passing through said meter and producing consumption signals indicative of consumed power for each predetermined time interval;

memory means, responsive to said processing means, for storing data indicative of said consumed power; and

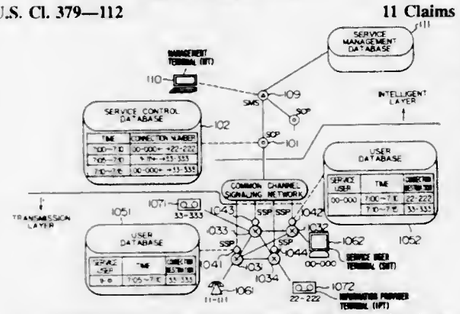
power outage detection means, responsive to said voltage sensing circuit, for detecting a power outage condition and storing outage data indicative of said power outage condition in said memory means, wherein said power outage detection means includes outage type determination means for determining if said power outage condition is one of a first type power outage condition and a second type power outage condition, wherein said power outage detection means includes means for disabling operation of said meter responsive to a determination that said power outage condition is a first type power outage condition.

5,590,180

COMMUNICATION METHOD OF SUPPLYING INFORMATION IN INTELLIGENT NETWORK AND APPARATUS THEREFOR

Yukiko Tonomura; Yoshito Sakurai, both of Yokohama, and Yumiko Nishi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 314,373
Claims priority, application Japan, Sep. 30, 1993, 5-244252
Int. Cl.[6] H04M *15/00*
U.S. Cl. 379—112 **11 Claims**



1. A communication method for providing information in an intelligent network including a transmission layer having a user terminal and a switching system connected through a first network and an intelligent layer connected to said transmission layer through a second network for issuing a connection command of a line to said transmission layer, comprising the steps of:

entering by a user a connection number of the user terminal, a connection number of an information provider terminal and a time to receive an information providing service into a user database provided in said transmission layer;

reading data registered in said user database into a service control database provided in said intelligent layer;

collating a current time with the time to receive the information providing service read in said service control database by a timer circuit provided in said intelligent layer;

automatically connecting said user terminal to said information provider terminal when a service start time is reached as a result of the collation;

collating a current time with a service end time by said timer circuit; and

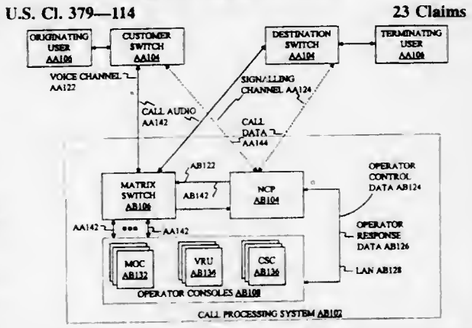
automatically disconnecting the connection between said user terminal and said information provider terminal when the service end time is reached as a result of the collation.

5,590,181

CALL-PROCESSING SYSTEM AND METHOD

Steven J. Hogan; Kristi T. Feltz; Douglas R. Murdock; Todd A. Goodman; David J. Vercande; Michael R. Tangeman; Eric M. Busch; Raghavan Kripakaran; Madhigubba G. Jayasimha; Keith E. Smith; Mark A. Austin, and Dana B. Berry, all of Cedar Rapids, Iowa, assignors to Link USA Corporation, Cedar Rapids, Iowa

Filed Oct. 15, 1993, Ser. No. 136,211
Int. Cl.[6] H04M *15/00;7/00*
U.S. Cl. 379—114 **23 Claims**



1. A call-processing system for processing a telephone call comprising call audio and call data, wherein the call audio of the telephone call is routed to a destination by a matrix switch that includes a matrix switch processor, the call-processing system comprising:

a network control processor that provides an interface between the matrix switch and a common channel signaling network, said network control processor comprising:

means for receiving the call data for the telephone call, that is intended for the matrix switch, from said common channel signaling network,

means for determining a routing for the call audio of the telephone call,

means for sending switch control data to the matrix switch processor of the matrix switch to effect said routing of the call audio of the telephone call, and

means for sending operator control data to an operator console connected to the matrix switch via a connection between said network control processor and said operator console to support a telephone call that requires operator assistance.

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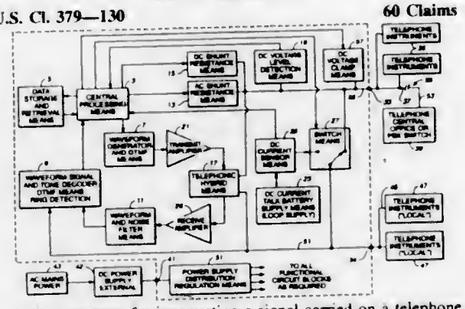
5,590,182

SYSTEM FOR INTERCEPTION AND TRANSMISSION OF COMMUNICATION SIGNALS ON TELEPHONE AND DATA LINES

Jessica L. Stevens, and Bonnie Crystal, both of Foster City, Calif., assignors to Telegen Corporation, Foster City, Calif.

Filed Jun. 22, 1994, Ser. No. 264,041
Int. Cl.[6] H04M *1/50*
U.S. Cl. 379—130 **60 Claims**



1. An apparatus for intercepting a signal carried on a telephone line that links a signal transmitter to a signal receiver, the signal receiver having signal detection filters with predetermined passbands and having valid signal decoder ranges, the apparatus comprising:

a waveform generating means for producing an interfering signal having a component frequency that is inside the passbands of the signal detection filters but outside the valid signal decoder ranges, so that a substantial portion of the interfering signal passes through at least one of the filters and has an amplitude above a predetermined noise threshold; and

a coupling means for introducing the interfering signal into the telephone line while the signal is carried on the line;

whereby the portion of the interfering signal which passes through one of the filters is interpreted by the signal receiver as noise, and causes the signal to be not recognized by the signal receiver.

5,590,183

KEEP CALL BACK DEVICE

Norihiro Yoneda; Toshimitsu Ohba; Reiko Furuya, and Kiyotaka Shikata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

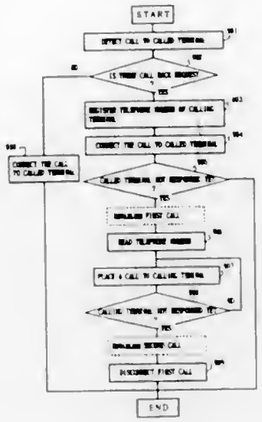
Filed Nov. 18, 1994, Ser. No. 342,245
Claims priority, application Japan, Mar. 18, 1994, 6-087120
Int. Cl.[6] H04M *1/56;15/06;3/42*
U.S. Cl. 379—142 **9 Claims**

1. A keep call back device for use in telephone communication between subscribers, the keep call back device comprising:

a first call establishing means for establishing a first call by establishing a call received from a calling terminal to a called terminal, wherein the calling terminal can respond to a call from one terminal without ending communication with another terminal during communication with said another terminal;

a second call establishing means for establishing a second call by placing a call to said calling terminal after said first call has been established and for connecting said second call between said calling terminal and said called terminal if said calling terminal responds to the call from the one terminal; and

a call releasing means for releasing said first call by disconnecting said first terminal when said second call is established.

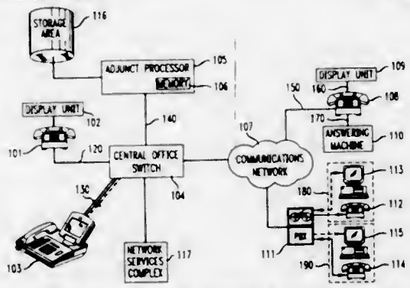


5,590,184

COMMUNICATIONS PRIVACY PROTECTION SYSTEM BY REPLACING CALLING PARTY NUMBER WITH NON-ASSIGNED NUMBER

Thomas B. London, Tinton Falls, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 3, 1995, Ser. No. 398,251
Int. Cl.[6] H04M *1/56;15/00;3/42;3/00*
U.S. Cl. 379—142 **22 Claims**



15. A system for providing a communications service to a caller, said system comprising:

means for receiving source information which includes a calling party number associated with said call; and

means for replacing said calling party number with a selected non-assigned telephone number.

5,590,185

MULTIPLE PHONE LINE ADAPTOR

Harold Sandler, 18607 Aceituno St., San Diego, Calif. 92128, and Kendy Ip, Rm D, G/F, BLK 6, The Eldorado, Tong Yan San Tsuen, Yuen Long, Hong Kong

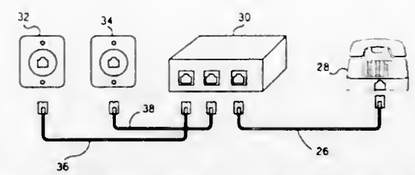
Filed Mar. 25, 1995, Ser. No. 409,225
Int. Cl.[6] H04M *1/00*
U.S. Cl. 379—163 **14 Claims**

1. A multiple line phone adaptor for connection of at least two separate phone lines to a single line phone comprising:

first and second ring detector means for connection respectively to first and second phone lines,

micro controller means connected to said first and second ring detector means,

first and second hold means connected respectively to said first and second phone lines and each hold means connected to said micro controller means;



electronic line selector means for connection to said first and second phone lines, said selector means being connected to said micro controller means and said micro controller means controlling the selection of said first and second phone lines;

off hook detector means for detecting when said single line phone is taken off the hook, and

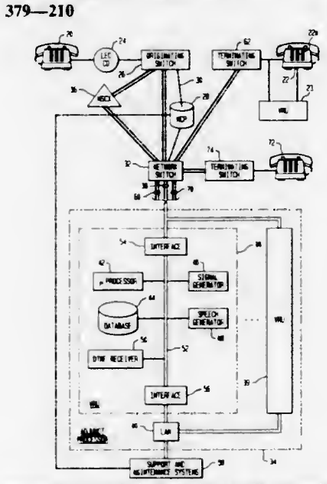
DTMF decoder means connected to said micro controller means and for connection to said single line phone for decoding DTMF command signals from said single line phone.

5,590,186

SYSTEM AND METHOD FOR REDIRECTING A TELEPHONE CALL WITH CALL MERGING

Frank Y. Liao, Howell; Antolnette Rule, Trenton; Rise J. Frankel, Somerset; Thomas W. Blickle, Keyport, all of N.J., and Sandra L. Bish, Thornton, Colo., assignors to AT & T, Holmdel, N.J.

Filed Dec. 22, 1993, Ser. No. 172,374
Int. Cl.[6] H04M *3/42;11/04*
U.S. Cl. 379—210 **39 Claims**



11. A system for completing telephone calls comprising

means including a switch having an associated adjunct processor for routing a call from a calling party at a customer location to a redirecting party at a primary location,

a voice response unit (VRU) positioned at said primary location and including means for receiving and processing dual tone multifrequency (DTMF) instruction signals,

means in said adjunct processor for monitoring the call after it has been completed to said primary location for a redirection signal indicative to forward said call to an alternate destination,

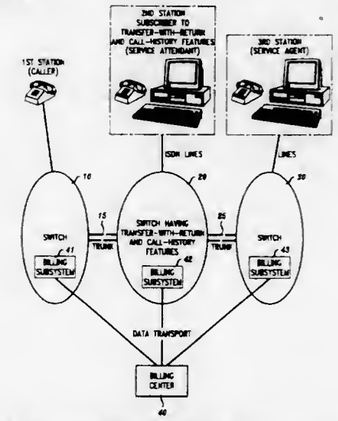
means in said adjunct processor for routing said call from said calling party to said primary location, and including means in said adjunct processor for transmitting to said voice response unit a series of dual tone multifrequency signals indicating the results of the attempted transfer to an alternate destination, so as to enable further, predetermined processing of said call such as transfer to a second alternate location, and including means for releasing said call legs to and from said adjunct processor while merging said call legs within said switch so as to conserve adjunct processor resources for further incoming calls.

5,590,187

CALL TRANSFER WITH AUTOMATIC RETURN

Steven L. Greenspan, Oak Park, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 994,566, Dec. 21, 1992, abandoned. This application Apr. 21, 1995, Ser. No. 427,636
Int. Cl.[6] H04M *3/58*
U.S. Cl. 379—212 **22 Claims**



2. A call processing method comprising:

establishing a connection from a first station to a second station, said connection includes a two way voice communication path between said first station and said second station,

establishing a connection from one of said first and second stations to a third station, said connection includes a two way voice communication path between said one station and said third station, where said one station is for a subscriber to a transfer-with-return feature,

invoking said feature at said one station which establishes a connection between the other of said first and second stations and said third station, said connection includes a two way voice communication path between said other of said first and second stations and said third station,

disconnecting said one station from said connections thereby effecting a call transfer from said one station to said third station, and

automatically establishing a return call connection to said one station in response to a prespecified event occurring at said other station or said third station and without receiving a dialed number for said one station.

5,590,188

RULES-BASED CALL ROUTING

Gary B. Crockett, Plano, Tex., assignor to IEX Corporation, Richardson, Tex.

Continuation of Ser. No. 973,034, Nov. 9, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,934
Int. Cl.[6] H04M *7/00*
U.S. Cl. 379—225 **7 Claims**

1. A method, using a call processor, for selecting which call center among a plurality of call centers in a telephone network is to receive an incoming telephone call, comprising the steps of:

generating a routing plan comprising a set of rules, one or more rules in the set of rules having a conditions portion and an

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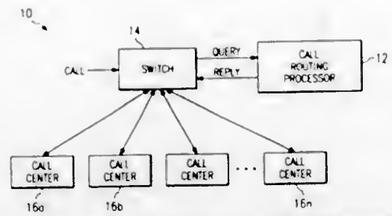


actions portion, the conditions portion of the rule defining one or more call routing conditions and the actions portion defining user selectable destination criteria for biasing an ability of at least one call center relative to the plurality of call centers to be selected to receive the incoming telephone call when the call routing conditions of the rule are met, the user selectable destination criteria including:

(a) when call center answer statistics are available, timing preferences that apply a bias value to an estimated answer delay of the at least one call center of the plurality of call centers to thereby temporally bias the at least one call center relative to one or more call centers of the plurality of call centers;

(b) when call center answer statistics are not available, target routing preferences that apply a bias value to an initial target routing percentage for at least one call center of the plurality of call centers to thereby load bias the target routing percentage of the at least one call center relative to one or more other call centers of the plurality of call centers;

using the set of rules to determine which of the plurality of call centers in the telephone network is to receive the incoming call.

5,590,189

METHOD OF OPERATING A MICROPROCESSOR CONTROLLED TELEPHONE SET

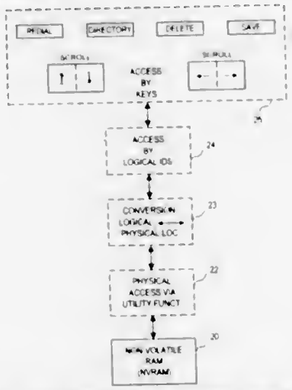
Robert B. Turnbull, Calgary; Kristin J. Travis, Nepean; Piotr T. Goszczynski, Cochrane; Susan J. McGarry, Ottawa, and Michel J. Brisebois, Chelsea, all of Canada, assignors to Northern Telecom Ltd., Montreal, Canada

Filed Dec. 13, 1994, Ser. No. 354,658

Claims priority, application Japan, Dec. 30, 1993, 5-349934

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—356 **5 Claims**



1. A method of operating a microprocessor controlled telephone set having a microcomputer, user-data memory, and a plurality of function-keys, comprising the steps of: storing in said user-data memory a plurality of logical link lists associating records storage areas with each other by storing and updating an index of at least the record number of the first record in use, the record number of the last record in use, the record number of the first record in limbo, the record number of the next record and the record number of the previous record; accessing said user data memory by defining a set of utility functions in a physical access module which reads and writes the memory; translating a logical access request originated by a user of said telephone set to a corresponding utility function; and said logical access request having been generated in response to activation of a function-key

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5,590,190

DATA COMMUNICATION APPARATUS INCLUDING VOLATILE AND NON-VOLATILE STORAGE

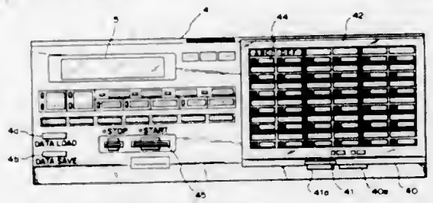
Mitsuhiro Kageyama, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,388, Mar. 3, 1995, abandoned, which is a continuation of Ser. No. 76,928, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 604,166, Oct. 29, 1990, abandoned. This application Mar. 12, 1996, Ser. No. 614,262

Claims priority, application Japan, Oct. 31, 1989, 1-281818; Oct. 31, 1989, 1-281820

Int. Cl.[6] H04M *1/27*

U.S. Cl. 379—356 **112 Claims**



1. A facsimile apparatus comprising:

communication means for communicating image data with a terminal of another party;

a plurality of keys for inputting speed dial telephone numbers;

a volatile memory for storing telephone number information corresponding to the respective speed dial numbers, and capable of being rewritten into;

means for, in accordance with selection of one of the speed dial numbers, reading telephone number information corresponding to the selected speed dial number out of said volatile memory and placing a call based upon the read telephone number information;

a non-volatile storage device for storing image data to be communicated by said communication means;

preserving means for preserving the information and the image data which have been stored in said volatile memory, in said non-volatile storage device, said preserving means preserving the information as a predetermined file name to be distinguishable from other image data stored therein; and

reading means for reading the information, which has been preserved by said preserving means, out of said non-volatile storage device and storing the information into said volatile memory.

5,590,191

REINFORCED PUBLIC TELEPHONE HAVING DUAL KEY PADS

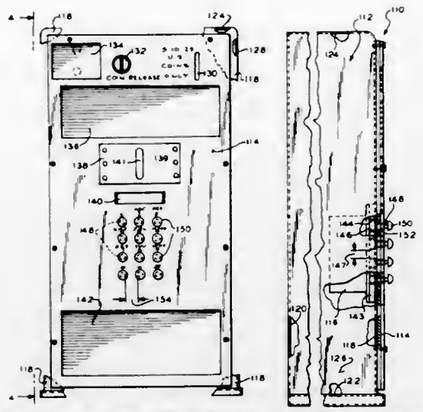
Nelson V. Guevara, Wharton, N.J., assignor to Independent Enclosures, Inc., Wharton, N.J.

Filed Mar. 16, 1995, Ser. No. 406,270

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—451 **12 Claims**

1. In a public telephone comprising a housing having walls, including a front wall; a standard telephone key pad mounted on



the interior of the front wall; said key pad having square actuator keys; said actuator keys having a selective vertical spacing and a selective horizontal spacing for ease of fingertip operation; and a pedestal for holding the public telephone in an upright position for use, a force resistant face plate mounted on the exterior of the front wall covering the key pad to reduce the opportunity to vandalize the telephone; the face plate having a plurality of small round holes corresponding in location with the square actuator keys; each of said holes having associated therewith a rod passing through each hole for contacting the surface of the corresponding square actuator key, the distance between the rods being at least four times the distance between the square actuator keys.

5,590,192

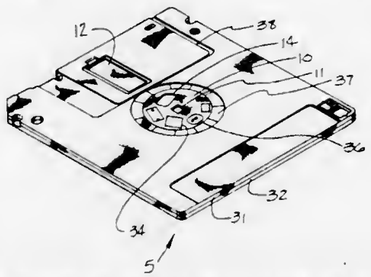
SMART DISK SOFTWARE PROTECTION SYSTEM

Donna M. Lovett, and Robert R. Lovett, both of 1304 S. Linden St., Wichita, Kans. 67207

Filed Nov. 14, 1994, Ser. No. 339,587

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—4 **12 Claims**



1. An electronic data protection device, for protecting any type of electrically transmitted information comprising:

(a) a disk housing, having a top portion and a bottom portion, with the bottom portion defining a circular cavity;

(b) a floppy disk, situated between the top portion and bottom portion of the disk housing, having a mylar disk fixed to a hub, where the hub fits and is able to rotate within the bottom portion circular cavity, and contains a microprocessor, a magnetic field sensor, a power supply for the microprocessor, and a switch to activate the microprocessor;

(c) magnetic field areas, located on the disk housing, so that they are detectable by the magnetic field sensor, when the hub rotates within the bottom portion of the disk housing;

(d) a display means, fixed to the hub.

5,590,193

METHOD TO SECURE THE OPERATIONS FOR ACCESSING DETACHABLE CARDS FOR COMPUTERS

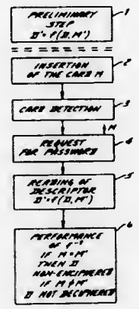
Jean-Yves Le Roux, Ceyreste, France, assignor to Gemplus Card International, Gemenos Cedex, France

Filed May 4, 1995, Ser. No. 434,531

Claims priority, application France, May 5, 1994, 94 05552

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—4 **7 Claims**



1. A method for securing the accessing of a mass storage type card or input-output function type card connected to a computer, these cards comprising a descriptor designed to contain information elements for recognizing the card and its configuration, enabling the computer to use the card for an application,

wherein said method comprises a stage of customization of the card during which at least one information element of the descriptor is enciphered by means of an enciphering function f using a password assigned to one or more authorized users,

wherein during subsequent uses the user presents his password and,

wherein the operating system of the computer activates a reading of the descriptor and the performance of a function f^{-1} for the deciphering of the information elements read in the descriptor on the basis of the password entered by the user so as to determine the enciphered information.

5,590,194

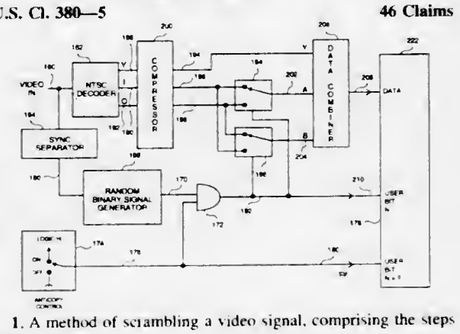
METHOD OF AND APPARATUS FOR SCRAMBLING A VIDEO SIGNAL WITH FULL NETWORK TRANSMISSION AND RECORDING CAPABILITY

John O. Ryan, Cupertino, Calif., assignor to Macrovision Corporation, Sunnyvale, Calif.

Filed Aug. 9, 1994, Ser. No. 287,800

Int. Cl.[6] H04N *7/167*

U.S. Cl. 380—5 **46 Claims**



1. A method of scrambling a video signal, comprising the steps of:

decoding said video signal into a luminance component, a first color component and a second color component;

generating a key signal;

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using a first selector controlled by said key signal to select between said first and second color components;

using a second selector controlled by said key signal to select between said first and second color components, wherein said first selector and said second selector select opposite signals from said first and second color component signals;

coupling said luminance component signal, an output of said first selector and an output of said second selector respectively to a luminance input, a first color input and a second color input of an encoder, thus producing a scrambled color output; and

coupling said key signal to said encoder to combine said key signal said key signal with said key signal.

5,590,195

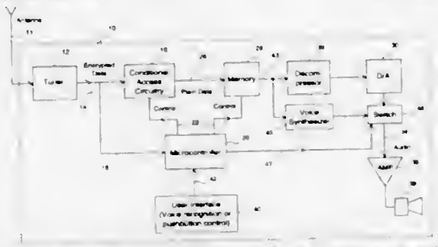
INFORMATION DISSEMINATION USING VARIOUS TRANSMISSION MODES

John O. Ryan, Cupertino, Calif., assignor to Command Audio Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 31,763, Mar. 15, 1993, Pat. No. 5,406,626. This application Jan. 12, 1994, Ser. No. 181,394

Int. Cl.[6] H04L *9/00*; **H04B** *1/06*

U.S. Cl. 380—9 **43 Claims**



36. A system for information dissemination to transmit audio data comprising:

a data producing sub-system for converting analog audio information to digital data and a database with menus;

a data compressor for compressing the encrypted audio data; and

an encryptor for encrypting the digital audio data;

a means for inserting the compressed encrypted digital audio data into a transmission channel;

a tuner means for receiving the transmitted compressed encrypted digital audio data;

a memory means for storing the selected data in the database;

a means for providing a set of menus to a user describing the database, and a means for updating the data in the database;

a controller means for selecting data from the database in response to the accepted selections and providing the selected data in the encrypted compressed digital form; and

a decrypting means for decrypting the encrypted compressed digital audio data;

a decompressing means for decompressing the compressed digital audio data; and

a means for converting the digital audio data to analog audio data representing the audio originally transmitted.

5,590,196

SECURE PAYMENT METHOD USING FACSIMILE

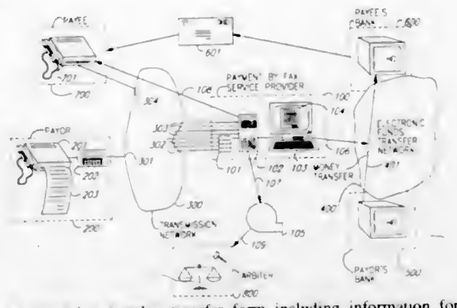
Thierry Moreau, Montreal, Canada, assignor to Connotech Experts Consells Inc., Montreal, Canada

Filed Oct. 6, 1994, Ser. No. 319,041

Int. Cl.[6] H04L *9/00;9/32*

U.S. Cl. 380—18 **23 Claims**

1. A method for transferring economic value from a payer to a payee comprising the steps of:



a) preparing a value transfer form including information for identifying a specific value to be transferred, a financial institution of the payee and an account number of the payee;

b) receiving and verifying a security code at an encryption unit to authorize a transmission including a cryptographic processing result;

c) preparing a facsimile transmission device to send an image of the value transfer form;

d) connecting the facsimile device through the encryption unit over a communication channel to a value transfer service provider;

e) sending said image of the value transfer form in said transmission;

f) receiving at the value transfer service provider said transmission including said cryptographic processing result;

g) sending a confirmation message to said facsimile device that said transmission has been correctly received;

h) decrypting the cryptographic processing result at the value transfer service provider;

i) determining whether the cryptographic processing result was authentically generated by the payer;

j) extracting said identifying information from the facsimile transmission; and

k) generating an electronic value transfer transaction based on said identifying information provided that the cryptographic processing result is determined to be authentic in step (i).

5,590,197

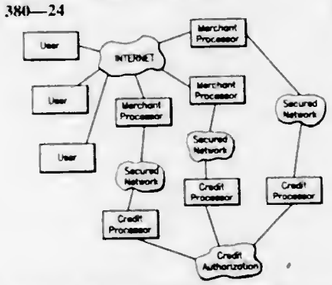
ELECTRONIC PAYMENT SYSTEM AND METHOD

James F. Chen, and Jieh-Shan Wang, both of Potomac, Md., assignors to V-ONE Corporation, Rockville, Md.

Filed Apr. 4, 1995, Ser. No. 416,045

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—24 **12 Claims**



1. An electronic payment system, comprising:

storage means for storing sensitive account information, at least one browser program, and a public key file, said at least one browser program constituting a means for enabling communications with at least one merchant over an open computer network, and said public key file including means for selecting the public key of a private-public key cryptosystem and for encrypting the sensitive information using the public key to generate an authorization ticket;

means possessed by a merchant in communication with the storage means for receiving said authorization ticket from the storage means and forwarding it to a secured account processor;

means in the account processor including a private key for decrypting the authorization ticket and informing the merchant whether a transaction is authorized.

5,590,198

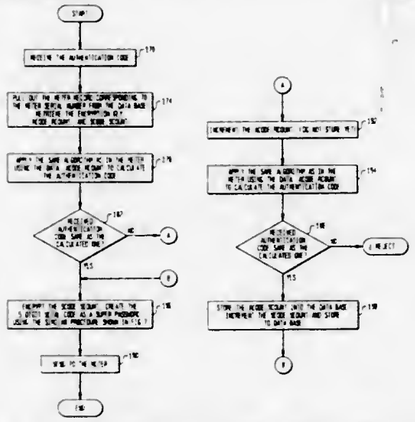
OPEN METERING SYSTEM WITH SUPER PASSWORD VAULT ACCESS

David K. Lee, Monroe, and David W. Riley, Easton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 19, 1995, Ser. No. 574,749

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—21 **10 Claims**



1. A method of reinitializing a user password system in a transaction evidencing device, the method comprising the steps of:

sharing secret data in the transaction evidencing device and in a database at a data center for performing secure communications therebetween, the secret data including at least two counters and an encryption key;

requesting for the transaction evidencing device a super password from the data center;

authenticating at the data center the transaction evidencing device requesting the super password;

issuing a super password from the data center for the authenticated transaction evidencing device;

entering the super password into the transaction evidencing device;

authenticating in the transaction evidencing device the super password entered in the transaction evidencing device; and

resetting the user password in the transaction evidencing device upon verification of the authenticity of the super password.

5,590,199

ELECTRONIC INFORMATION NETWORK USER AUTHENTICATION AND AUTHORIZATION SYSTEM

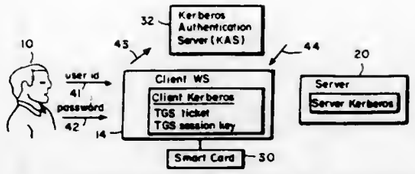
Marjan Krajewski, Jr., Acton; John C. Chipchak, Dracut; David A. Chodorow, Groton; Jonathan T. Trostle, Lexington, and Peter T. Baldwin, Rowley, all of Mass., assignors to The Mitre Corporation, Bedford, Mass.

Filed Oct. 12, 1993, Ser. No. 134,399

Int. Cl.[6] H04L *9/32;9/08*

U.S. Cl. 380—25 **4 Claims**

1. A system for authenticating a user to any service or computer on a heterogenous computer network comprising:



at least one workstation in communication with a network; and

a removable, personally protectable coprocessor adapted to communicate with the workstation,

the coprocessor adapted to receive user-provided initialization information from the workstation,

the coprocessor adapted to receive signals including first encrypted authentication information from the workstation, the coprocessor including a preselected first key to decrypt the first encrypted authentication information, the coprocessor further programmed to assemble second authentication information and to encrypt the second authentication information using at least one of (i) a key contained within the first encrypted authentication information and (ii) a preselected second key and to send the second encrypted authentication information to the network via the workstation,

whereby the user is authenticated to access the networked computer or service.

5,590,200

APPARATUS AND METHOD FOR SECURING COMMUNICATION SYSTEMS

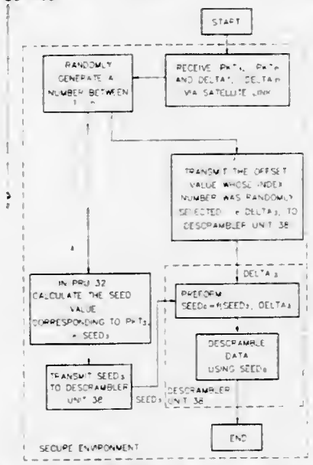
Jacob B. Nachman, Ramat Modiim, and Yossef Tsuria, Jerusalem, both of Israel, assignors to News Datacom Ltd., London, England

Filed Sep. 21, 1994, Ser. No. 309,807

Claims priority, application Israel, Dec. 9, 1993, 107967

Int. Cl.[6] H04L *9/14;9/26*

U.S. Cl. 380—46 **29 Claims**



5. A hacking prevention method for use with a network including a transmitter which transmits information to a multiplicity of subscriber units, wherein each of the multiplicity of subscriber units is independently enabled by a descrambling secret number, and when enabled is responsive to data received from the transmitter for descrambling scrambled information, the method comprising the steps of:

receiving a data stream including a series of authorization packets, and a series of offset values, wherein each offset value in

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said series of offset values is paired with a corresponding authorization packet in said series of authorization packets;

generating a random number integer in the range between one and the total number of packets in said series of authorization packets;

providing a selected packet, wherein said selected packet is a packet having a serial number in the series of authorization packets which is equal to said random number integer;

producing a key which uniquely corresponds to said selected packet; and

generating a descrambling secret number which is the same for all of said multiplicity of subscriber units by utilizing the key with the offset value which is paired with said selected packet, whereby said key and said selected packet intercepted at a first subscriber unit cannot be effective to enable a second subscriber unit.

5,590,201

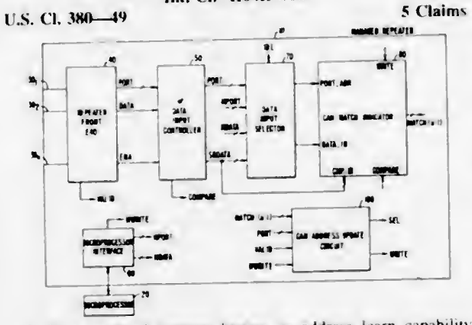
PROGRAMMABLE SOURCE ADDRESS LOCKING MECHANISM FOR SECURE NETWORKS

William Lo, Santa Clara, Calif., assignor to Advanced Micro Devices Inc., Sunnyvale, Calif.

Filed Nov. 10, 1994, Ser. No. 337,634

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—49 **5 Claims**



1. In a managed repeater having an address learn capability wherein receipt at a particular port of a data packet having a received source address different from a stored source address associated with the particular port replaces the stored source address with the received source address, a source address locking circuit, comprising:

a learn mode circuit for the particular port, for replacing the stored source address with the received source address when the stored source address does not match the received source address; and

an address lock register for the particular port, coupled to said learn mode circuit, for storing a bit value to prevent said learn mode circuit from replacing the stored source address with the received source address.

5,590,202

COUNTDOWN SYSTEM FOR CONDITIONAL ACCESS MODULE

Caitlin B. Bestler, Chicago; Harry A. Hartley, III, Palatine, and Khosro M. Rabii, Arlington Heights, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 18, 1995, Ser. No. 375,319

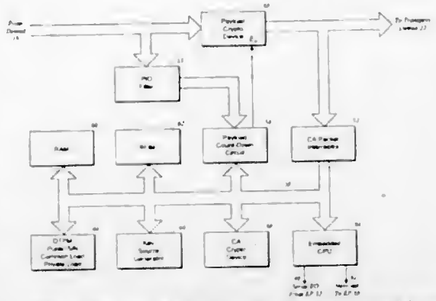
Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—49 **13 Claims**

1. A conditional access system for a subscriber terminal comprising:

means operable for decrypting a received product packet identified by a PID;

means including a PID register and an associated countdown register for enabling said decrypting means in response to the



value of said received PID matching the value stored in said PID register and said associated countdown register having a value other than a first selected value;

means for decrementing said countdown register each time one of said product packets is decrypted; and

means for setting the countdown register to a second selected value in response to a received CA packet.

5,590,203

PILOT SIGNAL DETECTION CIRCUIT

Toshiya Matsui, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Sep. 14, 1994, Ser. No. 306,387

Claims priority, application Japan, Sep. 16, 1993, 5-255163

Int. Cl.[6] H04H *5/00*

U.S. Cl. 381—4 **10 Claims**

1. A pilot signal detection circuit, comprising: extracting means for extracting a carrier of a pilot signal from a received broadcast waves;

reference signal generating means for generating a reference signal having the same frequency as and phase-synchronized with the carrier extracted by the extracting means;

sync-detecting means for sync-detecting the carrier extracted by the extracting means by using the reference signal;

frequency signal generating means for generating a pair of first signals having a frequency assigned for sound multiplex broadcasting and whose phases are different by 90 degrees each other, and a second pair of signals having a frequency assigned for stereophonic broadcasting and whose phases are different by 90 degrees each other;

multiplying means for multiplying a detection signal output from the sync-detecting means by any one of the first pair of signals and the second pair of signals;

squaring means for squaring the output signals from the multiplying means; and

detecting means for detecting the pilot signal in accordance with a sum signal of signals output from the squaring means.

5,590,204

DEVICE FOR REPRODUCING 2-CHANNEL SOUND FIELD AND METHOD THEREFOR

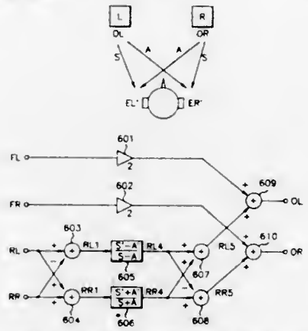
Hee-Soo Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 7, 1992, Ser. No. 987,449

Claims priority, application Rep. of Korea, Dec. 7, 1991, 1991-22376

Int. Cl.[6] H04R *5/00*

U.S. Cl. 381—24 **6 Claims**



2. A sound field reproducing method for a stereo system including a first digital signal processor generating four sound signals, including a first front left sound field signal, a first front right sound field signal, a first rear left sound field signal and a first rear right sound field signal, from two input sound signals, a second digital signal processor combining the four sound signals received from said first digital signal processor into a first channel signal and a second channel signal provided via a stereo amplifier to speakers, said method comprising the steps of:

adding said first rear left sound field signal to said first rear right sound field signal to generate a second rear right sound field signal, and subtracting said first rear left sound field signal from said first rear right sound field signal to generate a second rear left sound field signal;

filtering said second rear left sound field signal and said second rear right sound field signal into a third rear left sound field signal and a third rear right sound field signal, respectively, said third rear left sound field signal and said third rear right sound field signal having transfer characteristics;

adding said third rear left sound field signal to said third rear right sound field signal to generate a fourth rear left sound field signal, and subtracting said third rear left sound field signal from said third rear right sound field signal to generate a fourth rear right sound field signal; and

adding a level-controlled said first front left sound field signal to said fourth rear left sound field signal to generate said first channel signal, and adding a level-controlled said first front right sound field signal to said fourth rear right signal to generate said second channel signal.

5,590,205

ADAPTIVE CONTROL SYSTEM WITH A CORRECTED-PHASE FILTERED ERROR UPDATE

Steven R. Popovich, Stoughton, Wis., assignor to Digisonix, Inc., Middleton, Wis.

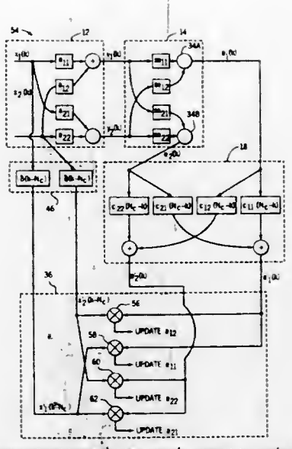
Filed Aug. 25, 1994, Ser. No. 297,241

Int. Cl.[6] G06F *15/00*

U.S. Cl. 381—71 **47 Claims**

1. An adaptive control system having a system input and a system output, the system comprising:

an adaptive filter that inputs one or more reference signals and one or more error input signals, and outputs one or more correction signals;



one or more output transducers, each output transducer inputting one of the correction signals and outputting a control signal that combines with a system input;

one or more error sensors that senses a system output and outputs an error signal;

an error signal filter that inputs each error signal and outputs one or more filtered error signals, wherein the error signal filter includes a delayed Hermitian transpose of a model of an auxiliary path between the output of the adaptive filter and the input of the error signal filter; and,

an error signal correlator that inputs each reference signal and each filtered error signal and outputs the one or more error input signals.

5,590,206

NOISE CANCELER

Hyeong-keon An; Young-ho Shin, and Suk-ki Kim, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

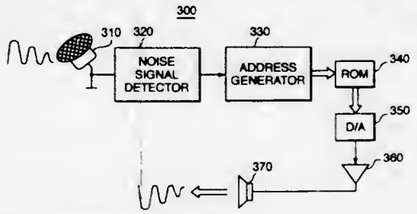
Division of Ser. No. 45,011, Apr. 9, 1993, Pat. No. 5,406,149.

This application Oct. 21, 1994, Ser. No. 326,954

Claims priority, application Rep. of Korea, Apr. 9, 1992, 92-5927

Int. Cl.[6] H04B *29/00;15/00;* **A61F** *11/06*

U.S. Cl. 381—71 **4 Claims**



1. A noise canceler, comprising:

a noise detector;

an address sequencer connected to the noise detector;

a memory connected to the address sequencer, said memory storing predetermined inverted digitized noise patterns and regenerating the predetermined inverted digitized noise patterns in response to the address sequencer;

a D/A converter receiving said predetermined inverted digitized noise patterns from the memory and converting said predetermined inverted digitized noise patterns into analog form;

a speaker connected to the D/A converter and generating inverse noise signals.

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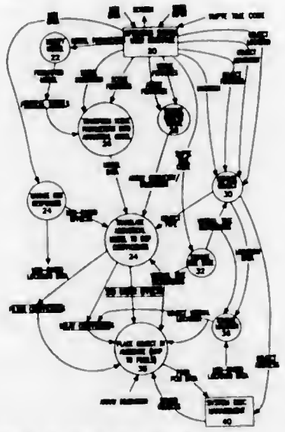
5,590,207

SOUND REPRODUCING ARRAY PROCESSOR SYSTEM

Stephen F. Taylor, Pacific Palisades, Calif., assignor to Taylor Group of Companies, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 166,463, Dec. 14, 1993. This application May 17, 1994, Ser. No. 245,160
Int. Cl.[6] H04R *1/02*
U.S. Cl. 381—90 **21 Claims**



1. An acoustical modeling and playback system, comprising:

(a) a computer comprising: (1) means for modeling acoustical properties of a three dimensional space, (2) means for placing and moving a propagating acoustical energy source in the three dimensional space, (3) means for modeling acoustical characteristics of the propagating acoustical energy source as it is placed and moved in the three dimensional space, (4) means for modeling an intersection of the propagating acoustical energy source with a surface in the three dimensional space, (5) means for translating the modeled acoustical properties, the modeled acoustical characteristics, and the modeled intersection into a plurality of data streams, and (6) means for storing the data streams on a data storage device; and

(b) a playback system, coupled to the data storage device, the playback system comprising: (1) a plurality of sound pixels, each comprising addressable transducers for generating acoustical energy, (2) means for retrieving at least one data stream from the data storage device, (3) means for transmitting each of the data streams to specific sound pixels, and (4) means for operating the sound pixels as directed by the data streams to recreate the modeled acoustical properties, the modeled acoustical characteristics, and the modeled intersection.

5,590,208

SPEAKER SYSTEM

Shinji Koyano; Koushirou Kogure; Takashi Ohyaba; Makoto Sakakibara, and Katsutoki Hanayama, all of Saitama-ken, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

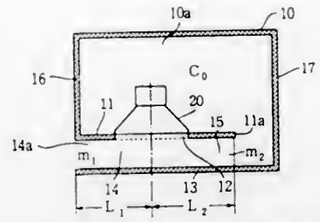
Filed Apr. 11, 1995, Ser. No. 419,902
Claims priority, application Japan, Apr. 18, 1994, 6-079057
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—154 **6 Claims**

1. A speaker system comprising:

a cabinet,

a first speaker unit provided within the cabinet; and

a duct for radiating sound pressure emitted from the first speaker unit,



wherein a drive signal to be applied to the speaker unit is passed through a network circuit means, said network circuit means for eliminating a high frequency component contained in the drive signal,

wherein the duct extends in a direction perpendicular to a radiating direction of the sound pressure radiated from a front side of the first speaker unit, with one end of the duct being communicated with a space of the cabinet, and another end of the duct forming an opening of the speaker system;

wherein the first speaker unit is disposed with the front side thereof positioned at a portion of a wall of the duct;

wherein the duct has a cross section which is perpendicular to a sound propagating direction and has a consistent cross sectional area along an entire length thereof; and

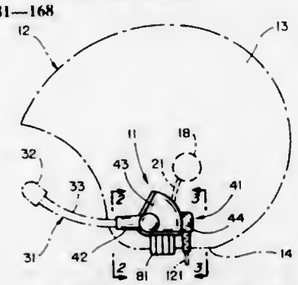
wherein sound pressure radiated from a rear side of the first speaker unit is propagated in the duct and applied to the sound pressure from the front side of the first speaker unit, and combined sound pressure is discharged outwardly from the duct.

5,590,209

MOUNT FOR SUPPORTING A MICROPHONE ON A HELMET

David S. Pratt, San Jose; Philip Bourgeois, Woodside; Edward J. Cornelius, III, San Francisco; Chin H. Lee, Palo Alto, and Blaise G. Stoltenberg, Oakland, all of Calif., assignors to Setcom Corporation, Mountain View, Calif.

Filed Jul. 22, 1994, Ser. No. 279,282
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—168 **21 Claims**



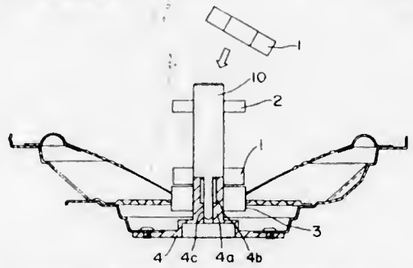
1. A microphone mount assembly for use with a motorcycle helmet having a hardened outer shell and with a transmission cable carrying electrical conductors, comprising a mount having a front and rear and a front profile which includes opposite inner and outer surfaces, the inner surface having a contour which conforms to the outer shell of the helmet prior to being mounted on said helmet and the outer surface being generally smooth and free of projections, a cylindrical boom member having first and second end portions, a microphone mounted on the first end portion of the boom member, a sleeve-like member extending from the front of the mount in a forward direction within the front profile for receiving the second end portion of the boom member and directing the boom member forwardly so that the microphone is disposed in front of the helmet, receiving means extending from the rear of the mount adapted for receiving the transmission cable and means adapted to secure the mount to the helmet consisting of a layer of an adhesive material carried by the inner surface for fastening the mount to the outer shell of the helmet whereby the layer of adhesive material permits the fastening of the mount to the helmet without impairing the structural integrity of the helmet and whereby the generally smooth outer surface, the sleeve-like member extending from the front of the mount within the front profile and the receiving means extending from the rear of the mount minimize undesirable wind noise during use of the microphone mount assembly on a helmet.

5,590,210

LOUDSPEAKER STRUCTURE AND METHOD OF ASSEMBLING LOUDSPEAKER

Shinta Matsuo, Kokubunji, and Yoshio Sakamoto, Hachioji, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation of Ser. No. 223,968, Apr. 6, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 517,352
Claims priority, application Japan, Apr. 9, 1993, 5-107367
Int. Cl.[6] H04R *25/00;31/00*
U.S. Cl. 381—199 **1 Claim**



1. A method of assembling a loudspeaker comprising:

preparing first and second disc-like magnets which have been magnetized in their axial directions and a disc-like plate of magnetic material which is not magnetized, each of the first and second magnets and the plate being provided with an aperture in its center;

preparing a holder for holding magnetic circuit components of said first and second magnets and said plate;

standing up a jig shaft on a said holder, the diameter of the jig shaft being slightly smaller than that of the aperture in said first and second magnets and said plate and the length of the jig shaft being sufficiently long so that the magnetic field at the upper end of the standing jig shaft produced by the first magnet mounted on the holder is sufficiently weak so as not to disturb manipulation of the second magnet;

sequentially disposing said first magnet and said plate in a semi-stack on said holder so that said jig shaft passes through the apertures of said first magnet and said plate;

after setting the semi-stack of said first magnet and said plate on said holder, further disposing said second magnet in a stack on said holder so that said jig shaft passes through the apertures of said first magnet, said plate and said second magnet; and

removing said jig shaft from said holder and then fixing the magnetic circuit components in the stack by screw means,

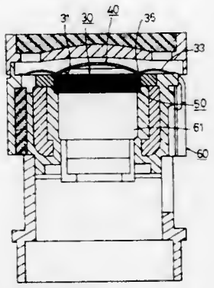
wherein said holder or said screw means has an axial shaft which extends through the apertures of said first and second magnets and said plate and the same magnetic polarity ends of said first and second magnets are disposed to face each other to generate a repulsive magnetic field.

5,590,211

MICROPHONE

Ching-Lu Chang, No. 39, Lane 29, Shih-Chia Rd., Tung Dist., Taichung City, Taiwan

Filed Jul. 14, 1995, Ser. No. 502,070
Int. Cl.[6] H04R *25/00;7/00;* **H05K** *5/00*
U.S. Cl. 381—193 **4 Claims**



1. A microphone comprising:

a housing having an opening on an upper end thereof;

a magnet mounted inside said opening and having two opposite poles, said magnet generating a magnetic field between said opposite poles;

a voice coil disposed movably in said magnetic field;

a diaphragm spread over said opening and attached to said upper end of said housing at a peripheral portion thereof, said diaphragm having a central convex portion dimensionally matching perimeter of said voice coil, said central convex portion having a concentric cutout portion, said diaphragm further having an annular convex portion encircling said central convex portion and forming an annular juncture with said central convex portion, said annular juncture being attached to said voice coil so that said voice coil will move in said magnetic field by virtue of movement of said diaphragm in response to compression and rarefaction of sound waves; and

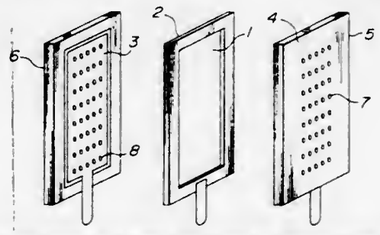
a membrane made of a material more rigid than said diaphragm, said membrane covering said cutout portion and extending to said annular juncture, said membrane being connected to said central convex portion only at said annular juncture.

5,590,212

DIAPHRAGM FOR A CAPACITANCE TYPE LOUDSPEAKER

Masaru Uryu, Chiba; Kunihiko Tokura, Saitama; Ikuo Chatani, Kanagawa; Ikuo Mizoguchi, and Mamoru Ito, both of Tochigi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,633
Claims priority, application Japan, Jul. 30, 1993, 5-190147
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—191 **8 Claims**



1. A diaphragm for a capacitance type loudspeaker comprising:

a base film having a thickness of 25 μm or less, and a conductive polymer layer disposed on said base film, the conductive polymer layer having a thickness of from about 0.04% to

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about 5% of the base film thickness and having a surface resistivity of from about 1×10^{4} to about 1×10^{10} ohms per square, and being formed by soaking the base film in an aqueous solution comprising a conductive high molecular monomer, a chemical oxidizer and a dopant in the absence of a resin binder.

5,590,213

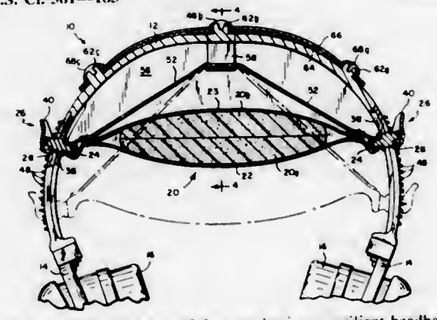
HEADSET WITH ADJUSTABLE HEADPAD

Richard M. Urella, Charlton, and Glen A. Davis, Leominster, both of Mass., assignors to David Clark Company Inc., Worcester, Mass.

Filed Feb. 15, 1995, Ser. No. 388,740

Int. Cl.[6] H04R *25/00*

U.S. Cl. 381—183 **7 Claims**



5. For use in a headset of the type having a resilient headband with a bridge portion configured to overlie a user's head and leg portions extending from said bridge portion to stirrups carrying earcups configured and dimensioned to enclose a user's ears, an adjustable headpad assembly comprising:

slide members carried on and moveable along said leg portions;

a cushioning element extending between said leg portions and connected at opposite ends to said slide members;

securing means associated with said slide members and said leg portions, said securing means being operative to accommodate movement of said slide members along said leg portions to selected positions of adjustment, and to secure said slide members at said positions; and

headpad biasing means for resiliently urging said slide members towards the bridge portion of said headband, said headpad biasing means including an elastomeric sheath enclosing said cushioning element and said bridge portion.

5,590,214

VERTICAL ARRAY TYPE SPEAKER SYSTEM

Hisatsugu Nakamura, 13-3-1001 Roppongi 5-Chome, Minato-ku Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 326,878

Claims priority, application Japan, Nov. 12, 1993, 5-307445

Int. Cl.[6] H04R *25/00*; **H05K** *5/00*

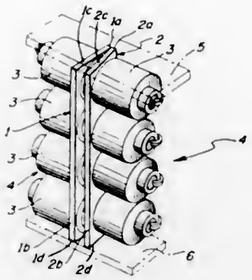
U.S. Cl. 381—182 **20 Claims**

1. A vertical array type speaker system comprising:

a pair of adjustable symmetrically opposed baffle boards having front and rear edges;

an array of small diameter speakers mounted on each of said pair of adjustable symmetrically opposed baffle boards so as to be positioned face to face;

the rear edges of said pair of adjustable symmetrically opposed baffle boards being sealingly held together, whereas the front edges of said pair of adjustable symmetrically opposed baffle boards are held apart by top and bottom boards to form a V-shaped chamber having a narrow slot-like opening with a predetermined width.



5,590,215

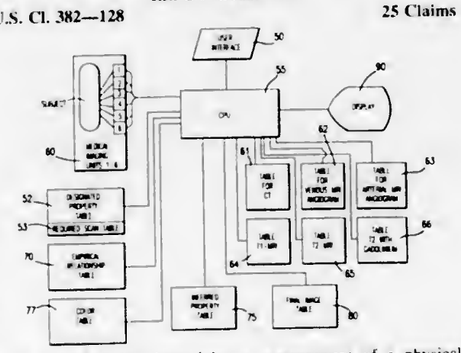
METHOD FOR PROVIDING MEDICAL IMAGES

George S. Allen, 628 Westview Ave., Nashville, Tenn. 37205

Continuation of Ser. No. 136,183, Oct. 15, 1993, abandoned. This application Apr. 21, 1995, Ser. No. 427,634

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—128 **25 Claims**



1. A method for determining a measurement of a physical property of interest associated with the discrete spatial locations of a three dimensional object, wherein each spatial location of the three dimensional object has a unique address, and wherein the three dimensional object is composed of a plurality of types of matter, each type of matter having at least two properties, comprising the steps of:

generating a first set of data reflective of at least a first physical property accessible by a first imaging technique and scanner for each spatial location of the area of interest;

generating a second set of data reflective of at least a second physical property accessible by a second, different imaging technique and scanner for each spatial location of the area of interest;

storing the data generated by the first and second imaging techniques in a memory storage device along with the address of each spatial location; and

assigning to each unique address a first value, said first value representing the measurement of said property of interest for each unique address, said first value based on a correlation between said property of interest with the measure of the first physical property obtained in the first imaging scan taken and the correlation between said property of interest with the measure of the second physical property obtained in the second imaging scan taken, such that said property of interest is different from said first and second physical properties.

5,590,216

Patent Not Issued For This Number

5,590,217

VEHICLE ACTIVITY MEASURING APPARATUS

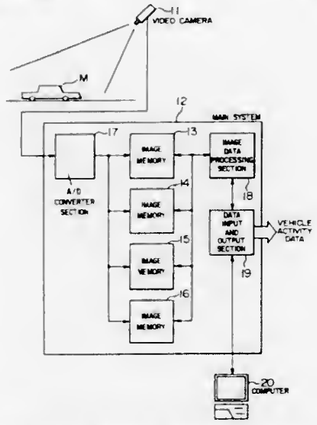
Masakazu Toyama, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 862,426, Apr. 2, 1992, abandoned. This application Jul. 6, 1994, Ser. No. 272,377

Claims priority, application Japan, Apr. 8, 1991, 3-075024; Apr. 8, 1991, 3-075026; Apr. 12, 1991, 3-079587; Apr. 16, 1991, 3-083892

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—104 **13 Claims**



1. A vehicle activity measuring apparatus comprising:

a video camera for picking up an image of a road, on which a vehicle is traveling, and a background image of the road on which no vehicle is traveling, and for outputting the image of the road every frame and the background image of the road;

a first storage means for storing the images to the road for a predetermined number of frames and the background image of the road;

image processing means for extracting the vehicle which is traveling on the road based on the image of the road and the background image of the road, both of which are stored in the first storage means, to produce vehicle information on the extracted vehicle, every frame, and for assigning an identification number to the vehicle information when the vehicle is extracted for the first time, the vehicle information containing position information of the extracted vehicle;

a second storage means for storing the vehicle information in a storage area identified by the identification number; and

a computer for calculating an instantaneous vehicle speed of the extracted vehicle based on the position information contained in the vehicle information stored in the second storage means and then weighing the instantaneous vehicle speed, every frame, and for calculating a vehicle speed of the extracted vehicle based on an average of the weighted instantaneous vehicle speeds over the predetermined number of frames.

5,590,218

UNSUPERVISED NEURAL NETWORK CLASSIFICATION WITH BACK PROPAGATION

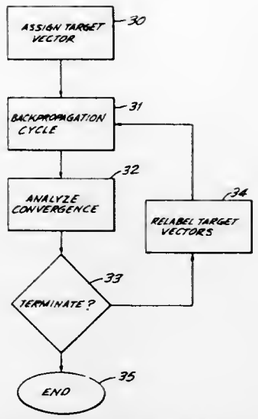
Leonard Ornstein, White Plains, N.Y., assignor to Bayer Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 139,396, Oct. 18, 1993, Pat. No. 5,444,796. This application Jun. 7, 1995, Ser. No. 481,108

Int. Cl.[6] G06K *9/62*

U.S. Cl. 382—157 **23 Claims**

1. A method for training a neural network model running on a computer system to generate classifications from a training sample set, said neural network model representing a neural network



having an input layer an output layer and at least one hidden layer between the input layer and the output layer wherein each layer includes at least one node and wherein each connection between two nodes of successive layers is characterized by an internal weight, said method comprising the steps of:

(a) arbitrarily assigning a numeric label to each training sample signal of a training sample signal set as a target vector signal for an output vector signal for classification, said numeric label selected from a set comprising a plurality of values;

(b) executing a back propagation-like training run by cycling through said training sample set, presenting each said training sample signal to an input of said model, the input representing said input layer, thereby generating said output vector signal for each said training sample signal, and modifying internal weight signals representing said internal weights based on the differences between said output vector signals and their corresponding target vector signals;

(c) estimating the convergence of components of said output vector signal towards respective components of said target vector signal;

(d) permuting said components of each said target vector signal according to said convergence, thereby updating said target vector signals;

(e) repeating steps (b), (c), and (d) until a predetermined condition is satisfied, thereby generating a final set of said internal weight signals to be used with said neural network model or said neural network for future classifications.

5,590,219

METHOD AND APPARATUS FOR RECOGNIZING GESTURES ON A COMPUTER SYSTEM

Arnaud P. J. Gourdol, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 130,074, Sep. 30, 1993. This application Mar. 16, 1995, Ser. No. 405,542

Int. Cl.[6] G06K *9/46*

U.S. Cl. 382—202 **27 Claims**

1. A method for recognizing a gesture input on a display screen for a computer system, the method comprising the steps of:

receiving a stroke input by a user onto a computer screen, the stroke being represented as a string of points;

smoothing said stroke by reducing the number of points that represent the stroke such that the points of the smoothed stroke are located at least a threshold distance apart from one another;

calculating angles between adjacent segments of said smoothed stroke and calculating derivatives of said angles; and

determining whether said stroke substantially represents an ellipse, the ellipse determining step utilizing said angles and said derivatives of said angles to determine whether said

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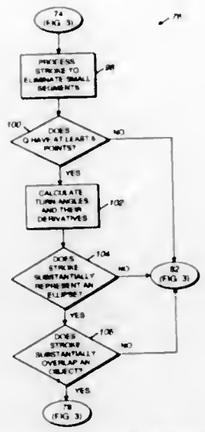


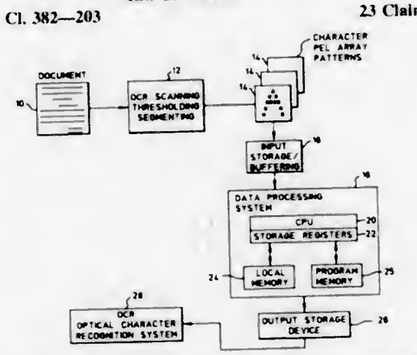
stroke substantially curves in one direction or curves in more than one direction, wherein said stroke is not considered to substantially represent an ellipse when said stroke does not curve in one direction, and summing said derivatives of said angles and checking whether said sum is within a predetermined range of values, wherein said stroke is not considered to substantially represent an ellipse when said sum is outside said range of values.

5,590,220

BENDING POINT EXTRACTION METHOD FOR OPTICAL CHARACTER RECOGNITION SYSTEM

Hiroyasu Takahashi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1992, Ser. No. 928,818
Int. Cl.[6] G06K *9/46*
U.S. Cl. 382—203 **23 Claims**



1. A computer-implemented bending point extraction method for selectively identifying bending points in a character image and generating a corresponding data set for use as input to an optical character recognition procedure that identifies the character image, the bending point extraction method comprising the steps of:

inputting a picture element (PEL) array pattern of black and white picture elements representing a character image to be recognized, the PEL array pattern including a plurality of array positions representing continuous contours of the character image;

scanning the PEL array pattern to trace one or more continuous contours of the character image and generating a list of contour points for each traced contour;

determining for each contour point an acuteness value representing an angle of contour curvature and generating a list of acuteness values for each traced contour;

separating each acuteness list into contour groups, each contour group having a series of a consecutive points that are either all convex or all concave in curvature;

selecting one or more heuristically determined parameters for use in identifying bending points to be extracted;

identifying contour groups having potential bending points therein using at least one of said heuristically determined parameters and

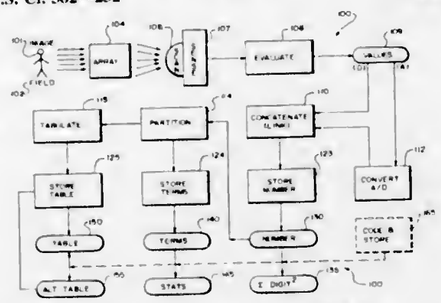
extracting selected bending points from one or more of said identified contour groups using at least one of said heuristically determined parameters in one or more iterations, said parameters defining one or more contour group properties and having different values in successive iterations to identify bending points that meet or exceed the threshold values imposed by the heuristically determined parameters and which are of different significance relative to the optical character recognition procedure.

5,590,221

IMAGING METHOD AND SYSTEM CONCATENATING IMAGE DATA VALUES TO FORM AN INTEGER, AND PARTITIONING THE INTEGER

Dale C. Newton, 986 Cobblestone Dr., Orange Park, Fla. 32073

Filed Mar. 30, 1994, Ser. Nn. 219,827
Int. Cl.[6] G06T *9/00*
U.S. Cl. 382—232 **22 Claims**



1. An imaging system, comprising the combination of

scanning means adapted to scan an image field as an array of image pixels in a preselected order, the image pixels having a characteristic adapted to be evaluated numerically;

evaluative means adapted to evaluate the given characteristic of each of the pixels, in the scanned order, to produce at least one set of successive numerical image data values;

linking means adapted to concatenate each set of numerical image data values into a single corresponding linked image data integral number;

partition means adapted to partition each linked image data integral number into at least one image partition set of numerical terms summing to that number, any numerical partition term being present only once within any single resulting partition set; and

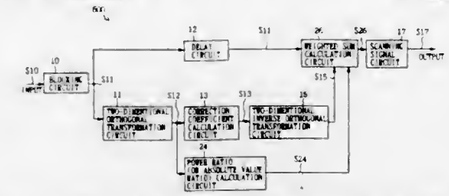
storage means adapted to store foregoing numerical data representing said at least one image partition set of numerical terms, pending subsequent retrieval thereof and consequent image replication.

5,590,222

IMAGE SIGNAL PROCESSING APPARATUS UTILIZING A 2D HAAR TRANSFORM AND ADAPTIVE SELECTION OF IMAGES BASED ON A PARAMETER SUCH AS A RATIO OF COEFFICIENTS FOR REDUCING BLOCK DISTORTION AND METHOD THEREOF

Yuichi Kojima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 339,002
Claims priority, application Japan, Nov. 15, 1993, 5-308730
Int. Cl.[6] G06K *9/40*
U.S. Cl. 382—268 **8 Claims**



1. A method for processing a restored image signal having distortions obtained by decoding coded data by utilizing a two-dimensional inverse orthogonal transformation, said coded data obtained by coding an image signal by utilizing a two-dimensional orthogonal transformation, said method comprising the steps of:

constructing a correction block having pixels of four coded blocks which are adjacent to one another and having a distortion;

performing two-dimensional orthogonal transformation in units of said correction block by utilizing a Haar function so as to form a plurality of coefficients including higher-order side coefficients, three lower-order side coefficients and a dc coefficient;

calculating a ratio of one of a power sum and absolute value sum of said three lower-order side coefficients to a corresponding one of a power sum and absolute value sum of the coefficients other than said dc coefficient and said three lower-order side coefficients;

adding a correction value to said higher-order side coefficients in accordance with said three lower-order side coefficients after the coefficients other than said dc coefficient and said three lower-order side coefficients have been made zero so as to form a correction coefficient signal;

performing two-dimensional inverse orthogonal transformation on said correction coefficient signal in units of said correction block by utilizing the Haar function so as to generate a smoothed image signal in which step-shaped distortions on the boundaries of said coded blocks have been smoothed; and

combining together said restored image signal and said smoothed image signal in accordance with said ratio so as to obtain an image signal in which the distortions on the boundaries of the coded blocks have been substantially eliminated.

5,590,223

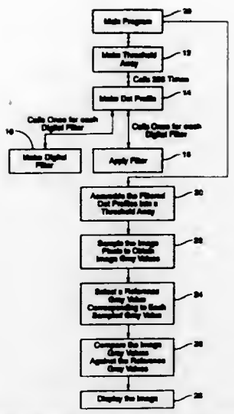
METHOD OF GENERATING A THRESHOLD ARRAY

Stephen N. Schiller, Hayward, Calif., assignor to Adobe Systems Incorporated, Mountain View, Calif.

Filed Apr. 29, 1994, Ser. No. 236,493
Int. Cl.[6] H04N *1/40;* **G06K** *9/38;9/40*
U.S. Cl. 382—270 **6 Claims**

1. A method of displaying on a digital display device an image made up of a plurality of pixels, each having a particular color, using a threshold array made up of a plurality of dot profiles, the dot profiles being made up of a plurality of black or white pixels, certain of the pixels in certain of the dot profiles being constrained to be either black or white, comprising the following steps:

(1) assigning a value to each unconstrained pixel of one of the dot profiles, each such value being interpretable as one of the two colors black or white;



(2) based upon whether a function of the values of the pixels within a predetermined area of the dot profile is different from a predetermined desired value, adjusting the value assigned to a particular pixel within the predetermined area such that in some instances, the adjusted value is interpretable as the other of the two colors; and

(3) repeating step (2) for additional predetermined areas of the dot profile until the entire dot profile has been covered;

(4) repeating steps (1) through (3) for each of the dot profiles in the threshold array, whereby the resulting dot profiles are substantially free of artifacts;

(5) assembling the filtered dot profiles into a threshold array made up of a set of reference gray values;

(6) sampling the image to be reproduced at each pixel of the display device to obtain an image gray value;

(7) selecting a reference gray value for that pixel from the threshold array corresponding to the sampled image gray value for that pixel;

(8) comparing the image gray value for that pixel against the reference gray value for that pixel to obtain the color of the pixel to be displayed;

(9) displaying an image on the digital display device, including each of the pixels with the color determined by the comparison of step (8).

5,590,224

OCR IMAGE PREPROCESSING METHOD FOR IMAGE ENHANCEMENT OF SCANNED DOCUMENTS BY CORRECTION OF REGISTRATION

Bruce B. Fast, 2600 Prindle Rd., Belmont, Calif. 94402, and Dana R. Allen, 1745 Hunt Dr., Burlingame, Calif. 94010

Division of Ser. No. 963,051, Oct. 19, 1992, abandoned. This application May 22, 1995, Ser. No. 447,191
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—291 **3 Claims**

1. A scanned document image enhancement process for determining a horizontal scan line as a top registration reference scan line and a vertical pixel column as a left margin registration reference pixel column of said image, said image having scan lines including a top most scan line and pixel columns including a leftmost pixel column, said process including the steps of

starting at said topmost scan line totaling scan line wise black horizontal run length values, and

starting at said left most pixel column totaling pixel column wise black vertical run length values,

determining a lowest accumulated vertical run length value and a lowest accumulated horizontal black run-length value, detecting on successive ones of said scan lines an increase in

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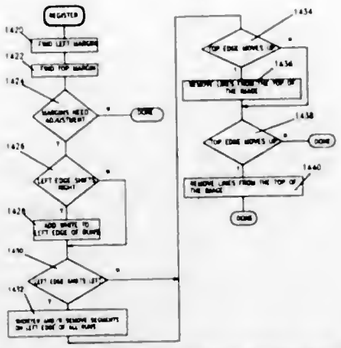


said accumulated horizontal black run-length values over said lowest horizontal black run-length value by a predetermined first factor,

checking that over a predetermined number of said scan lines the accumulated black run-length values exceed said lowest horizontal run-length value by said predetermined factor, and selecting the next one of said scan lines to be said top registration reference scan line,

detecting for on successive ones of said pixel columns an increase in accumulated vertical black run-length values over said lowest vertical black run-length value by a predetermined factor,

checking that over a predetermined number of said pixel columns the accumulated black run-length values exceed said lowest vertical run-length value by said predetermined factor, and selecting the next one of said pixel columns to be said left margin registration scan line.

5,590,225

PLASTIC HOLDER FOR BEARING

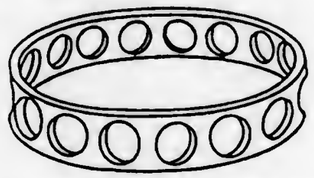
Teruo Aramaki, Kawakura, and Magnzo Hamamoto, Zama, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 26,174, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 752,178, Aug. 23, 1991, abandoned, which is a continuation of Ser. No. 497,739, Mar. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 309,725, Jan. 30, 1989, abandoned. This application Apr. 29, 1994, Ser. No. 235,226

Claims priority, application Japan, Jun. 4, 1987, 62-138997; Feb. 3, 1988, 63-021836

Int. Cl.[6] F16C *33/56*

U.S. Cl. 384—527 **5 Claims**



1. A plastic retainer for rolling elements, which is made from a linear-chain polyphenylene sulfide resin composition comprising linear-chain polyphenylene sulfide resin having a fused viscosity, which is used as an index of molecular weight, of at least 700 poise when measured at 310° C. with a shearing rate of 200 sec^{-1}, and glass fibers in an amount of 0 to 45 weight %.

5,590,226

INTEGRATED OPTICAL BRANCHING ARRANGEMENT AND METHOD USING SAME

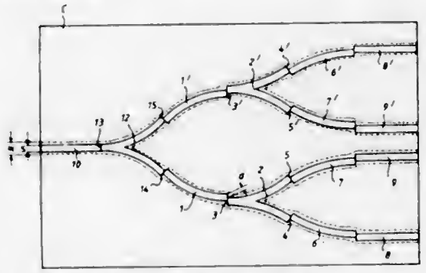
Barbara Wolf, Kronau, and Norbert Fabricius, Hockenheim, both of Germany, assignors to IOT Integrierte Optik GmbH, Jena

Filed May 15, 1995, Ser. No. 441,463

Claims priority, application Germany, May 20, 1994, 44 17 698.8; European Pat. Off., Feb. 24, 1995, 95102653

Int. Cl.[6] G02B *6/26;* **H01L** *21/70*

U.S. Cl. 385—45 **15 Claims**



1. An integrated optical device comprising:

at least one Y-branch waveguide;

a plurality of monomode waveguides;

said monomode waveguides being optically connected to said Y-branch waveguide;

at least one of said monomode waveguides and said Y-branch waveguide conjointly defining an abutting junction having a lateral offset (d);

said one Y-branch waveguide having an input end and two output ends;

said input end having an input cross section and each of said two output ends having a cross section; and,

all of said cross sections being equal to each other.

8. A method of making an integrated optical device which includes at least one Y-branch waveguide and a plurality of monomode waveguides, each two mutually abutting ones of said waveguides defining a junction, the method comprising the steps of:

providing a lithographic mask having a line structure formed therein defining said waveguides and having abrupt lateral offsets (d) at selected ones of the junctions;

applying said lithographic mask to a substrate; and,

generating said waveguides in said carrier with an ion exchange.

5,590,227

OPTICAL CONNECTOR APPARATUS

Keiji Osaka; Takeo Komiya; Yasuo Asano; Tomomi Sano, all of Kanagawa; Hidetoshi Takasugi, and Kazuhiko Arimoto, both of Tokyo, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka; Nippon Telegraph Telephone Corp., and Sumiden Opcom Ltd., both of Tokyo, all of Japan

Division of Ser. No. 222,007, Apr. 4, 1994, Pat. No. 5,418,872, which is a continuation of Ser. No. 977,961, Nov. 18, 1992, abandoned. This application Aug. 31, 1994, Ser. No. 298,833

Claims priority, application Japan, Nov. 18, 1991, 3-301710; Feb. 18, 1992, 4-030514

Int. Cl.[6] G02B *6/36*

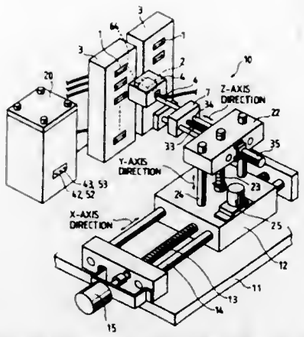
U.S. Cl. 385—53 **3 Claims**

1. An optical connecting apparatus comprising:

a plurality of first optical connectors fixedly supported on a body of said apparatus;

a second optical connector movably supported on the apparatus body, said second optical connector being moved to be connected to any one of said first optical connectors; and

a matching agent coating mechanism, provided in opposed relation to a connecting surface of said second optical connector,



for applying a matching agent, which improves optical connection characteristics, to said second optical connector,

wherein an optical path is switched by a connection of said optical connectors,

wherein said matching agent coating mechanism includes a tank for holding the matching agent, an introduction passage for feeding the matching agent from said tank, a valve provided in said introduction passage for opening and closing said introduction passage, and an opening/closing member which opens said valve upon insertion of a guide pin which positions said second optical connector.

5,590,228

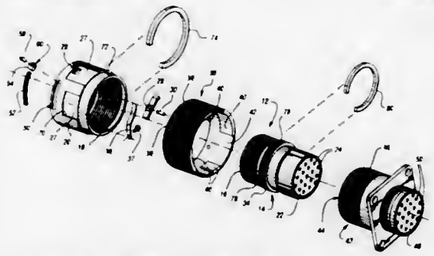
RATCHET LOCK CONNECTOR INTERLOCKING MECHANISM

Norbert Gibola, Canyon Country, and Mehrad Ghara, Tarzana, both of Calif., assignors to Packard Hughes Interconnect Company, Irvine, Calif.

Filed Sep. 8, 1995, Ser. No. 525,471

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—56 **3 Claims**



1. A ratchet lock connector comprising:

a receptacle mating component having an outwardly extending nipple and a socket defined therein, a first communication line having a connector on a free end and the line carried by the receptacle mating component and extending into said socket, and threads formed on an outer surface of said nipple;

a cylindrical-shaped plug housing having a first end constructed and arranged to be received in said socket, said plug housing carrying a second communication line having a connector thereon for engagement with the connector on said first communication line, said plug housing having a plurality of teeth formed on an annular outer surface of the plug housing, said teeth being sloped in one direction;

an inner coupling ring being received on said housing, said inner coupling ring having an inner wall with threads formed thereon complementary to the threads formed on said nipple and said threads being spaced a distance from said plug housing, said inner coupling ring having keyways formed therethrough in an annular direction, a ratchet arm pivotally carried by said inner coupling ring so that a first end of the arm may be pivoted into a keyway and a second end of the arm pivoted towards the center axis of the inner coupling ring, said ratchet arm having a pawl extending from one end thereof for engaging the teeth on the plug housing;

an outer ring actuator having a plurality of keys formed along an inside wall of the outer ring actuator, each key extending into a respective keyway formed in the inner coupling ring; said inner coupling ring having a spring attached to the inside wall thereof and engaging said second end of the ratchet arm to bias said pawl towards the center axis of the inner coupling ring and towards the teeth on said plug housing;

wherein said plug housing and said receptacle mating component may be mated by bringing said plug housing and receptacle mating component together and turning the outer ring actuator in a clockwise direction causing said keys to engage the inner coupling ring and turning the inner coupling ring in the same direction causing the plug housing and the receptacle mating component to be threaded together and said first and second communication lines to be mated, and so that the pawl slides over the sloped edge of the teeth on the plug housing as the inner coupling ring is rotated in the clockwise direction;

and wherein said plug housing and receptacle mating component may be unmated by turning the outer ring actuator in a counterclockwise direction so that one of said keys engages the first end of the ratchet arm forcing it downward towards the center of the inner coupling ring causing the second end of the ratchet arm to disengage from the teeth on the plug housing and the other keys engage the inner coupling ring so that the inner coupling ring rotates in unison with the outer ring actuator so that the components may be unthreaded.

5,590,229

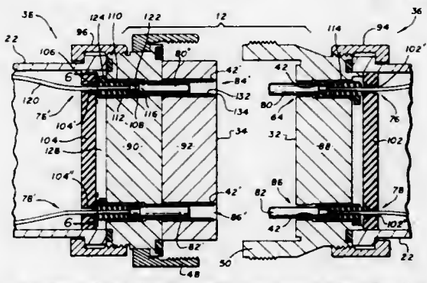
MULTICHANNEL FIBER OPTIC CONNECTOR

Robert P. Goldman, Woodland Hills; Akbar Arab-Sadeghabadi, Simi Valley, and Anselm F. Varni, Woodland Hills, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 22, 1994, Ser. No. 231,385

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—59 **21 Claims**



1. A connector for simultaneously contacting a first plurality of optical fibers, each of which includes a ferrule-mounted terminal end, with a second plurality optical fibers, each of which includes a ferrule-mounted terminal end, comprising, in combination:

a) a male member comprising a first body element having a plurality of internal channels extending therethrough for retaining said first plurality of ferrule-mounted terminal ends;

b) a female member comprising a second body element having a plurality of internal channels extending therethrough for retaining said second plurality of ferrule-mounted terminal ends so that, when said male and female members are engaged to one another, each of said channels of one body member is substantially coaxial with a channel of the other body member when said channels are engaged whereby the terminal ends of corresponding optical fibers are axially aligned;

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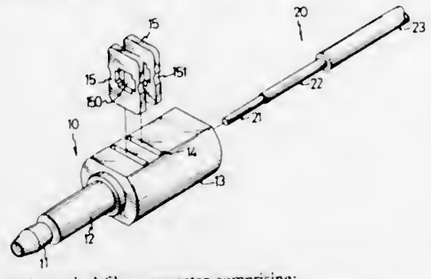
c) each of said members including at least one spring-loaded assembly including a spring coaxial with an internal channel of a body element for exerting a compressive force between the ends of aligned ferrule-mounted optical fibers;
d) a fastener for engaging said members to one another; and
e) an asymmetrical keying member associated with each of said fibers for rotationally aligning the terminal end thereof.

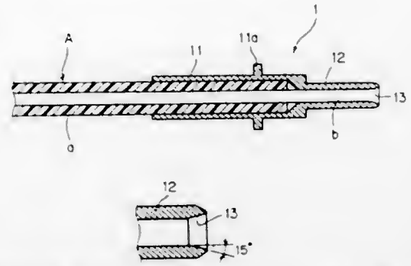
5,590,230
OPTICAL FIBER CONNECTOR INCLUDING HOUSING WITH A PLURALITY OF SLOTS HAVING SECURING PLATES
Yu-feng Cheng, No. 7, Fu Hsing St., Tu Cheng Hsiang, Taipei Hsien, Taiwan
Filed Nov. 13, 1995, Ser. No. 585,439
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—77 **3 Claims**



1. An optical fiber connector comprising:
a tubular housing which defines a lumen, including:
a distal portion having a first inside diameter and adapted to receive a head portion of a optical fiber;
an intermediate portion having a second inside diameter larger than the first inside diameter, wherein the intermediate portion is substantially adjacent to the distal portion and adapted to receive a middle portion of the optical fiber; and
a proximal portion having a third inside diameter larger than the second inside diameter, wherein the proximal portion is substantially adjacent to the intermediate portion and adapted to receive a tail portion of the optical fiber;
a plurality of parallel slots each defined through a corresponding upper periphery and lower periphery of said housing; and
a plurality of securing plates each being positioned inside said slot with two distal ends thereof substantially protruding slightly out of said slot, the securing plate defining a hole at the center of said plate and further defining a recess at both sides of said securing plate for firmly securing a fiber therethrough.

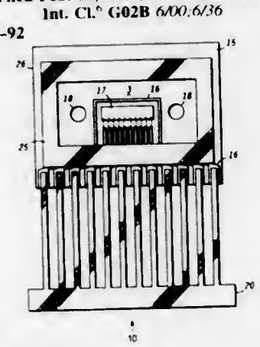
5,590,231
FERRULE
Shigeto Kawamura, and Takehiko Yamamura, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan
Filed Nov. 29, 1994, Ser. No. 346,021
Claims priority, application Japan, Jan. 24, 1994, 6-023283
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—78 **4 Claims**

1. A ferrule comprising:
a tubular core wire holding portion for receiving and holding a core wire portion of a plastic optical fiber; and
a tubular sheath holding portion for receiving and holding a sheath portion of said plastic fiber,
said core wire holding portion including a large-diameter portion at a front end thereof having a tapered inner surface such that an inner diameter thereof increases toward the front end,



wherein an angle at which said tapered inner surface is flared is not more than 3 degrees.

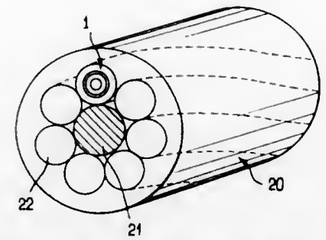
5,590,232
OPTICAL PACKAGE AND METHOD OF MAKING
Robert M. Wentworth, Phoenix; David Galloway; Garland D. Cotney, both of Tempe, and Brian A. Webb, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 16, 1995, Ser. No. 390,209
Int. Cl.[6] G02B *6/00;6/36*
U.S. Cl. 385—92 **21 Claims**



1. An optical package comprising:
a housing defining a mounting area with a plurality of leads formed in the housing, each lead having a first end extending into the mounting area and a second end extending externally from the housing;
a semiconductor die including at least one photonic device with a plurality of electrical terminals, the semiconductor die being mounted on the housing in the mounting area with the plurality of electrical terminals electrically connected to the plurality of leads, and the photonic device further having an active light area positioned to be optically accessible through the mounting area in the housing; and
optical fiber alignment means mounted on the housing in the mounting area for receiving at least one optical fiber and aligning the received optical fiber with the active light area of the photonic device.

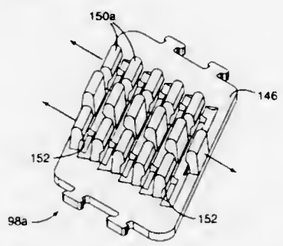
5,590,233
OPTICAL FIBER CABLE AND AN ASSOCIATED METHOD OF MANUFACTURE
Michel Carratt, Houilles, and Michel de Vecchis, Vaureal, both of France, assignors to Alcatel Cable, Clichy Cedex, France
Filed Aug. 3, 1994, Ser. No. 285,287
Claims priority, application France, Aug. 4, 1993, 93 09615
Int. Cl.[6] G02B *6/44*
U.S. Cl. 385—100 **13 Claims**

1. An optical fiber-cable comprising:



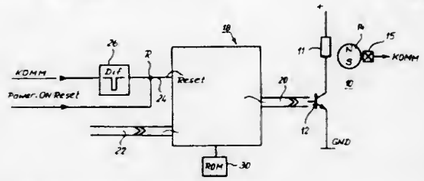
a plurality of optical fibers, each fiber having an optical core surrounded by optical cladding, each of said optical fibers being provided over said optical cladding with a substantially hermetic coating and including over said hermetic coating a coating of plastics material;
said cable further including an outer protective sheath of plastics material surrounding said optical fibers;
wherein each of said optical fibers has a mode field diameter lying in the range 7 μm to 9 μm at around 1550 nm, and a cutoff wavelength that is less than or equal to 1.35 μm, and
wherein said optical fibers are assembled together in said cable by being twisted around one another.

5,590,234
FIBER OPTIC SPLICE ORGANIZERS
Jacqueline J. Pulido, Cedar Park, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 31, 1995, Ser. No. 414,612
Int. Cl.[6] G02B *6/00*
U.S. Cl. 385—135 **19 Claims**



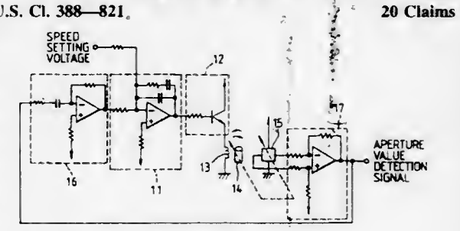
1. An article for releasably securing a plurality of elongate, fiber optic components such as splice elements, the article comprising:
a pad member; and
a plurality of flexible arm members attached and extending generally perpendicular to said pad member, said arm members positioned to form first and second adjacent, parallel grooves for receiving individual fiber optic components, said arm members being staggered along a given one of said grooves to provide a multi-point load on any component inserted therein wherein said first groove has at least two of said arm members located along a first side of said first groove at opposite ends of said first groove, and an additional arm member located along a second side of said first groove, intermediate said ends thereof, such that a fiber optic component may be placed in said first groove without interfering with said second groove.

5,590,235
DC MOTOR CONTROL WITH PERIODIC RESET
Hermann Rappenecker, Vöhrenbach, and Frank Jeske, Tennenbron, both of Germany, assignors to Papst-Motoren GmbH & Co. KG, Georgen, Germany
Filed Nov. 22, 1994, Ser. No. 343,723
Claims priority, application Germany, Dec. 3, 1993, 43 41 203.3
Int. Cl.[6] H02P *7/28*
U.S. Cl. 388—803 **16 Claims**



1. An electric motor system, comprising
an electronically commutated motor (**30**) having a rotor (**14, 33**) and stator winding means (**31, 32**);
a motor-control microprocessor (**18,40**) which has a reset input (**24**) to which, after motor startup, a power-on reset signal can be applied;
means (**35**) for generating rotor-position-dependent reset signals (R), during running of said motor, at times which are a function of rotational position of said rotor (**14; 33**), said reset signals being applied to said reset input;
a memory element (**66**), whose memory state can be changed by a reset process triggered by a power-on reset signal, said microprocessor checking said state in order to discriminate between a power-on reset signal and a rotor-position-dependent reset signal resulting from rotation of said rotor, and
means, in said microprocessor, responsive to application of said rotor-position-dependent reset signal (R) to said reset input (**24**), for resetting said microprocessor to certain predefined initial states.

5,590,236
SPEED CONTROLLER OR AN INSTRUMENT HAVING A SPEED CONTROLLER INCLUDING DETECTION MEANS FOR LINEARLY DETECTING THE AMOUNT OF ROTATION LESS THAN ONE FULL ROTATION OF A ROTATING MEMBER
Osamu Sato, Saitama-ken, and Fumio Mochida, Maebashi, both of Japan, assignors to Canon Denshi Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 767,841, Sep. 30, 1991, abandoned, which is a division of Ser. No. 493,294, Mar. 14, 1990, Pat. No. 5,072,162. This application Jan. 10, 1994, Ser. No. 180,771
Claims priority, application Japan, Mar. 14, 1989, 1-59589
Int. Cl.[6] H02P *5/168*
U.S. Cl. 388—821 **20 Claims**



1. A speed controller comprising:
a drive source as a rotating member;
input means for inputting driving speed information on the driving speed of said rotating member;

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driving means for rotatably driving said rotating member less than one full rotation thereof on the basis of said driving speed information;

detection means for directly detecting a movement amount of said rotating member and outputting a detection signal which varies linearly with the position of said rotating member representing movement amount information;

means for forming rotating speed information of said rotating member from said detection signal; and

means for correcting said driving speed information by the use of said rotating speed information, said correcting means providing corrected driving speed information.

5,590,237

APPARATUS AND METHOD FOR CONTROLLING THE ROTATION SPEED OF ELECTRIC MOTORS

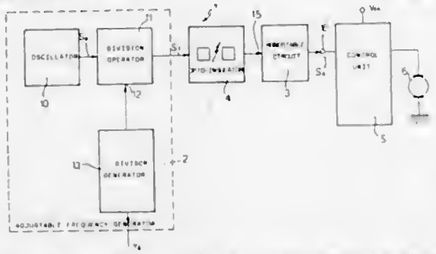
Gilles Audemard, Mirandola, Italy, assignor to Hospal AG, Basel, Switzerland

Filed Jun. 12, 1991, Ser. No. 713,367

Claims priority, application Italy, Jun. 22, 1990, 67457/90

Int. Cl.[6] H02P *7/285*

U.S. Cl. 388—832 **14 Claims**



1. An apparatus for controlling the rotation speed of an electric motor, the apparatus comprising:

means for generating a first signal (S1) with pulses having a variable frequency corresponding to a desired rotation speed of the motor;

means for transforming the first signal (S1) into a second signal (S2) with pulses having the frequency of the first signal (S1) and a predetermined constant duration; and

means for supplying the motor with a pulsating voltage having a frequency and a pulse duration substantially equal to the frequency and the pulse duration of the second signal (S2).

5,590,238

HORIZONTALLY AND VERTICALLY MOVABLE RADIANT HEATER FOR REMOVING PAINT FROM A SURFACE

Birger Ericson, Alingsas, Sweden, assignor to Birger Ericson Fasad AB, Sweden

Continuation of Ser. No. 923,940, Sep. 3, 1992, abandoned. This application Sep. 12, 1995, Ser. No. 526,544

Claims priority, application Sweden, Mar. 5, 1990, 9000763

Int. Cl.[6] B44D *3/16;* **E04G** *23/00*

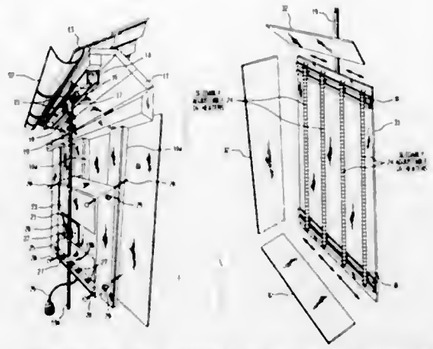
U.S. Cl. 392—412 **33 Claims**

1. An apparatus for facilitating the removal of paint from a vertical wall surface, comprising:

heating means including at least one heat source for heating a painted vertical wall surface;

carrier means for retaining said heating means in operative position with respect to a painted vertical wall surface, said carrier means being selectively movable with respect to a painted vertical wall surface;

guide means for obtaining horizontal and vertical guided travel along distinct horizontal and vertical paths of said carrier means with respect to the painted vertical wall surface and for



retaining said carrier means in the vicinity of a painted vertical wall surface so that said heating means can be selectively moved and exposed to various areas on a painted vertical wall surface; and

fastening means for securing a portion of said guide means to a surface sufficient to permit secured placement of said heating means in an operative position with respect to a painted vertical wall surface.

5,590,239

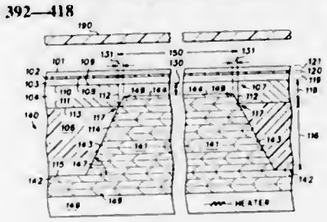
PLANAR UNIFORM HEATING SURFACE WITH ADDITIONAL CIRCUMSCRIBING RING

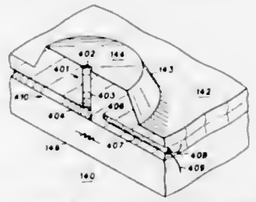
Douglas J. Resnick, Phoenix; William A. Johnson, Paradise Valley; Kevin D. Cummings, Phoenix, all of Ariz., and Hector T. H. Chen, Madison, Wis., assignors to Motorola, Schaumburg, Ill.

Filed Jun. 6, 1994, Ser. No. 254,845

Int. Cl.[6] H05B *1/00;* **G21K** *5/00*

U.S. Cl. 392—418 **13 Claims**





1. A uniform heating fixture in combination with an X-ray mask including a supporting ring structure defining a central opening with a membrane across an end thereof, the fixture comprising:

a heat conductive member having a first plane surface, a second surface, and a third plane surface, the first plane surface and the third plane surface being parallel and connected by the second surface, the third plane surface circumscribing and extending away from the first plane surface; and

the heat conductive member extending into the central opening of the supporting ring structure and thereby positioning the first plane surface adjacent the membrane, at least one of the second surface and the third plane surface of the heat conductive member being formed and positioned to engage the supporting ring structure of the X-ray mask and position the membrane parallel with and spaced from the first plane surface.

5,590,240

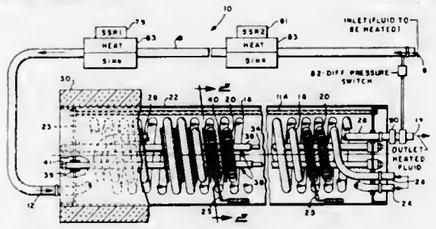
ULTRA PURE WATER HEATER WITH COAXIAL HELICAL FLOW PATHS

Dennis J. Rezabek, Thompson, Ohio, assignor to Process Technology Inc, Mentor, Ohio

Filed May 30, 1995, Ser. No. 453,480

Int. Cl.[6] F24H *1/16*

U.S. Cl. 392—483 **32 Claims**



1. A high efficiency, non-contaminating fluid heater for heating ultra pure water with a minimum amount of contamination as the ultra pure water passes through the fluid heater, comprising an inner and an outer helical passageway, both of which are tubular and formed from an electrically nonconductive material which is substantially inert in the presence of ultra pure water, each of said inner and outer helical passageways having a helical outer surface and defining a helical tubular passageway therein through which said ultra pure water passes as it is heated, said inner helical tubular passageway being in fluid communication with said outer helical tubular passageway and providing for sequential fluid flow between said inner and outer helical passageways, a coiled resistance heater disposed about and being in intimate contact with said helical outer surface of said inner helical passageway, said coiled resistance heater when energized having a temperature of at least 1200° F. to maximize the production of infrared energy having a wavelength of between 2 and 4.3 micron to heat by radiation, conduction and convection the ultra pure water which flows through said inner tubular helical passageway, said outer helical passageway substantially surrounding said inner helical passageway, said inner helical passageway having a longitudinal axis and said outer helical passageway having a longitudinal axis which is substantially coaxial with said longitudinal axis of said inner helical passageway, said longitudinal axes of said inner and outer helical passageways being substantially horizontally disposed, said inner helical passageway at least in part supporting said outer helical passageway, said outer helical passageway being disposed to enable the ultra pure water flowing therethrough to absorb radiated and convective heat from said coiled resistance heater which surrounds said inner helical passageway to increase the efficiency of the fluid heater, and housing means formed from an infrared reflective material substantially enclosing said inner and outer helical passageways to reduce radiated heat flow from said coiled resistance heater to the ambient environment.

5,590,241

SPEECH PROCESSING SYSTEM AND METHOD FOR ENHANCING A SPEECH SIGNAL IN A NOISY ENVIRONMENT

Sangil Park; Ed F. Martinez, both of Austin, Tex., and Dae-Hee Youn, Seoul, Rep. of Korea, assignors to Motorola Inc., Schaumburg, Ill.

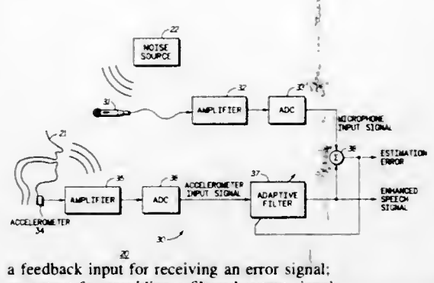
Filed Apr. 30, 1993, Ser. No. 54,494

Int. Cl.[6] G10L *3/02;9/00*

U.S. Cl. 395—2.36 **9 Claims**

6. An adaptive finite impulse response filter, comprising:

a signal input for receiving an input signal;



a feedback input for receiving an error signal;

an output for providing a filtered output signal;

a plurality of filter taps coupled in series with said input signal;

a plurality of variable multipliers for multiplying said input signal and outputs of said plurality of filter taps by corresponding ones of a plurality of coefficients;

a summing device for providing said filtered output signal as a sum of outputs of each of said plurality of variable multipliers; and

prediction means for receiving said error signal, and for recursively updating each coefficient according to a maximum one of first and second predicted values of said filtered output signal, in response to said error signal;

said first predicted value of said filtered output signal having a first smoothing parameter associated therewith;

said second predicted value of said filtered output signal having a second smoothing parameter associated therewith;

said first smoothing parameter providing a faster prediction response after a change in said input signal than said second smoothing parameter.

5,590,242

SIGNAL BIAS REMOVAL FOR ROBUST TELEPHONE SPEECH RECOGNITION

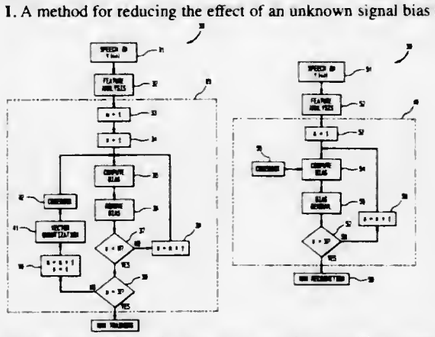
Biing-Hwang Juang, Warren, and Mazin G. Rahim, Manalapan, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 24, 1994, Ser. No. 217,035

Int. Cl.[6] G10L *3/02;9/00;5/06*

U.S. Cl. 395—2.54 **13 Claims**

1. A method for reducing the effect of an unknown signal bias in



an input speech signal for use by a speech recognition system, comprising:

(1) training the speech recognition system by using the following steps:

(a) generating a set of centroids based on a training speech signal;

(b) computing an estimate of the bias for the training speech signal based on maximizing a likelihood function;

(c) subtracting the estimate of the bias from the training speech signal to obtain a tentative training speech value;

(d) repeating steps (b) and (c), wherein each subsequent computed estimate of the bias is based on the previous

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tentative training speech value to arrive at a reduced bias training speech signal value;

(e) recomputing the centroids based on the reduced bias training speech signal to generate a new set of centroids;

(f) repeating steps (b) to (e) to compute a processed reduced bias speech signal and to form an enhanced set of centroids;

(g) utilizing the enhanced set of centroids and the processed reduced bias speech signal as training input for a speech recognizer;

(2) testing an input speech signal to minimize the unknown bias by using the following steps:

(h) utilizing the enhanced set of centroids to compute an estimate of the bias for each utterance of the speech signal based on maximizing a likelihood function;

(i) subtracting the estimate of the bias from the speech signal to obtain a tentative speech value;

(j) repeating steps (h) and (i), wherein each subsequent computed estimate of the bias is based on the previous tentative speech value, resulting in a reduced bias speech signal value; and

(3) utilizing the reduced bias speech signal as input to a speech recognizer.

5,590,243

NEURAL NETWORK SYSTEM WITH SAMPLING DATA

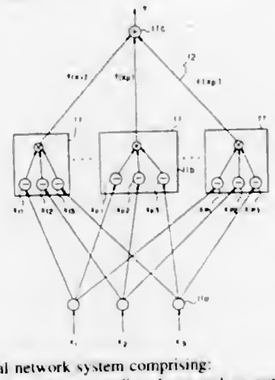
Yoshiakira Akimoto, Kanagawa-ken; Hideo Tanaka; Hiromi Ogi, both of Tokyo; Yoshio Izui, Hyogo-ken; Hisao Tanka, Hyogo-ken, and Toshiaki Sakaguchi, Hyogo-ken, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,540, Jul. 11, 1991, abandoned. This application Oct. 3, 1994, Ser. No. 317,215

Claims priority, application Japan, Jul. 12, 1990, 2-186496; Jul. 12, 1990, 2-186499

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—23 **35 Claims**



1. A neural network system comprising:

an input layer, an intermediate layer and an output layer each layer containing at least one neural element, each having an input and an ouput, for simulating a neuron; and a plurality of inter-layer connections between neural elements wherein each neural element input layer has a connection from the ouput to the input of at least one neural element in the intermediate layer, each neural element in the intermediate layer has a connection from the ouput to the input of at least one neural element in the output layer, and each inter-layer connection has a connecting weight;

sampling data having a plurality pairs of sampling data values, each pair of sampling data values including a sampling data input value and a corresponding sampling data output value wherein the sampling data input values have regular intervals, and learning data having at least three pairs of learning data values, each pair of learning data values including a learning data input value and a corresponding desired output value wherein the learning data input values have irregular intervals;

wherein each neural element of said intermediate layer is assigned a unique pair of sampling data values and has a unique sampling function derived by translating an original sampling function by the sampling data input value assigned to the neural element, wherein the sampling function defines a relationship between the input and output of the neural element;

wherein said connecting weight for each connection between a neural element in said intermediate layer and a neural element in said output layer is set to the sampling data output value assigned to the neural element in the intermediate layer; and

means for training the neural network including means for adjusting the connecting weights so as to minimize an error between a learning data output value and an actual output value obtained by applying a learning data input value to the neural network.

5,590,244

PROFILE CONTROL SYSTEM FOR ROBOTS

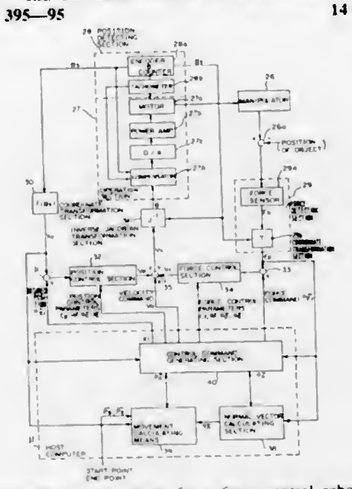
Yasuyuki Nakata, Sagamihara; Akihiko Yabuki, Isehara; Yutaka Yoshida, and Katsushi Nishimoto, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 943,158, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 524,487, May 17, 1990, abandoned. This application Jan. 18, 1995, Ser. No. 374,997

Claims priority, application Japan, May 17, 1989, 1-123275; Jul. 14, 1989, 1-182071; Sep. 20, 1989, 1-241897; Dec. 14, 1989, 1-322652; Dec. 14, 1989, 1-322654

Int. Cl.[6] G06F *15/50;15/46;* **G05B** *19/42*

U.S. Cl. 395—95 **14 Claims**



1. A profile control system for a force control robot system including a robot, a force detecting section for detecting a force acting between an end of the robot and a work object, and a position detecting section detecting the position of the end of the robot and permitting the robot to perform a profiling operation on a surface of the work object from a known start point to a known target point, said profile control system comprising:

calculating means for calculating a unit vector L in a target direction at a contact point between the end of the robot and the work object, by equation

$$L_i = \frac{P_E - P_i}{|P_E - P_i|}$$

wherein a unit vector L_i at a contact point P_i in a profiling operation is calculated using a position vector P_i and pt at the contact point P_i and the target point P_E, respectively;.

normal vector calculating means for calculating a unit vector n at a point of contact between the end of the robot and the work object based on the force detected by the force detecting section;

movement calculating means for calculating a unit vector o in a direction of movement of the end of the robot, comprising:

first means for finding a unit vector a as an outer product of the unit vector n and the unit vector L in a direction of an outer product of the unit vector n and the unit vector L, and

second means for finding the unit vector o as an outer product of the unit vector a and the unit vector n in a direction of the outer product of the unit vector a and the unit vector n;

control command generating means for generating control commands to said robot based on the unit vector o in the direction of movement of the end of the robot and the unit vector n; and

force and position control means for controlling the force of the robot and the position of the end of the robot based on at least the control commands, permitting the robot to perform a profile on a surface of the work object having the known start point, the known target point, and an unknown contour.

5,590,245

METHOD FOR TRANSMITTING IMAGE PROCESSING JOBS FROM A CLIENT SYSTEM, AND ROUTING AND PERFORMING THE JOBS IN AN IMAGE PROCESSING SYSTEM

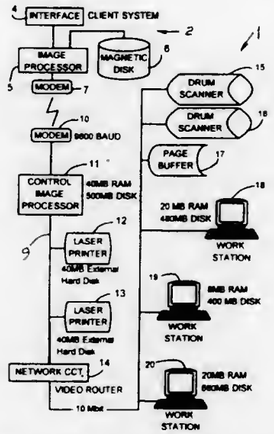
Patrick Leamy; Alan Leamy, and John Gillin, all of Dublin, Ireland, assignors to Offset Studios Limited, Dublin, Ireland

Filed Aug. 24, 1994, Ser. No. 294,030

Claims priority, application Ireland, Apr. 6, 1994, 940297

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—118 **10 Claims**



1. An image processing method carried out by a client system comprising an image processor having a communications device and by an image processing system comprising a network connected to a plurality of image processing workstations, to scanner/printer devices, to printers, and to a control image processor which is in turn connected to a communications device, the method comprising the steps of:

the image processor of the client system generating a transmission file by:

interactively logging client data for instructing image processing operations,

automatically retrieving image data from storage devices to which the image processor is connected using said client data, and

combining the logged client data and the retrieved image data and compressing said logged client data and said retrieved image data to generate the transmission file,

the communications device of the client system automatically transmitting said transmission file to the communications device connected to the control image processor of the image processing system;

the control image processor: automatically decompressing the transmission file received via the communications device, reading a client identifier from the client data and generating an output notification display on a video screen of the control image processor,

generating a parameter display for interactive inputting of job parameters by a supervisor according to data received in said transmission file, the parameters including a job category command classifying the job as direct output, page make-up, re-touching, or imposition, and

generating a job file of image processing commands according to inputted parameters and the client data, and automatically routing the job file to a workstation of the image processing system;

the workstation which receives the job file automatically determining if the job is for direct output to a printer according to the job category command and if so automatically routing the image processing commands to a printer of the network, and if the job is not for direct output the workstation reading the image processing commands within the job file and automatically configuring image processing settings via the workstation operating system for carrying out image processing operations required by said image processing commands, the settings being selected from a look-up table retrieved from the control image processor; and

the workstation carrying out the image processing operations and generating processed image data and, when completed, automatically transmitting a supervisor signal to the control image processor and subsequently routing the processed image data to a printer for printing of color separation films.

5,590,246

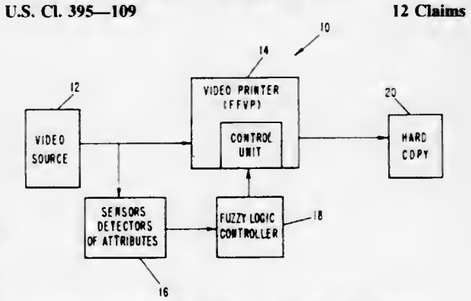
FUZZY LOGIC CONTROLLED VIDEO PRINTER

Ali Asgharzadeh, and Mohammad Jamshidi, both of Albuquerque, N.M., assignors to University of New Mexico, Albuquerque, N.M.

Filed Aug. 15, 1994, Ser. No. 290,232

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—109 **12 Claims**



5. A video printer control method comprising the steps of:

a) sensing at least four attributes of images output from a video source to a video printer;

b) non-iteratively determining video printer output attribute settings based upon attributes sensed by said sensing means via fuzzy logic control comprising a plurality of IF-THEN rules; and

setting output attribute settings of the video printer to the determined settings.

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5,590,247

CHARACTER STRING OUTPUTTING METHOD AND APPARATUS CAPABLE OF VARYING SIZES OF CHARACTERS

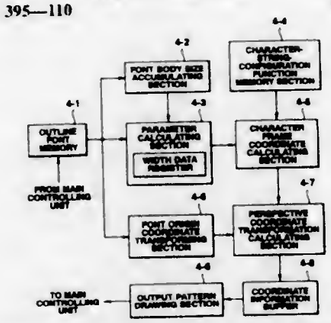
Shio Mikuni, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 296,357

Claims priority, application Japan, Aug. 31, 1993, 5-237136; Aug. 31, 1993, 5-237137

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—110 **14 Claims**



1. A character string outputting apparatus for arranging a character string within a designated region, comprising:

region designating means for designating a character string configuration region so as to arrange the character string within said character string configuration region;

numeral sequence calculating means for expressing said character string configuration region in the form of a character string configuration function and for producing a configuration position of each of characters in the form of a numeral sequence;

character frame producing means for substituting the numeral sequence calculated by said numeral sequence calculating means for the character string configuration function to produce a coordinate value of a character frame in which said character string is allocated into said character string configuration region;

coordinate transforming means for moving a coordinate value of an origin about a font of each character contained in the character string to a predetermined position, and for parallel-moving coordinate data for constituting the fonts of the respective characters in correspondence with moving amounts of the origins; and

output means for arranging the respective fonts of the characters constituting said character string within said character frame produced by said character frame producing means, and for outputting said character string proportionally spaced within said character string configuration region.

5,590,248

METHOD FOR REDUCING THE COMPLEXITY OF A POLYGONAL MESH

Jonathan A. Zarge, Woburn, Mass., and William J. Schroeder, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 815,772, Jan. 2, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 394,044

Int. Cl.[6] G06T *17/20*

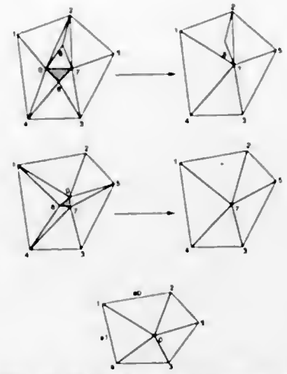
U.S. Cl. 395—121 **19 Claims**

8. A method for reducing complexity of a polygonal mesh while preserving shape and topology, the method comprising the steps of:

analyzing each vertex in said mesh to determine if regions around the vertex are substantially co-planar;

removing said vertex from said mesh if regions around the vertex are substantially co-planar; and

triangulating an opening left by removing said vertex from said mesh, wherein said triangulating comprises calculating an angle value for each remaining vertex defining said opening; removing a vertex with a smallest of said angle values from said opening; connecting vertices adjacent to said removed vertex forming a triangle; determining whether a ratio of the triangle height to base length is less than a first predetermined threshold; and replacing said vertex removed if said ratio is less than said first predetermined threshold.



5,590,249

THREE DIMENSIONAL SPRITE RENDERING APPARATUS AND METHOD

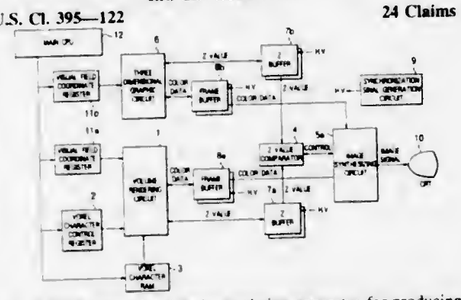
Toshiharu Hanaoka, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1995, Ser. No. 414,234

Claims priority, application Japan, Apr. 1, 1994, 6-064279

Int. Cl.[6] G06T *15/40*

U.S. Cl. 395—122 **24 Claims**



1. A three dimensional sprite rendering apparatus for producing three dimensional graphic images, comprising:

a three dimensional graphic circuit for producing backgrounds of three dimensional graphic and outputting pixel data for each pixel of said backgrounds;

a first buffer for storing depth data for each pixel of said backgrounds;

a voxel character control register for storing control data for voxel characters serving as sprites;

a voxel character memory for storing geometric data for voxel characters;

a volume rendering circuit connected to said voxel character control register and said voxel character memory for producing graphics of voxel characters and outputting pixel data for each pixel of said voxel characters;

a second buffer for storing depth data for each pixel of said voxel characters;

a depth comparator connected to said first and second buffers for comparing the depth of a three dimensional background graphic with the depth of a voxel character graphic and generating a control signal according to a result of comparison; and

an image synthesis circuit connected to receive said pixel data of backgrounds and said pixel data of voxel characters as well as said control signal for synthesizing two pixel data inputs according to said control signal.

5,590,250

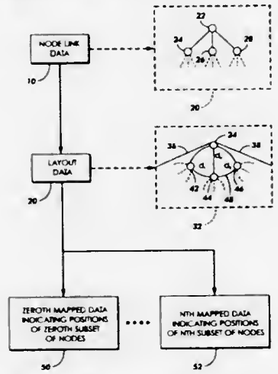
LAYOUT OF NODE-LINK STRUCTURES IN SPACE WITH NEGATIVE CURVATURE

John O. Lamping, Los Altos, and Ramana B. Rao, San Francisco, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 14, 1994, Ser. No. 306,043

Int. Cl.[6] G06T *1/40*

U.S. Cl. 395—127 **40 Claims**



1. A method comprising:

obtaining layout data; the layout data indicating positions in a layout space for parts of a node-link structure; the layout space being a space with negative curvature; the node-link structure including nodes and links, each link relating at least two of the nodes; the layout data indicating positions in the layout space for a set of the nodes; the set of nodes forming a branch that includes two or more levels of nodes including a top level and at least one lower level, the top level including a top level node and the lower levels including lower level nodes, each node at each lower level having a parent node at a next higher level to which the node is related through one link; for each of a set of two or more parent nodes, the layout data indicating:

a parent position in the layout space for the parent node; and

child positions that lie approximately along a circle in the layout space for a number of lower level nodes that share the parent node, the parent position being approximately at the center of the circle; the number of lower level nodes being two or more; adjacent child positions along the circle being separated by approximately a base spacing;

the circles having radii that, together, approximate a function that increases slowly with number of lower level nodes such that the radii and spacings between adjacent child positions along circles are all approximately uniform within the branch;

using the layout data to present a first representation of the node-link structure on a display;

receiving a signal from a user; the signal indicating a change from a first display position to a second display position; the first representation including a first feature near the first display position, the first feature representing a first part of the node-link structure; and

in response to the signal, presenting a second representation of the node-link structure on the display; the second representation including a second feature representing the first part of the node-link structure, the second feature being presented near the second display position; the second representation being perceptible as a changed continuation of the first representation.

5,590,251

COLOR REPRODUCING DEVICE FOR REPRODUCING MATCHED COLORS AND AN OUTPUTTING DEVICE FOR OUTPUTTING INFORMATION FOR REPRODUCING A COLOR OF A COATED SURFACE

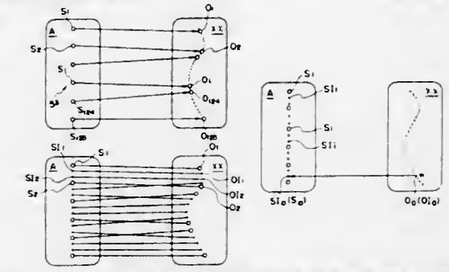
Atsushi Takagi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 5, 1994, Ser. No. 286,350

Claims priority, application Japan, Aug. 6, 1993, 5-196082; Nov. 30, 1993, 5-300386

Int. Cl.[6] G06T *15/50*

U.S. Cl. 395—131 **16 Claims**



1. A color reproducing device to which first data expressing a color expressed in a first colorimetric system is inputted, and which reproduces a color corresponding to the inputted first data and to be expressed in a second colorimetric system different than the first colorimetric system, comprising:

a measuring device measuring each of a predetermined number of colors reproduced by inputting a predetermined number of first data to said color reproducing device, and outputting a predetermined number of second data expressing a color expressed in the second colorimetric system;

estimating means for estimating relationships of interpolated correspondence expressing relationships between second data other than the measured second data and first data corresponding to the second data other than the measured second data, on the basis of a plurality of relationships of correspondence between the first data inputted to said color reproducing device and the measured second data; and

selecting means for, after second data which is the same as or closest to data of a color to be reproduced is selected on the basis of the relationships of correspondence and the relationships of interpolated correspondence, selecting first data corresponding to the selected second data on the basis of the relationships of correspondence and the relationships of interpolated correspondence,

wherein the selected first data is inputted to said color reproducing device, and said color reproducing device reproduces the color to be reproduced.

5,590,252

VIDEO PROCESSOR SYSTEM AND AUDIO PROCESSOR SYSTEM

Kia Silverbrook, Woollahra, Australia, assignor to Canon Kabushiki Kaisha, Japan, and Canon Information Systems Research Australia Pty Ltd., Australia

Filed Apr. 28, 1993, Ser. No. 53,569

Claims priority, application Australia, Apr. 29, 1992, PL2141

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—133 **27 Claims**

1. A video processor comprising:

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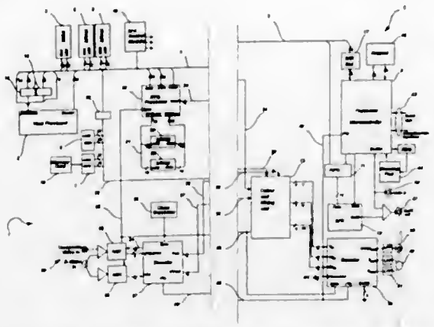


a real-time object (RTO) processor for processing object-based graphic image data describing an object-based graphic image to form pixel-based image data representing the object-based graphic image, said RTO processor incorporating memory means for intermediate storage of only said object-based graphic image data and forming pixel-based image data directly from said object-based graphic image data in real-time without using a pixel-based image data storage means, thereby permitting real-time colour mixing and generation of the pixel-based image data with a first video signal so as to form a second video signal;

a video input means for receiving said first video signal;

at least one colour mixing and generation device arranged to combine said first video signal with said pixel-based image data formed by said RTO processor to provide said second video signal; and

a video output means for outputting said second video signal.

5,590,253

SEQUENCE PROGRAM EDIT SYSTEM FOR INSERTING ADDITIONAL GRAPHIC ELEMENTS AND FOR AUTOMATICALLY INSERTING VERTICAL CONNECTOR LINES

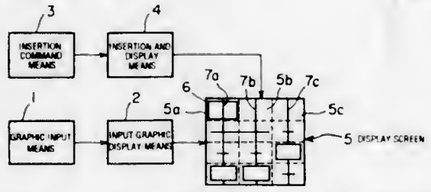
Yasushi Onishi, and Yoshiharu Saiki, both of Minamitsuru-gun, Japan, assignors to Fanuc Ltd., Japan

Filed Jul. 3, 1995, Ser. No. 497,981

Claims priority, application Japan, Jul. 14, 1994, 6-161740

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—133 **3 Claims**



1. A sequence program edit system expressed by a sequential function chart (SFC) system, comprising:

graphic input means for inputting graphic elements of a flow-chart to respective blocks formed by partitioning a display screen into rows and columns;

input graphic display means for displaying the inputted graphic elements on the display screen;

insertion command means for issuing an insertion command to an arbitrary block on the display screen; and

insertion and display means for automatically inserting and displaying graphic elements of vertical connector lines to blocks in the same row as that of the arbitrary block to which the insertion command has been issued.

5,590,254

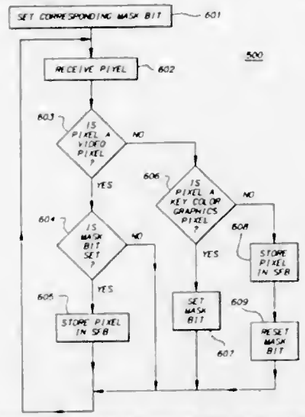
DISPLAYING MULTIPLE VIDEO STREAMS USING A BIT MAP AND A SINGLE FRAME BUFFER

Louis A. Lippincott, Roebling, N.J., and Thomas R. Craver, Chandler, Ark., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 30, 1994, Ser. No. 316,605

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—135 **48 Claims**



1. A computer-implemented process for processing signals for display using a single frame buffer, comprising the steps of:

(a) receiving a plurality of pixels, wherein one or more of the plurality of pixels corresponds to a first display and one or more of the plurality of pixels corresponds to a second display;

(b) generating a display bit map in accordance with the plurality of pixels; and

(c) generating a display mask in accordance with the plurality of pixels, wherein:

if a pixel of the plurality of pixels corresponds to the first display and if a corresponding mask field of the display mask has a first-display value, then the pixel is stored in the display bit map, wherein the mask field comprises at least one mask bit;

else if the pixel corresponds to a key color, then the mask field corresponding to the pixel is set to the first-display value;

else the pixel is stored in the display bit map and the mask field corresponding to the pixel is set to a second-display value.

5,590,255

GRAPHIC DRAWING APPARATUS FOR GENERATING GRAPHS OF IMPLICIT FUNCTIONS

Taku Takeshima; Masayuki Noro, both of Kawasaki, and Tomokatsu Saito, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 14, 1995, Ser. No. 404,107

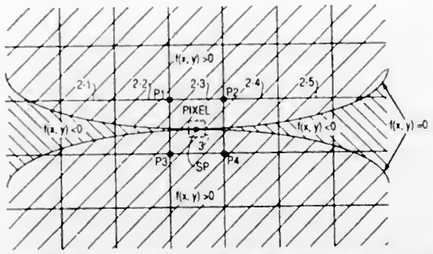
Claims priority, application Japan, Mar. 18, 1994, 6-048717

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—141 **23 Claims**

1. A graphic drawing apparatus for use in an information processing apparatus for displaying a graphic defined by zeros of a polynomial f(x, y) in variables x and y in a logical region on an xy coordinate plane, in a two-dimensional display region corresponding to the logical region, comprising:

zero point calculating means for calculating a zero point interval of the variable y in which zeros of a first univariate polynomial are present within a y-direction display unit width, the first univariate polynomial being obtained by substituting each of a plurality of fixed values of the variable x into the



polynomial f(x, y) and for calculating a zero point interval of the variable x in which zeros of a second univariate polynomial are present within an x-direction display unit width, the second univariate polynomial being obtained by substituting each of a plurality of fixed values of the variable y into the polynomial f(x, y); and

pixel determining means for obtaining a pixel in the two-dimensional display region corresponding to the zero point interval of the variable y for each of the fixed values of the variable x, obtaining a pixel in the two-dimensional display region corresponding to the zero point interval of the variable x for each of the fixed values of the variable y, and determining obtained pixels as pixels representing the graphic.

5,590,256

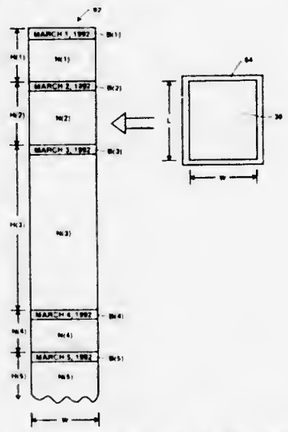
METHOD FOR MANIPULATING NOTES ON A COMPUTER DISPLAY

Michael C. Tchao, Palo Alto, and Stephen P. Capps, San Carlos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 868,013, Apr. 13, 1992, Pat. No. 5,398,310. This application Dec. 14, 1994, Ser. No. 357,707

Int. Cl.[6] G09G *5/34*

U.S. Cl. 395—787 **12 Claims**



6. A method for moving divider indicia in the form of a header bar displayed on a computer display as a linear region which separates two adjacent note areas on a screen of the computer display, the header bar containing information corresponding to at least one of the adjacent areas, said method comprising:

detecting the selection of the header bar by a pointer;

detecting a sizing gesture made with said pointer on said header bar;

moving said header bar as indicated by said sizing gesture; and

scrolling in a scroll direction through said adjacent note areas in response to one or more scrolling commands such that when an end of a note area is reached, the header bar of the next successive note area is displayed at the top of the computer screen in response to a scrolling command, said scrolling including

scrolling, in response to said scrolling command, in the scroll direction to display a remaining undisplayed area of a displayed one of the note areas as well as at least a portion of an adjacent note area when the remaining undisplayed area of the displayed one of the note areas in the scroll direction has an undisplayed length that is greater than zero but less than the height of the computer screen.

scrolling, in response to said scrolling command, in the scroll direction to display a next successive portion of a remaining undisplayed area of a displayed one of the note areas as well as to not display any portion of an adjacent note area when the remaining undisplayed area of the displayed one of the note areas in the scroll direction has an undisplayed length that is greater than the height of the computer screen, and

scrolling, in response to said scrolling command, in the scroll direction to display a least a portion of an adjacent note area with the header bar associated therewith displayed at the top of the computer screen when the end of the displayed one of the note areas and a portion of the adjacent note area are displayed.

5,590,257

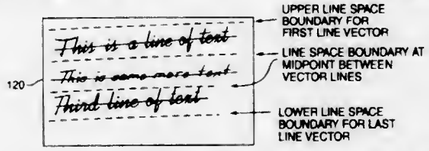
SCRIPT CHARACTER PROCESSING METHOD AND SYSTEM WITH BIT-MAPPED DOCUMENT EDITING

Mitchell D. Forcier, 417 Kirby Ct., Walnut Creek, Calif. 94598

Continuation-in-part of Ser. No. 693,316, Apr. 29, 1991, Pat. No. 5,220,649, which is a continuation-in-part of Ser. No. 673,292, Mar. 20, 1991, Pat. No. 5,231,698. This application Jun. 14, 1993, Ser. No. 77,293

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—792 **40 Claims**



1. A pen-based computer method for a user interactively to edit a series of glyphs which include one or more of handwritten script, text or bitmapped images using a pen-type input device on a document display having a series of lines defining machine editable line spaces for writing script, the method comprising:

inputting and displaying a bit-mapped image containing a series of glyphs arranged in a generally linear format but initially unconstrained to the line spaces;

decomposing the image into image lines; and

mapping each glyph in the image lines to one of the machine editable line spaces;

the step of decomposing the image including:

establishing a baseline for a current image line;

determining a height of the current image line; and

determining beginning and end points of the current image line relative to the image;

the step of mapping including defining the machine editable line space according to the baseline, height, and beginning and end points, and

the step of establishing a baseline comprising:

detecting all non-zero bits in a row which represent visible dots on the image;

counting the detected bits; and

establishing a baseline on the row where the count is less than or equal to a predetermined number of bits.

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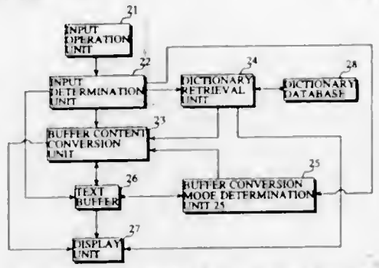
5,590,258

TEXT GENERATION APPARATUS

Shoichi Aoyama, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1994, Ser. No. 316,942
Claims priority, application Japan, Oct. 1, 1993, 5-247146
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—793 **16 Claims**



1. A text generation apparatus for generating a text including character rows separated by blank characters and displaying the text using display means, comprising:

text storage means for storing information for character rows composed of at least one (1) character which are displayed as being interposed with blank characters;

display means for displaying the information stored in the text storage means;

first input operation means for receiving an input of character rows and symbols to be displayed and storing the character rows and symbols in the text storage means;

conversion position specifying means for receiving a specification of a converston position, the specification converting the information stored in the text storage means;

second input operation means for receiving an input of a changing character row;

conversion mode determination means for determining an appropriate conversion mode using an appropriate process for the conversion position received by the conversion position specifying means; and

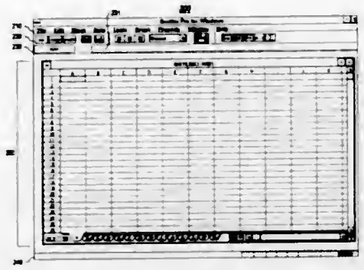
text content conversion means for writing the changing character row received by the second input operation means into the stored information in the text storage means in accordance with the conversion mode determined by the conversion mode determination means.

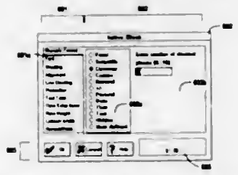
5,590,259

SYSTEM AND METHODS FOR IMPROVED SPREADSHEET INTERFACE WITH USER-FAMILIAR OBJECTS

Charles R. Anderson, Santa Cruz; Robert W. Warfield, Aptos; Istvan Cseri, Scotts Valley; Murray K. Low; Weikuo Liaw, both of Santa Cruz, and Alan M. Bush, Menlo Park, all of Calif., assignors to Borland International, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 866,658, Apr. 8, 1992, Pat. No. 5,416,895. This application May 12, 1995, Ser. No. 440,184
Int. Cl.[6] G06F *17/40*
U.S. Cl. 395—764 **56 Claims**





1. In a computer system having a three-dimensional spreadsheet, said three-dimensional spreadsheet comprising a plurality of information cells arranged in a three-dimensional matrix, said information cells storing user-supplied data and formulas operative on said user-supplied data, each said information cell being uniquely identified by a three-dimensional cell address comprising three-dimensional coordinates, wherein at least one cell stores a formula having a cell address for referencing information stored by another cell, an improved method for creating a formula with cell references to information cells in said three-dimensional spreadsheet, the method comprising:

(a) dividing said three-dimensional matrix of information cells into a plurality of two-dimensional matrices, each of said two-dimensional matrices being represented on a display device as a page array of information cells, wherein cell references between cells on one page array are formed by specifying horizontal and vertical coordinates, and cell references between cells on different page arrays are formed by specifying horizontal, vertical, and page coordinates;

(b) displaying with each said page array of information cells a tab identifier, so that each tab identifier of a particular page array displays the page coordinate for that particular page array;

(c) receiving as input from a user a descriptive name for naming a page array;

(d) in response to step (c), assigning said descriptive name to the page coordinate for the named page array; and

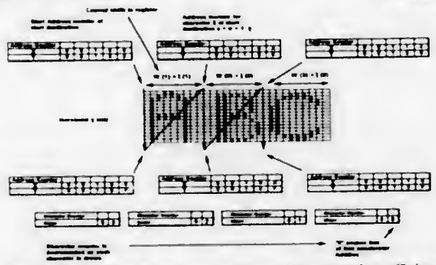
(e) creating a formula having at least one cell reference to a cell on said named page array from a cell on a different page array, so that said at least one cell reference includes said descriptive name as the page coordinate for said named page array.

5,590,260

METHOD AND APPARATUS FOR OPTIMIZING THE DISPLAY OF FONTS IN A DATA PROCESSING SYSTEM

Gary J. Morse, Boca Raton, and Stephen P. Thompson, Delray Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1993, Ser. No. 176,155
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—167 **35 Claims**



1. A method in a data processing system for increasing efficiency in the display of characters on a display within said data processing system, wherein said data processing system includes a system memory and a graphics adapter, said system memory having a page mode, said method comprising:

storing a plurality of characters in said system memory as a plurality of glyph bitmaps, wherein each character has a width and wherein each glyph bitmap for a character is arranged as a column of scanlines such that each scanline within said column of scanlines includes said width of said character; and

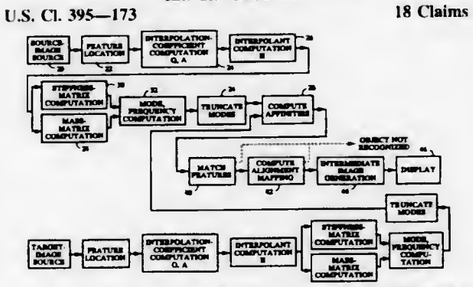
transmitting selected ones of said plurality of glyph bitmaps from said system memory to said graphics adapter, wherein an occurrence of breaks in said page mode are minimized when said glyph bitmap is moved from said system memory to said graphics adapter, increasing efficiency in displaying characters on a display.

5,590,261

FINITE-ELEMENT METHOD FOR IMAGE ALIGNMENT AND MORPHING

Stanley E. Sclaroff, Boston, and Alex Pentland, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 7, 1993, Ser. No. 59,449
Int. Cl.[6] G06T *7/00*
U.S. Cl. 395—173 **18 Claims**



1. A method of processing images by determining a point in a target image comprising electronically encoded target points that corresponds to a given point in a source image comprising electronically encoded source points, the method comprising the steps of:

A) defining first and second simulated elastic bodies associated with the source and target images, respectively, each body comprising body points which include nodal points;

B) identifying source and target feature points among the source and target points, respectively;

C) for each of the images, computing the mode shapes of the modes of collective motion of nodal points of the body associated with that image and whose positions with respect to each other are the same as those of the feature points in the associated image, each of said mode shapes being an eigenvector comprising eigenvector components, each eigenvector component being associated with a different nodal point and representing the relative participation of that nodal point in the mode to which the eigenvector corresponds, and thereby associating with each feature point a generalized feature vector whose components represent the participations as embodied in the eigenvector components, of that feature point's associated nodal point in respective modes;

D) assigning to each of a plurality of the source feature points a target feature point associated with a generalized feature vector whose difference from that associated with that source feature point is sufficiently small according to a predetermined criterion;

E) determining a mapping function of source points to target points in accordance with the relationships between the target feature points to which source feature points are assigned and the points to which the mapping function maps those same feature points;

F) identify the point in the target image that corresponds to the given source point by applying the mapping function to the given source point; and

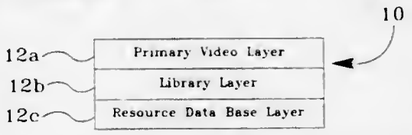
G) based on the correspondence, processing at least one of the source and target images or generating at least one intermediate image therebetween.

5,590,262

INTERACTIVE VIDEO INTERFACE AND METHOD OF CREATION THEREOF

Anthony J. Isadore-Barreca, Oakland, Calif., assignor to Magic Circle Media, Inc., San Jose, Calif.

Filed Nov. 2, 1993, Ser. No. 146,964
Int. Cl.[6] G06T *1/00*
U.S. Cl. 395—806 **10 Claims**



6. In a computer having a video display, an interactive video computer/user interface, comprising:

a live action video presentation having a plurality of frames, the plurality of frames being divided into a plurality of sequences;

a resource database layer having therein a plurality of resource items, each of the resource items being an item of information available to the user; and

a library program portion for causing the computer to display a specific one of a plurality of key frames of said video presentation when said video presentation is stopped by the user at any of the frames, and further for defining a plurality of hot spots within the key frames, the hot spots designating those portions of the key frames about which additional information is available, and further for linking each of said hot spots with a specific one of the resource items such that, when the user selects one specific hot spot, then the specific resource item designated as being associated with that hot spot is presented to the user on the video display.

5,590,263

Patent Not Issued For This Number

5,590,264

METHOD AND APPARATUS FOR GRAPHIC ASSOCIATION OF USER DIALOG DISPLAYS WITH PRIMARY APPLICATIONS IN A DATA PROCESSING SYSTEM

Patrick J. Keane, Grapevine, Tex., and Justin J. C. Richards, Warwick, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1991, Ser. No. 683,381
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—340 **5 Claims**

1. A method of managing a computer display system having a graphic pointing device, a plurality of simultaneously active software applications displayed therein and one or more common user dialogs which are displayable within separate windows within said computer display system and wherein each common user dialog may be displayed in association with multiple ones of said plurality of simultaneously active software applications, said method comprising the steps of:

creating a unique miniature graphic representation for each of said plurality of software applications;

displaying said unique miniature graphic representation for a selected software application within a window display of a common user dialog displayed in association with said

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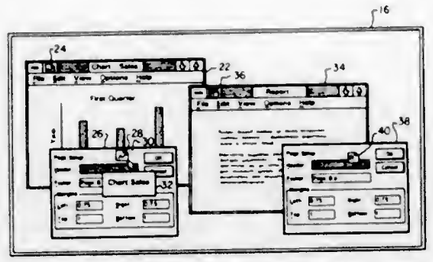


selected software application in response to a displaying of said common user dialog wherein a user may readily determine which selected software application is associated with said displayed common user dialog upon reference to said unique miniature graphic representation; and

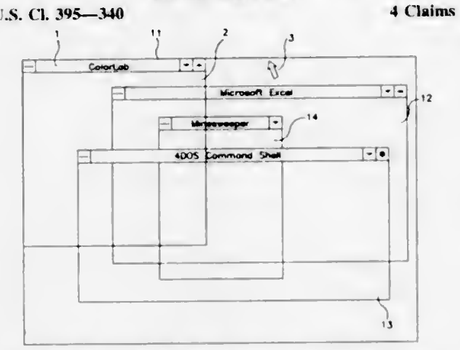
displaying a graphic identification of said selected software application in response to a selection of said unique miniature graphic representation utilizing said graphic pointing device.

5,590,265

SYSTEM WHICH CAN DISPLAY MULTIWINDOWS AND ITS WINDOW DOSPLAY METHOD

Toshiyuki Nakazawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1993, Ser. No. 95,218
Claims priority, application Japan, Jul. 27, 1992, 4-219750
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—340 **4 Claims**



1. A system which can display multiwindows, comprising:

window information memory means for storing a content and a display position of each of a plurality of windows and a higher/lower hierarchy among the windows;

first display control means for allowing the plurality of windows to be displayed on a same screen in a manner such that the content of a window with a higher hierarchy is displayed to overlap two or more windows of a lower hierarchy based on information stored in said window information memory means;

instructing means for providing instructions to display the windows in a transparent state in which the plurality of windows are displayed on the same screen by said first display control means; and

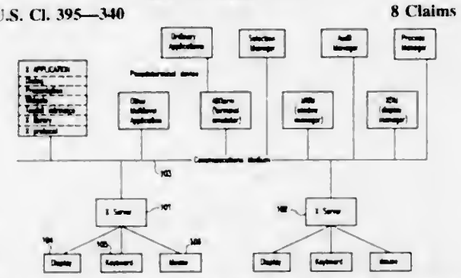
second display control means, which operates in response to the instructions of said instructing means, for allowing each window, except for contents within frames of the windows, to be displayed based on the hierarchy information stored in said window information memory means in a manner such that frames of lower hierarchy windows are overlapped by frames of higher hierarchy windows and are displayed with a title bar including a window name on the basis of a higher/lower hierarchy among the windows stored in said window information memory means.

5,590,266

INTEGRITY MECHANISM FOR DATA TRANSFER IN A WINDOWING SYSTEM

Mark E. Carson; Mudumbai Ranganathan, both of Montogomery County, and Janet A. Cugini, Walkersville, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1994, Ser. No. 321,644
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—340 **8 Claims**



1. A regrading selection mechanism for a secure windowing system comprising:

a plurality of client programs running in separate window on said windowing system, each of said programs displaying data within its window;

a client called a Selection Manager for cutting and pasting operations to transfer data from one client program window to another client program window, the Selection Manager meeting Compartmented Mode Workstations (CMW) requirements and sending events to applications to notify the application of any changes in state, said Selection Manager manipulating ownership and other security properties of data being transferred to allow a controlled verifiable data transfer to take place;

wherein the windowing system uses dummy window identifications (IDs) in communicating to a lower level process during a Mandatory Access Control (MAC) upgrade operation.

5,590,267

METHOD AND SYSTEM FOR SCALABLE BORDERS THAT PROVIDE AN APPEARANCE OF DEPTH

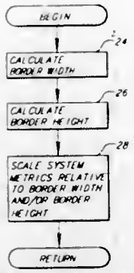
Laura J. Butler, Bellevue, and Joyce A. Grauman, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 62,845, May 14, 1993, Pat. No. 5,452,406.
This application Jun. 5, 1995, Ser. No. 462,523
Int. Cl.[6] G09G *3/00*
U.S. Cl. 395—340 **7 Claims**

1. In a data processing system having memory means holding system metrics, a processor that produces a user interface and an output device with a resolution of a number of horizontal dots per inch and a number of vertical dots per inch, a method comprising the steps of:

(a) determining with the processor a minimum border width for each border in the user interface for the border to be sufficiently visible, based on the resolution of the output device, each border having vertical edges and horizontal edges;

(b) determining with the processor a minimum border height for each border in the user interface for the border to be sufficiently visible, based on the resolution of the output device;



(c) drawing the vertical edges of the borders in the user interface to have the minimum border width and drawing the horizontal edges of the borders to have the minimum border height;

(d) storing the minimum border height and the minimum border width in the memory means as system metrics;

(e) scaling other system metrics to have scaled values that are proportional to the minimum border height or the minimum border width; and

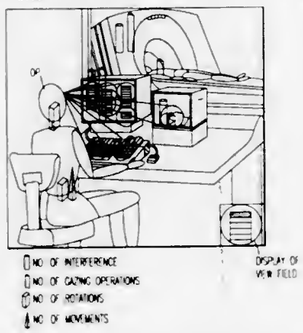
(f) storing the other system metrics in the memory means.

5,590,268

SYSTEM AND METHOD FOR EVALUATING A WORKSPACE REPRESENTED BY A THREE-DIMENSIONAL MODEL

Miwako Doi; Mika Fukui; Ikiko Nishida, and Nobuko Kato, all of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1994, Ser. No. 220,180
Claims priority, application Japan, Mar. 31, 1993, 5-074716
Int. Cl.[6] G06F *3/00;* **G06T** *17/00*
U.S. Cl. 395—326 **39 Claims**



1. A system for evaluating a virtually produced workspace wherein various objects are arranged, by causing a predetermined operator model to conduct a motion in said workspace, said system comprising:

first setting means for setting a sequence in which said operator model conducts a motion in said workspace, and for setting objects at which said operator model is to gaze when said operator model conducts a motion in accordance with said sequence; and

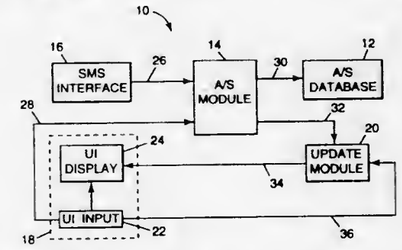
display means for visibly displaying on a screen a visual field area of each of said objects which is set by said first setting means, a visual field area being defined when said operator model gazes at an object which is set.

5,590,269

RESOURCE ASSIGNMENT SYSTEM PROVIDING MIXED-INITIATIVE USER INTERFACE UPDATES

John M. Kruse, Minneapolis, Minn.; John E. Collins, Hudson, Wis., and Elizabeth M. Sisley, Woodbury, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Apr. 22, 1994, Ser. No. 231,031
Int. Cl.[6] G06F *15/00;7/00*
U.S. Cl. 395—209 **31 Claims**



29. A computer-implemented system for assigning a plurality of resource requests among a plurality of resource providers, said system comprising:

an assignment database for storing an assignment set, said assignment set defining assignment of one or more of said resource requests among said resource providers;

a user interface for displaying a representation of at least part of said assignment set, and for receiving input from a system user; and

an update module for receiving changes to said assignment set, and for updating said user interface to display a representation of each of said changes to said assignment set, said update module including means for selecting one of a plurality of update modes, said plurality of update modes including:

an assertive mode wherein said update module updates said user interface in response to receipt of each of said changes to said assignment set, and

an update-on-delay mode wherein said update module updates said user interface in response to a combination of said receipt of each of said changes and an elapse of a time delay from a time of said receipt of each of said changes.

5,590,270

METHOD AND APPARATUS FOR DETECTING A LOWER LEVEL SOFTWARE REUSABLE PRODUCT IN GENERATING AN UPPER LEVEL SOFTWARE PRODUCT FROM A LOWER LEVEL SOFTWARE PRODUCT AND CHANGING THE UPPER LEVEL SOFTWARE PRODUCT

Gunji Tsukuda, Kawasaki; Ichiro Naito, Tokyo; Hirofumi Danno, Yokohama; Kazutoshi Tamura, Yokohama; Hiroshi Tsukino, Yokohama; Hideo Kamiko, Yokohama; Hirokazu Mimura, Yokohama; Akiko Fukuya, Dazaifu, and Hiroyuki Maezawa, Tama, all of Japan, assignors to Hitachi, Ltd.; Hitachi System Engineering, Ltd., both of Tokyo, and Hitachi Software Engineering Co. Ltd., Yokohama, all of Japan

Continuation of Ser. No. 791,484, Nov. 12, 1991, abandoned.
This application Feb. 21, 1995, Ser. No. 392,025
Claims priority, application Japan, Nov. 14, 1990, 2-308297
Int. Cl.[6] G06F *17/50;17/30*
U.S. Cl. 395—701 **9 Claims**

1. A reverse engineering method of supporting software reuse in generating an upper level software product from a lower level software product by reusing some software product among multi-level software products ranging from an upper level data flow to a lower level job flow, comprising the steps of:

inputting a plurality of lower level software products each having a job name, at least one program name, at least one file

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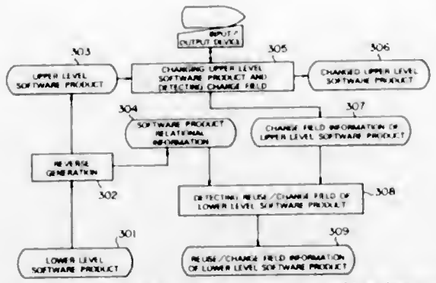


name, and at least one arrow connecting said at least one program name with said at least one file name;

generating an upper level software product having program names, file names, and arrows connecting said program names and file names of a plurality of lower level software products, said lower level software products connected to one another at a place where there is a common file name in any of the plurality of lower level software products, said upper level software product having a sheet name;

generating relational information including the same sheet name and job names included in any of said connected plurality of lower level software products;

displaying said upper level software product on an input/output interface;

inputting a request for changing a part of said upper level software product via said input/output interface;

changing said part of said upper level software product displayed on said input/output interface in response to said change request;

detecting information of a sheet name and a job name representing a reusable field of said lower level software product included in said upper level software product not changed in said changing step and detecting information of a sheet name and a job name corresponding to a content which was changed in said changing step, in response to a change of said upper level software product; and

providing a user with the detected information with the sheet names and the job names by outputting the detected information to a printer or screen.

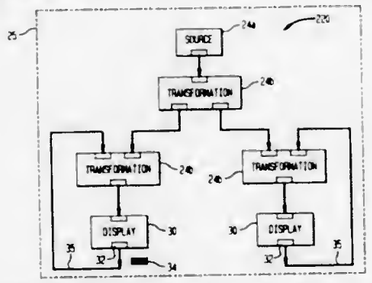
5,590,271

INTERACTIVE VISUALIZATION ENVIRONMENT WITH IMPROVED VISUAL PROGRAMMING INTERFACE

Gudrun J. Klinker, Westborough, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 66,187, May 21, 1993, abandoned.
This application Jan. 16, 1996, Ser. No. 585,810
Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—326 **17 Claims**



1. A method for enhancing user interaction with an output image displayed on a computer screen, said output image having been derived by means of at least one transformation of a source image, said method comprising the steps of:

constructing a dataflow network comprising a plurality of interconnected icons on the screen, said icons representing executable software modules including a first module for acquiring said source image, a second module for applying a transformation to said source image and a third module for displaying said output image;

executing said modules to display said output image on the screen;

providing user parameters to said third module through cursor positioning events to relative to said displayed output image;

transferring said user parameters from said third module directly to said second module; and

modifying said source image by said second module in response to said transferred user parameters so as to provide a corresponding modification to said displayed output image, thereby enhancing user interaction with said output image.

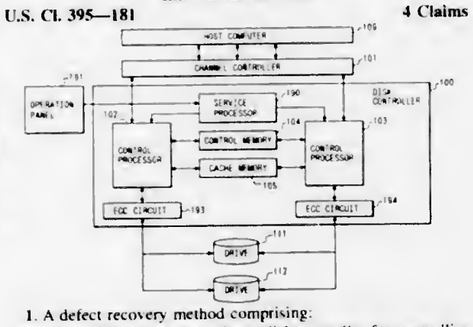
5,590,272

METHOD AND SYSTEM FOR A HIGH-RELIABLE DISK SYSTEM

Tomohiro Murata, Yokohama; Kenzo Kurihara, Tokyo; Kazuhiro Kawashima, Yokohama, and Mitsuaki Niida, Kanagawa-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1992, Ser. No. 993,394
Clams priority, application Japan, Dec. 26, 1991, 3-357579
Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—181 **4 Claims**



1. A defect recovery method comprising:

providing a disk system having a disk controller for controlling and maintaining tracks on a recording medium and copying data among the tracks, the disk controller including an internal storing means, a track dividing means, a track selecting means, a defect identifying means, a defect counting means, a comparing means, a data writing means, a data reading means and a drive;

with said disk controller track divider means, dividing tracks on said recording medium into: (i) a current track group directly available to an external computer and (ii) a spare track group available to said disk controller;

storing an identification of the tracks in the current track group and the spare track group in the disk controller internal storing means;

with said disk controller track selecting means, automatically selecting a track in said spare track group as an alternative track;

selecting a current track from the current track group with the disk controller track selecting means;

if said selected current track has data recorded thereon, identifying defects in data recorded on the selected current track with the disk controller defect identifying means;

with said disk controller defect counting means, counting a number of identified defects on the selected current track;

comparing the counted number with a threshold value with said disk controller comparing means;

in response to the counted number being greater than the threshold value, with said disk controller data writing means, copying the data recorded on said selected current track to said alternative track;

after copying the recorded data from the selected current track to the alternative track, with said disk controller data writing means writing prepared diagnostic data onto said selected current track;

with said disk controller data reading means, reading the preprepared diagnostic data written on said selected current track;

with the defect identifying means identifying any defect positions on said selected current track;

storing each identified defect position in the internal storage means; and

with said disk controller data writing means, copying the data from said alternative track back to said selected current track, without recording in the identified defect positions.

2. A defect recovery system comprising:

a disk system having a disk controller for controlling and maintaining tracks on a recording medium and copying data among the tracks, the disk controller including:

a track divider means for dividing tracks on said recording medium into: (i) a current track group directly available to an external computer and (ii) a spare track group available to said disk controller;

a track selecting means for automatically selecting one of (i) a track in said spare track group as an alternative track and (ii) a current track from the current track group;

a defect identifying means for identifying any defects in data recorded on the selected current track and a position of each identified defect on the selected current track;

an internal storage means for storing (i) an identification of the tracks in the current track group and the spare track group and (ii) storing each identified defect position;

a defect counting means for counting a number of identified defects on the selected current track;

a comparing means for comparing the counted number of identified defects with a threshold value;

a data writing means for (i) copying the data recorded on said selected current track to said alternative track in response to the counted number of identified defects being greater than the threshold value, (ii) writing prepared diagnostic data onto said selected current track, after copying the data from the selected current track to the alternative track, and (iii) copying the data from said alternative track back to said selected current track, without recording in the identified defect positions; and,

a data reading means for reading the preprepared diagnostic data written on said selected current track.

5,590,273

MICROCONTROLLER INTEGRATED CIRCUIT WITH READ ONLY MEMORY CONTAINING A GENERIC PROGRAM

Jean-Pierre Balbinot, Le Kremlin-Bicetre, France, assignor to Alcatel Mobile Communication France, Paris, France

Continuation of Ser. No. 272,073, Jul. 8, 1994, abandoned.
This application Jan. 30, 1996, Ser. No. 593,283
Claims priority, application France, Jul. 13, 1993, 93 08626
Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.01 **20 Claims**

17. A microcontroller-based system comprising:

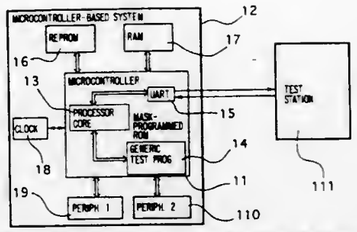
a microcontroller having a processor core and a read only memory; and

a storage device;

said processor core being adapted to exchange data with said storage device;

said read only memory containing a generic program which is executable by said processor core;

said generic program including a writing function for writing a downloading program into said storage device;



said downloading program including a function for downloading an application program into said microcontroller-based system;

said storage device containing said downloading program stored under control of said generic program; and

said microcontroller-based system containing said application program stored under control of said downloading program.

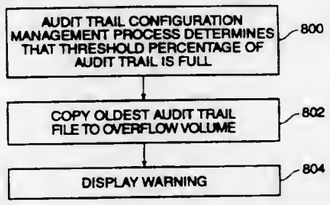
5,590,274

MULTI-VOLUME AUDIT TRAILS FOR FAULT TOLERANT COMPUTERS

Michael J. Skarpelos, San Jose; Robbert van der Linden, Scotts Valley; William J. Carley; James M. Lyon, both of San Jose, all of Calif., and Matthew C. McCline, Bellevue, Wash., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jan. 23, 1995, Ser. No. 377,075
Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.05 **3 Claims**



3. In a fault tolerant computing system having an audit generator, and a plurality of audit trail storage processes, wherein said audit trail storage processes are for storing audit records generated by said audit generator in audit files accessible to said audit storage processes, wherein as successive audit files become full, current responsibility for storing audit records generated by said audit generator is transferred by sending a message from a previously responsible audit trail storage process to a newly responsible audit trail storage process, wherein successively used audit files are assigned unique sequence numbers in order, and wherein each audit trail storage process stores a sequence number identifying a last known audit file employed by one of said audit trail storage processes for storing audit records, a fault tolerant method for processing messages received at a first audit trail storage process, wherein said first audit trail storage process operates as if it were already the responsible audit trail storage process, said method comprising the steps of:

a) receiving, at said first audit trail storage process, a message from a second audit trail storage process, said message including an audit file sequence number of a next audit file for receiving audit records;

b) extracting, at said first audit trail storage process, said audit file sequence number from said message;

c) comparing said received audit file sequence number to the last known audit file sequence number stored in said first audit trail storage process; and

d) upon a determination in said c) step that said received audit file sequence number is greater than the stored last known audit file sequence number, 1) closing the audit file identified

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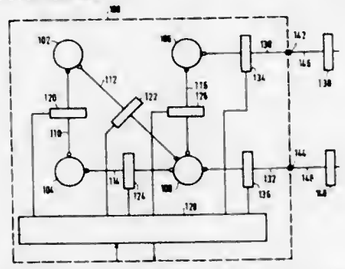
by the audit file sequence number stored by the audit file sequence number stored within said first audit storage process and 2) opening a new audit file identified by said sequence number included within said message for receiving audit records from said first audit trail storage process.

5,590,275

METHOD FOR TESTING AN INTEGRATED CIRCUITRY AND AN INTEGRATED CIRCUIT HAVING A PLURALITY OF FUNCTIONAL COMPONENTS AND HAVING JUNCTION/SWITCH TEST COMPONENTS IN INTERCONNECTING CHANNELS BETWEEN FUNCTIONAL COMPONENTS

Cornelis H. Van Berkel; Maria E. Roncken, and Ronald W. J. J. Saeijs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 16,409, Feb. 11, 1993, abandoned.
This application Feb. 14, 1995, Ser. No. 389,083
Claims priority, application European Pat. Off., Feb. 18, 1992, 92200455
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—183.06 **31 Claims**



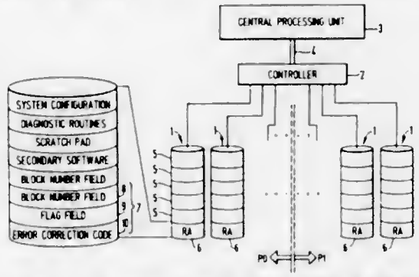
6. An integrated circuit comprising a plurality of testable functional components each having at least one of an active communication initiating port and a passive communication awaiting port interconnected by primary handshake communication channels for communication of in-channel signalizations each primary handshake communication channel having a first terminating end terminating at an active communication initiating port and a second terminating end terminating at a passive communicating awaiting port of said functional components and at least one of said primary handshake communication channels being provided with at least one of i) an inbreaking junction and ii) an outbreaking switch, thereby forming at least one test component that at other times than testing just forms part of the in-channel handshaking and wherein the at least one test component divides said at least one primary handshake communication channel into a string of secondary handshake communication channels which string serially couples together the two functional components having the active and passive communication ports on said at least one primary handshake communication channel, any of said junctions having a passive channel port for in-channel initiated communications and a passive test port for externally initiated test communications, and a active channel port for propagating both said types of initiated communications, any said switch having a passive channel port for in-channel initiated communications, a active channel port for in-channel propagation of these initiated communications and an active test port for extra-channel propagation of these initiated communications and a passive control port for selecting for propagation between said active channel port and said active test port.

5,590,276

METHOD FOR SYNCHRONIZING RESERVED AREAS IN A REDUNDANT STORAGE ARRAY

Anthony D. Andrews, Boulder, Colo., assignor to EMC Corporation, Hopkinton, Mass.

Continuation of Ser. No. 818,039, Jan. 8, 1992, abandoned.
This application Mar. 15, 1995, Ser. No. 404,941
Int. Cl.[6] G01R *31/28;* **G06F** *11/00*
U.S. Cl. 395—182.04 **13 Claims**



1. A method for synchronizing the reserved areas of data storage units included within an array of failure independent data storage units, the data storage units being logically divided into at least two logical groups, each reserved area having blocks of data, each block of data being associated with a unique block of data within each other reserved area, including the steps of:

a. setting a current busy flag to indicate that data storage units within a current logical group of data storage units are being updated;

b. updating, a block of data within a reserved area within the current logical group, and each associated block of data within each other reserved area in the current logical group;

c. upon completely updating the block of data and each associated data block stored in each reserved area in the current logical group of data storage units, setting a next busy flag to indicate that the reserved areas of the data storage units within a next logical group of data storage units are being updated;

d. updating each data block stored in the reserved areas in the next logical group of data storage units;

e. repeating steps (d) and (e) for each logical group;

f. resetting each busy flag to indicate that the updating process has been successfully completed.

5,590,277

PROGRESSIVE RETRY METHOD AND APPARATUS FOR SOFTWARE FAILURE RECOVERY IN MULTI-PROCESS MESSAGE-PASSING APPLICATIONS

Wesley K. Fuchs, Mahomet, Ill.; Yennun Huang, Bridgewater, and Yi-Min Wang, Berkeley Heights, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 22, 1994, Ser. No. 263,978
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—183.14 **20 Claims**

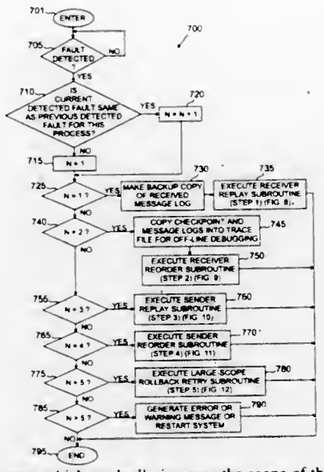
1. A method for bypassing software faults in a system executing a plurality of concurrent processes, said processes passing messages between one another, said fault tolerant method comprising the steps of:

monitoring one or more of said processes for software faults;

periodically performing a checkpoint of critical data associated with each of said monitored processes;

logging said messages that are received by each monitored process in a message log associated with each monitored process; and

performing a progressive retry algorithm upon detection of a fault during said monitoring step to recover said faulty process, said progressive retry algorithm including a plurality of



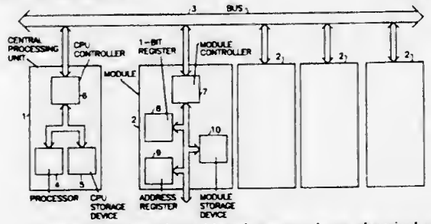
retry steps which gradually increase the scope of the recovery roll back when a previous retry step fails to bypass said detected fault.

5,590,278

METHOD FOR DETECTING ADDRESSING ERRORS IN AN ELECTRICAL UNIT

Herbert Barthel, Herzogenaurach; Horst Daar, Erlangen, and Hartmut Schuetz, Heroldsbach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 10, 1994, Ser. No. 240,345
Claims priority, application Germany, May 11, 1993, 4315713.0
Int. Cl.[6] G06F *13/10*
U.S. Cl. 395—185.06 **6 Claims**



2. A method for detecting addressing errors in an electrical unit, including a central processing unit and a plurality of secondary units comprising the steps of:

(a) storing a first identifier in a register in each of said plurality of secondary units, the first identifier being stored by the central processing unit;

(b) with a first sequence, reading a reference identifier from the register of each of the plurality of secondary units and storing a second identifier in said register of each of the plurality of secondary units, the reference identifier being read by the central processing unit and the second identifier being different from the first identifier;

(c) generating an error signal from the central processing unit when the first identifier is different from the reference identifier;

(d) with a second sequence, reading a further reference identifier from the register of each of said plurality of secondary units and storing a third identifier in each of the plurality of secondary units, the further reference identifier being read by the central processing unit and the third identifier being stored by the central processing unit, wherein the third identifier is different from the second identifier and the first sequence is different from the second sequence; and

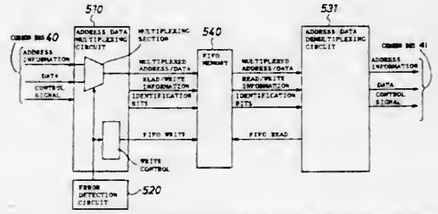
(e) generating an error message when the further reference identifier differs from the second identifier.

5,590,279

MEMORY DATA COPYING APPARATUS

Hiromi Kawabata, and Yutaka Takeda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 111,405, Aug. 25, 1993, abandoned.
This application Mar. 18, 1996, Ser. No. 616,938
Claims priority, application Japan, Aug. 31, 1992, 4-231087
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—185.06 **6 Claims**



1. A memory data copying apparatus for connection to a central processing unit and a main storage apparatus of a first system by way of a common bus and to another central processing unit and another main storage apparatus of a second system by way of another common bus, for multiplexing data read out from said main storage apparatus of one of said first and second systems with address information and successively writing and reading the multiplexed data and address information into and from a FIFO memory and copying the data into said main storage apparatus of the other one of said first and second systems, comprising:

a first circuit set including an error detection circuit, an address-.data multiplexing circuit and an address.data demultiplexing circuit all connected to and corresponding to said common bus of said first system; and

a second circuit set including an error detection circuit, an address.data multiplexing circuit and an address.data demultiplexing circuit all connected to and corresponding to said common bus of said second system;

wherein said error detection circuit in each of said first and second circuit sets detects an error in accessing the corresponding main storage apparatus which occurs on the corresponding common bus, and transmits detection information;

wherein said address.data multiplexing circuit in each of said first and second circuit sets;

(1) multiplexes data and address information from the corresponding common bus;

(2) adds to the data and the address information a respective identification bit for identification between address information and data, and

(3) writes the data, the address information and the identification bit into said FIFO memory when detection information from the corresponding error detection circuit represents absence of an error; and

(4) writes only the address information and the identification bit for the address information into said FIFO memory when the detection information from the corresponding error detection circuit represents presence of an error;

(5) whereby said FIFO memory contains the data, the address information and the identification bit when there is the absence of an error, and said FIFO memory contains the address information and the identification bit and not the data when there is the presence of an error;

wherein said address.data demultiplexing circuit reads out the data, the address information and the identification bit written in said FIFO memory and demultiplexes the data and the address information based on the identification bit;

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wherein, when one of said address.data demultiplexing circuits detects that one of said address.data multiplexing circuits has written into said FIFO memory, said one of said address.data demultiplexing circuits performs read accessing of the FIFO memory and reads the address information, the data and the identification bit written in said FIFO memory; and when the identification bit represents address information, the address-.data demultiplexing circuit stores the address information in an address register in the address.data demultiplexing circuit; and when the identification bit represents data, the address-.data demultiplexing circuit interrupts the read accessing of the FIFO memory while the address.data demultiplexing circuit stores the data into a data register in the address.data demultiplexing circuit, and then the address.data demultiplexing circuit transfers the stored data and address information from the respective registers into the main storage apparatus of the other one of said first and second systems.

5,590,280

METHOD AND AN APPARATUS FOR RESETTING AN INFORMATION RECORDING APPARATUS

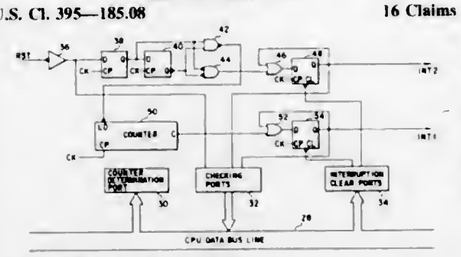
Hiroshi Watanabe, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1994, Ser. No. 306,950

Claims priority, application Japan, Sep. 24, 1993, 5-237731

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—185.08 **16 Claims**



1. A reset apparatus comprising:

detecting means for generating a detection result corresponding to a predetermined signal received from an external device;

determining means, including counting means, for counting a period of time during which the predetermined signal is continuous based on the detection result, and for generating a reset enable signal when the period of time counted is longer than a predetermined period of time;

checking means for checking whether the predetermined signal is output from the external device, said check being performed in response to the enable signal generated by the determining means; and

controlling means for executing a signal process corresponding to the predetermined signal when the checking means checks that the predetermined signal is output from the external device after the predetermined period of time has elapsed.

5,590,281

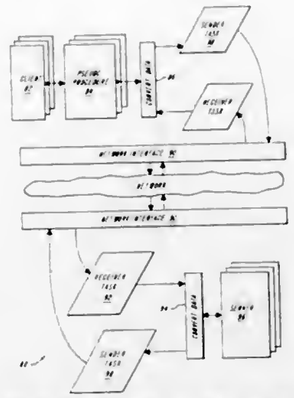
ASYNCHRONOUS BIDIRECTIONAL APPLICATION PROGRAM PROCESSES INTERFACE FOR A DISTRIBUTED HETEROGENEOUS MULTIPROCESSOR SYSTEM

Bruce W. Stevens, North Kingstown, R.I., assignor to The United States of Americas as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1991, Ser. No. 783,661

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—200.01 **14 Claims**



1. For use in a multiprocessing system in which plural and heterogeneous processors perform distributed processing, a subsystem for interfacing component processes of application programs resident in different ones of the plural heterogeneous processors, which subsystem for interfacing asynchronously and bidirectionally enables processing in one and another of at least two heterogeneous processors of the plurality as though the distributed processing was performed under run control of a unitary, undistributed application program, said heterogeneous one and another processors differing by having at least one difference characteristic from among (A) plural, predetermined data representation format characteristics of the plural processors and (B) plural, predetermined different processor architecture characteristics dependent ways of using component processes of an application program, said plural processors being interconnected for multiprocessing by an interprocessor communication subsystem in which signals are borne by a hardware interconnection means, said subsystem for interfacing application program processes comprising:

cross-processor-tasking-of-application-program-components-layer-means residing in the application program level of software hierarchy coupled to a selected processor, which cross-processor-tasking-layer-means is operative to enable one task asynchronous to one component process run by one processor of one heterogeneous kind to use another component task asynchronous to another process run by another processor of another heterogeneous kind in such a way that the fact that the another task is being run by the another processor is transparent to the using processor as if the distributed processing is being performed under run control of a unitary, undistributed application program;

presentation-layer-means residing in the application program level of software hierarchy which is cooperative with the cross-process-tasking-of-application-program-components-layer-means for converting data from the data representation format characteristic of the one processor whose component process is to use the another component process to another data representation format characteristic corresponding to the another processor whose component process is being run thereby and for determining which of plural, predetermined ways the used component process is to be used;

connections-and-task-transport-layer-means in part residing in the application program level of software hierarchy and in part facilitated by the hardware interconnection means of the interprocessor communications subsystem, which connections-and-task-transport-layer-means is cooperative with both the cross-processor-tasking-of-application-program-components-layer-means and the presentation-layer-means for providing a network virtual circuit between sockets defined between the processes borne by the distributed processors and for providing sending and receiving tasks along the network virtual circuit between the sockets of the several processes thereof thereby facilitating execution of the component processor application programs resident in different and heterogeneous processors as though a unitary, undistributed application program were being executed, the hardware interconnection means providing the communication path facilitating unification of execution of the component processes in the separately resident application programs; and

data-and-usage-determined-information-transport-layer-means resident in the application program level of software hierarchy cooperative with the connections-and-task-transport-layer-means for providing data reads and data writes of data representation-format-converted and usage-determined information along the network virtual circuit by the sending and receiving tasks between the sockets of the network virtual circuit.

5,590,282

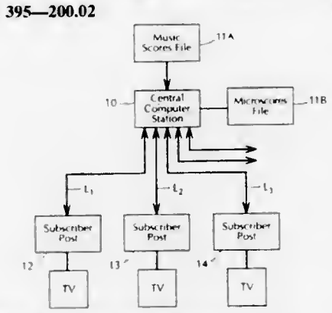
REMOTE ACCESS SERVER USING FILES CONTAINING GENERIC AND SPECIFIC MUSIC DATA FOR GENERATING CUSTOMIZED MUSIC ON DEMAND

Manfred Clynes, 19181 Mesquite Ct., Sonoma, Calif. 95476

Filed Jul. 11, 1994, Ser. No. 272,849

Int. Cl.[6] G06F *13/00*; **G10F** *1/00*

U.S. Cl. 395—200.02 **13 Claims**



1. A music information highway comprising:

A. a central computer station having a first memory file in which is stored a library of different music scores, each score being defined by the nominal notation of a particular music composition including the pitch and duration of each tone, the station including a stored source of sounds and means coupled to the source to play and reproduce the tones of a score selected from the first file;

B. a second memory file which is a matrix having stored therein microstructures related to the relative loudness and duration values of a series of notes, said stored different microstructures each adapted to modify the nominal notation of a selected score including the duration and amplitude of a selected score including the duration and amplitude of the notes to impart expressivity to the reproduced score; and

C. a plurality of subscriber posts coupled by an interactive network to said station, each post having means to select from the first file for reproduction by the station a particular means to select from the first file for reproduction by the station a particular score and to select from the second file a microscore modifying the nominal notation of the selected score so that the selected music composition, played expressively, can be heard at the post.

5,590,283

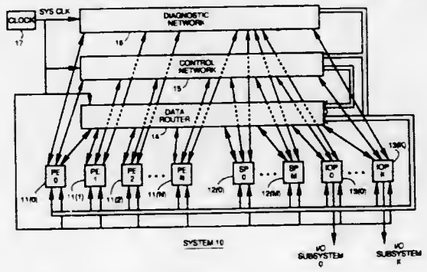
PARALLEL COMPUTER SYSTEM WITH PHYSICALLY SEPARATE TREE NETWORKS FOR DATA AND CONTROL MESSAGES

W. Daniel Hillis, Cambridge; David C. Douglas, Concord; Charles E. Leiserson, Winchester; Bradley C. Kuszmaul, Waltham, all of Mass.; Mahesh N. Ganmukhi, Wexford, Pa.; Jeffrey V. Hill, San Jose, Calif., and Monica C. Wong-Chan, Cambridge, Mass., assignors to Thinking Machines Corporation, Bedford, Mass.

Division of Ser. No. 183,219, Jan. 14, 1994, Pat. No. 5,388,214, which is a continuation of Ser. No. 592,029, Oct. 3, 1990, abandoned. This application Jan. 27, 1995, Ser. No. 380,854

Int. Cl.[6] G06F *15/163;15/173*

U.S. Cl. 395—200.02 **5 Claims**



1. A digital computer comprising

A. a plurality of processing elements each performing data processing operations in connection with commands, at least some of the processing elements performing said data processing operations in connection with said commands which they receive in control network messages, each processing element also (i) generating and receiving data transfer messages, each including an address portion containing an address, for transfer to another processing element as identified by the address and (ii) at least one of said processing elements further generating said control network messages and (iii) said at least some processing elements receiving said control network messages;

B. a communications router comprising a plurality of router node groups interconnected in a tree pattern in a series of levels from a lower leaf level to an upper root level, and each node group in levels above the leaf level including a plurality of router nodes, with router nodes in levels below the root level being connected to a plurality of router nodes in the next higher level thereby forming a fat-tree structure, each node receiving data transfer messages and coupling them to another node or to a processing element connected thereto as determined by the address in the respective address portion; and

C. a control network comprising a like plurality of control network node groups interconnected in a like tree pattern in a series of levels from a lower leaf level to an upper physical root level, each control network node group below the upper root level receiving control network messages from a processing element or a lower-level control network node group and generating a control network message in response thereto for transmission to a higher-level control network node group, and receiving control network messages from a higher level control network node group and generating control messages in response thereto for transmission to lower-level control network node groups, the control network node group at the root level generating control network messages for transmission to the lower level control network node groups in response to control network messages received therefrom.

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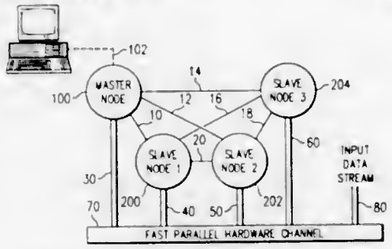
5,590,284
PARALLEL PROCESSING DATA NETWORK OF MASTER AND SLAVE TRANSPUTERS CONTROLLED BY A SERIAL CONTROL NETWORK

Dario B. Crosetto, DeSoto, Tex., assignor to Universities Research Association, Inc., Washington, D.C.

Continuation of Ser. No. 856,622, Mar. 24, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,435
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—200.05 **14 Claims**



1. A parallel data transfer network for the transfer of data controlled by a serial communication network to effect direct point to point communication between processing nodes arranged in an n-dimensional array, independent of physical or logical location of the processing nodes within the array, said parallel data transfer network comprising:

(a) a plurality of processing nodes, each adapted for processing, sending and receiving data and commands; one of said nodes acting as a master node and at least one of said nodes acting as a slave node; each processing node further comprising a transputer connected to (i) at least one serial link for serial transmission of commands to and from the processing node, (ii) at least one memory for retaining data being transferred to and from the processing node, and (iii) a switch connecting the at least one memory, through at least one parallel data bus, to a hardware parallel channel for transmission of data to and from the processing node;

(b) a plurality of serial links connecting at least two of said processing nodes for the serial transmission of commands between said at least two processing nodes;

(c) a parallel hardware channel connected to said processing nodes by a plurality of parallel data buses for the transmission of data between said processing nodes in response to the commands serially transmitted over the serial links; and

(d) a plurality of parallel data buses, each parallel data bus connecting one of said processing nodes to the parallel hardware channel.

5,590,285
NETWORK STATION WITH MULTIPLE NETWORK ADDRESSES

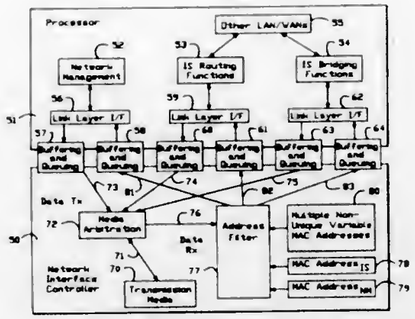
Jeffrey Krause, Los Altos; Niles E. Strohl, Tracy; Michael J. Seaman, San Jose; Steven P. Russell, Menlo Park, and John H. Hart, Saratoga, all of Calif., assignors to 3Com Corporation, Santa Clara, Calif.

Continuation of Ser. No. 98,616, Jul. 28, 1993, abandoned. This application Aug. 9, 1995, Ser. No. 513,167
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.20 **11 Claims**

1. A network interface control apparatus for connection of a data processing system including a plurality of processing modules to a network transmission medium in a network, the network having a physical layer and a data link layer comprising:

a connector to transport data to and from the network transmission medium; and

a medium access control device in the data link layer, coupled to the connector, to receive and transmit frames of data through the connector, the medium access control device including,



a plurality of data channels to communicate between the network transmission medium through the connector and respective processing modules in the data processing system, each channel in the plurality of data channels having an assigned data link layer address,

memory to store the assigned data link layer addresses for the plurality of data channels, and

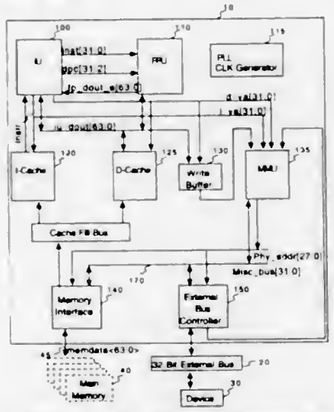
address filtering logic, coupled to the plurality of data channels and the memory, which passes and blocks frames received through the connector in response to the assigned data link layer addresses on the corresponding data channels in the plurality of data channels;

a media arbitration circuit coupled between the connector and the medium access control device, which supplies to the address filtering logic frames of data which are received through the connector from the network transmission medium, and receives from the plurality of data channels, frames of data which are to be transmitted to the network transmission medium from the plurality of data channels.

5,590,286
METHOD AND APPARATUS FOR THE PIPELINING OF DATA DURING DIRECT MEMORY ACCESSES

Peter A. Mehring, Sunnyvale, and Cau L. Nguyen, Milpitas, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 7, 1993, Ser. No. 131,970
Int. Cl.[6] G06F *13/38*
U.S. Cl. 395—250 **17 Claims**



1. In a system comprising a processor component coupled to an external bus, and an external device coupled to the external bus, an apparatus for transferring data from the external device across the external bus to main memory coupled to the processor component

by a high speed memory bus, said external bus operating at a first clock speed and said memory bus operating at a second clock speed faster than the first clock speed, said apparatus comprising:

an external bus controller coupled to the memory bus and the external bus for communicating data between the processor component and the external device coupled to the external bus, said bus controller communicating data across the external bus at the speed of the first clock and communicating data across the memory bus at the speed of the second clock, said external controller comprising:

a buffer for temporarily storing data communicated from/to the external device pursuant to a write/read operation to be performed, said data stored in the buffer in accordance with the speed of the second clock,

a first communication path for communicating data between the external bus controller and the external bus at the rate of the first clock,

a second communication path for causing the communication of data between the buffer and the memory bus at the rate of the second clock,

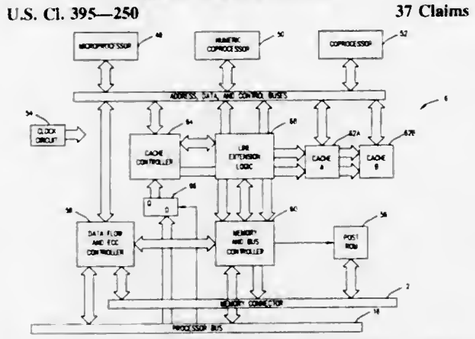
a transfer controller which detects a determined number of words stored in the buffer and causes the completion of the operation with respect to the buffered data while the remaining data to be transferred pursuant to the operation is transferred to the buffer;

wherein said external bus controller continues to buffer remaining data of the operation and complete the operation with respect to the buffered data such that delay incurred by waiting for the data to be communicated to the external bus controller prior to transferring the data to complete the operation is minimized.

5,590,287
CONFIGURABLE INTERFACE FOR ROUTING DATA BETWEEN MISMATCHED DEVICES

Charles P. Zeller, Austin; Terry J. Parks, Round Rock, and Michael D. Durkin, Austin, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 559,872, Jul. 27, 1990, abandoned. This application Mar. 7, 1994, Ser. No. 207,810
Int. Cl.[6] G06F *9/315;13/40*
U.S. Cl. 395—250 **37 Claims**



1. A digital computer system having a data interface for transferring fixed word, length data units output by an 8, 16 or 32 bit wide I/O device to a 32 bit wide data bus by accumulating said 8, 16 or 32 bit wide fixed word-length data units output by said I/O device into a 32 bit data word, comprising:

configurable first, second, third and fourth latches, each of said latches having an input and an output;

configurable means for separately routing a first, second, third and fourth data byte output from said I/O device to the input of said first, second third and fourth latches, respectively wherein said means further comprises means for selectively routing said first, second, third and fourth data byte outputs;

configurable means for accumulating said 32 bit data word from each of said latch output;

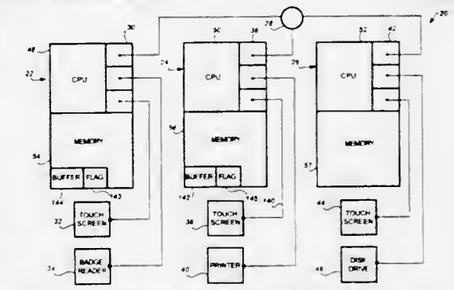
means for generating a code representing a fixed word-length data routing command said codes selectively configuring said latches routing means and accumulating means to route fixed word-length data as a function of data bus width, said code embodied as a set of bused signals generated by a bus controller to thereby permit devices communicating by buses of different width to communicate with each other without requiring circuitry other than said bus controller; and

means for transmitting said accumulated 32 bit data word to said data bus.

5,590,288
DISTRIBUTED DATA PROCESSING SYSTEM AND METHOD UTILIZING PERIPHERAL DEVICE POLLING AND LAYERED COMMUNICATION SOFTWARE

Patrick F. Castor, Naperville; Yung-Chun Tsau, Oak Brook, both of Ill.; Inge B. Kristiansen, Pasadena, Calif., and John W. Nelson, Chicago, Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Continuation of Ser. No. 738,084, Jul. 30, 1991, abandoned. This application Mar. 13, 1995, Ser. No. 402,810
Int. Cl.[6] G06F *13/37;13/372*
U.S. Cl. 395—200.03 **13 Claims**



1. A distributed data processing system, comprising:

(a) network means for enabling electronic communication;

(b) a plurality of computers, each of which comprises a processor, a memory and a plurality of peripheral devices;

(c) layered software means for enabling each of said plurality of computers to send and receive data, procedure calls and function calls through said network means, said layered software means residing in the memory of each of said plurality of computers and including remote procedure calling software means for creating a request block to service a request from one of said peripheral devices;

(d) a plurality of predetermined computer procedures located in said memories of said computers for processing data inputted from said plurality of peripheral devices and means for enabling each of said procedures to call said layered software means;

(e) polling software means residing in the memory means of each of said plurality of computers for successively polling said plurality of peripheral devices attached to said computer to determine whether a request is pending from said peripheral device and said computer including means for servicing said request, prior to said computer polling its next peripheral device, by calling a procedure located in said memory of said computer or, when said computer does not have the procedure in its memory by calling said remote procedure calling software means to request another of said computers to call a procedure located in the memory of that computer to service said request prior to polling the next peripheral device; and

(f) processing means, comprising the processor of each of said computers, for processing input data from said peripheral devices, said processing means being controlled by said layered software means and said polling software means;

wherein each said plurality of peripheral devices includes at least one interface adapter as one of said peripheral devices for electronically connecting said processing means to said network means.

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5,590,289

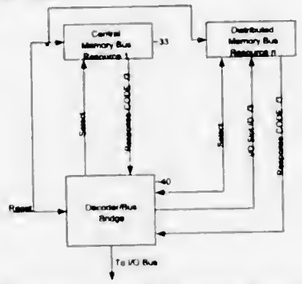
METHOD AND APPARATUS FOR INITIALIZING A COMPUTER SYSTEM HAVING CENTRAL AND DISTRIBUTED ADDRESS DECODE MEMORY BUS RESOURCES

Joseph M. Nardone; Michael J. McTague, both of Portland, and Howard S. David, Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 151,535, Nov. 12, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 384,472

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—289 **18 Claims**



1. In a computer system having a memory bus, a processing unit coupled to said memory bus, wherein said memory bus supports a first plurality of memory bus resources that require centralized address decoding and to a second plurality of memory bus resources which are capable of distributed address decoding, a method of initializing said computer system comprising the steps of:

providing said computer system with decoding logic coupled to said memory bus, said decoding logic being compatible with said memory bus having both centrally decoded memory bus resources and distributed decode memory bus resources, said memory bus providing select lines between said decoding logic and said memory bus resources;

polling each of said memory bus resources coupled to said memory bus to determine whether each is a centrally decoded resource or a distributed decode resource;

dynamically orienting the memory bus select lines such that select lines are driven to said centrally decoded resources by said decoding logic and are driven to said decoding logic by said distributed decode resources; and

maintaining information in said decoding logic identifying which addresses propagated by said processing unit over said memory bus are directed to said centrally decoded resources.

5,590,290

METHOD FOR CONTROLLING A BUS TO PROGRESS TRANSFER CYCLES WITHOUT INSERTING A CYCLE FOR ACKNOWLEDGEMENT

Nobukazu Kondo, Ebina; Seiji Kaneko, Yokohama; Hideaki Gemma, Hadano; Tetsuhiko Okada, Hachioji; Kazuhiko Komori, Ebina, and Koichi Okazawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 60,055, May 13, 1993, Pat. No. 5,428,753. This application Jun. 7, 1995, Ser. No. 487,401

Claims priority, application Japan, May 15, 1992, 4-123569

Int. Cl.[6] G06F *3/04*

U.S. Cl. 395—298 **21 Claims**

1. An information processing system comprising:

a bus for transmitting an address and/or data;

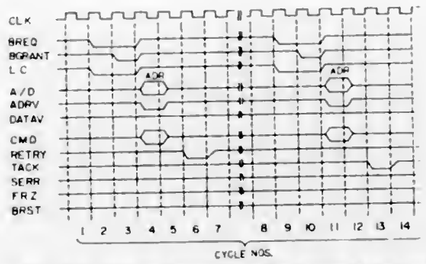
a plurality of modules connected to the bus; and

an acknowledge bus line, separate from said bus, to be used for transmitting an acknowledge report, said acknowledge bus line being connected to said plurality of modules;

a master module which acquires a mastership of the bus, controls the bus and transfers an address and/or data to a slave module being a transfer destination, and releases the mastership of the bus after transmitting of an address and/or data to said slave module via said bus; wherein

said slave module which had received the transferred address and/or data as said slave, transmit an acknowledge report on said acknowledge bus line after receipt of the transferred address and/or data; and

said master module which had transferred address or data as said master, confirms whether or not an executed transferring of address or data was successful upon receipt of said acknowledge report after releasing said mastership of the bus.



5,590,291

DIGITAL SIGNAL PROCESSING SYSTEM FOR LIMITING A RESULT TO BE PREDETERMINED BIT COUNT

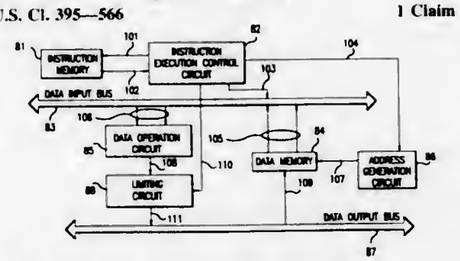
Tokumichi Murakami, and Hideo Ohira, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 807,510, Dec. 16, 1991, abandoned, which is a continuation of Ser. No. 483,840, Feb. 23, 1990, Pat. No. 5,130,797. This application Jan. 4, 1993, Ser. No. 562

Claims priority, application Japan, Feb. 27, 1989, 1-45632; Mar. 31, 1989, 1-81851; May 29, 1989, 1-132646; Oct. 16, 1989, 1-268406

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—566 **1 Claim**



1. A digital signal processing system, comprising:

an instruction memory for storing microinstructions;

an instruction execution control circuit for fetching and decoding said microinstructions from said instruction memory, each of said microinstructions including a data operation instruction and a bit limiting instruction designating a significant bit count;

a data memory for storing data;

a data operation circuit for performing an operation on data from said data memory, said operation being designated by a decoded microinstruction from said instruction execution control circuit; and

a limiting circuit for inputting a result of said operation performed by said data operation circuit, inputting a bit limiting instruction from said instruction execution control unit, physically limiting the number of bits of said result to any integer m designated by the bit limiting instruction of said decoded microinstruction, and outputting the limited result to an output bus with a width of n bits, where m<n.

5,590,292

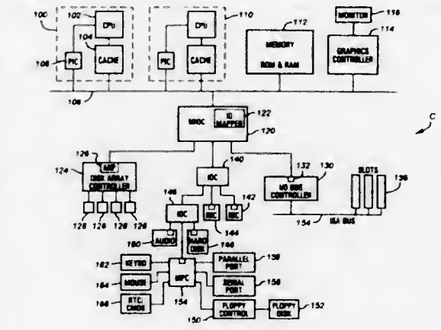
SCALABLE TREE STRUCTURED HIGH SPEED INPUT/OUTPUT SUBSYSTEM ARCHITECTURE

David R. Wooten, Spring; Craig A. Miller, Cedar Park; Kevin B. Leigh, Houston; Robert B. Costley, Spring, and Christopher E. Simonich, Tomball, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 986,918, Dec. 8, 1992. This application Jan. 21, 1993, Ser. No. 7,333

Int. Cl.[6] G06F *13/36;15/17*

U.S. Cl. 395—825 **27 Claims**



1. An input/output subsystem for a computer system, the computer system having a means for providing and receiving addresses and data to perform operations, the input/output subsystem comprising:

a plurality of addressable input/output devices receiving and providing packets, each of said input/output devices having an address range unique to that input/output device, each of said packets having a plurality of fields according to a predetermined protocol, said packets including a command portion and being formed of a plurality of elements; and

means connected to said means for providing and receiving addresses and data and each of said plurality of input/output devices for transferring data between said means for providing and receiving addresses and data and each of said plurality of input/output devices, each of said plurality of input/output devices separately connected to said means for transferring,

wherein said means for transferring includes:

means for determining if an address and data operation is or a plurality of address and data operations are directed to one of said plurality of input/output devices by analyzing said address portion of said operation or operations to determine if the address provided in said address portion of said operation or operations corresponds to an address within one of said unique address ranges of said plurality of input/output devices;

means for converting said address and data operation or said plurality of address and data operations to a packet;

means for transmitting said packet developed by said means for converting to a packet to said one of said plurality of input/output devices as a series of said plurality of elements forming said packet;

means for receiving a packet from one of said plurality of input/output devices as a series of said plurality of elements forming said packet;

means for converting said packet received from said one of said plurality of input/output devices to an address and data operation or a plurality of address and data operations; and

means for providing the output of said means for converting said packet to said means for providing and receiving addresses and data.

5,590,293

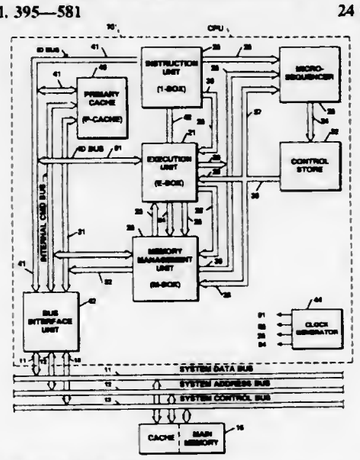
DYNAMIC MICROBRANCHING WITH PROGRAMMABLE HOLD ON CONDITION, TO PROGRAMMABLE DYNAMIC MICROBRANCHING DELAY MINIMIZATION

George M. Uhler, and George G. Mills, both of Marlborough, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 68,835, May 28, 1993, abandoned, which is a continuation of Ser. No. 222,097, Jul. 20, 1988, abandoned. This application Apr. 18, 1995, Ser. No. 425,683

Int. Cl.[6] G06F *9/302;9/26;9/38*

U.S. Cl. 395—581 **24 Claims**



1. A processor comprising:

a) a control store for producing microinstructions in response to microaddresses applied to an input of the control store, the processor operating in machine cycles and the control store producing one of said microinstructions each machine cycle; each microinstruction executing during a plurality of successive machine cycles;

b) a plurality of execution stages, each execution stage using each one of said microinstructions in said successive machine cycles whereby execution of each of said microinstructions overlaps execution of other of said microinstructions, with latch means in each of said execution stages receiving said microinstructions to store and shift each microinstruction for said successive machine cycles;

c) means for generating condition information in response to a condition at an output of one of said execution stages in each of said successive machine cycles;

d) means for generating a next microaddress using said condition information, and for applying said next microaddress to said input of the control store;

e) and means for selecting said condition information generated in a selected machine cycle, for use by said means for generating a next micro-address after a designated number of said successive machine cycles, said designated number of said successive machine cycles being dependent upon a decoded field of one of said microinstructions.

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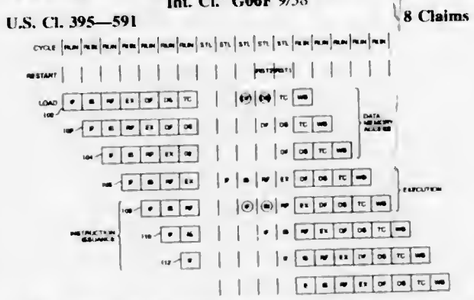
5,590,294
METHOD AND APPARATUS FOR RETARTING PIPELINE PROCESSING

Sunil Mirapuri, Mountain View, and Thomas J. Riordan, Los Altos, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 229,076, Apr. 18, 1994, abandoned, which is a continuation of Ser. No. 671,560, Mar. 19, 1991, abandoned. This application May 24, 1995, Ser. No. 449,588
Int. Cl.[6] G06F *9/38*
U.S. Cl. 395—591 **8 Claims**



8. A method of processing instructions by a processor, said method comprising the steps:

operating said processor by cycling a plurality of instructions through a single pipeline, said single pipeline having a plurality of sequential stages including stages for instruction processing and execution;

stalling all of said stages of the pipeline in response to a detected processing fault without stalling as a result solely of a predicted fault;

servicing the detected fault while the pipeline is stalled;

preloading all of said stages of the pipeline invalidated by said processing fault, while maintaining those stages which are not invalid, so as to fill the pipeline while the pipeline is stalled, said step of preloading comprising backing up invalidated stages of the pipeline and re-executing said stages with corrected information; and

running the pipeline upon completion of preloading, wherein the pipeline includes a stage for executing an instruction, in which for an execution type processing fault the execution stage is invalidated and in which said preloading comprises preloading the execution stage.

5,590,295
SYSTEM AND METHOD FOR REGISTER RENAMING

Trevor A. Deosaran, Sunnyvale; Sanjiv Garg, Fremont, and Kevin R. Iadonato, San Jose, all of Calif., assignors to Seiko Epson Corporation, Japan

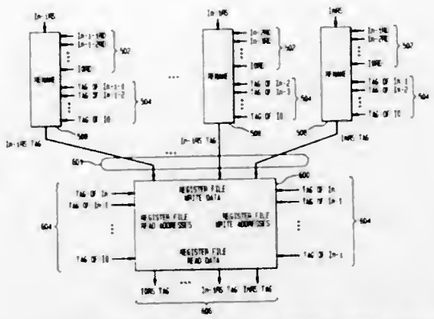
Continuation of Ser. No. 997,948, Dec. 31, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 478,531
Int. Cl.[6] G06F *9/30*
U.S. Cl. 395—393 **17 Claims**

1. A system for renaming source registers of at least one instruction in an instruction window, comprising:

control logic that assigns a tag to each new instruction that enters the instruction window, wherein said tag comprises a unique address in a temporary buffer where instruction execution results are stored;

a recycling queue comprising a plurality of slots equal in number to a predetermined size of the instruction window, each of said plurality of slots containing one of said tags, wherein an order defined by a position of said assigned tags in said recycling queue corresponds to an order of instructions in the instruction window;

selecting means for selecting a tag assigned to a first instruction as a register address of a source register of a second instruction if said source register of said second instruction is dependant on said first instruction, wherein said selected tag is a



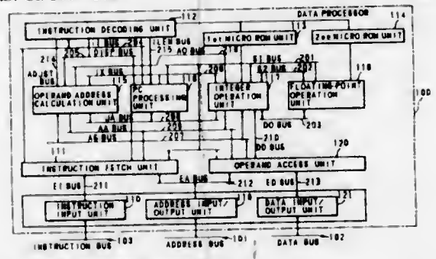
renamed register address for said source register of said second instruction; and

a register file that stores renamed register addresses at address locations indicated by said tags, wherein a tag assigned to said second instruction, when applied to a read address port of said register file, outputs said renamed register address for said source register of said second instruction at a read data port of said register file.

5,590,296
DATA PROCESSOR PROCESSING A JUMP INSTRUCTION

Masahito Matsuo, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 10,085, Jan. 27, 1993, Pat. No. 5,485,587. This application Sep. 29, 1995, Ser. No. 537,046
Claims priority, application Japan, Feb. 7, 1992, 4-22695
Int. Cl.[6] G06F *9/38;9/30;9/32*
U.S. Cl. 395—570 **1 Claim**



1. A data processor comprising:

a memory for storing instructions;

an instruction fetch unit for fetching the instructions from said memory;

an instruction decoding unit for decoding the instructions fetched by said instruction fetch unit;

an instruction execution unit for executing the instructions on the basis of the instruction decoding result by the instruction decoding unit; and

pre-jump means including, a jump target address generating unit having means for generating the jump target address relating to processing the jump instruction, and transferring means for transferring said jump target address to said instruction fetch unit, and means for, at jump instruction processing, instructing to fetch an instruction of the jump target by transferring the jump target address generated in said jump target address generating unit to said instruction fetch unit via the transferring means; and

a mode register for, which can be set by the instruction or hardwares, specifying operation modes;

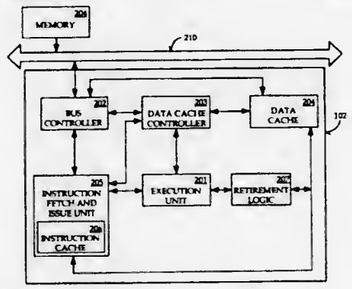
wherein at processing the unconditional jump instruction, said pre-jump means generates said jump target address in said jump target address generating unit, and transfers said jump

target address to said instruction fetch unit via said transferring means, and said instruction fetch unit fetches an instruction of said jump target, when said mode register shows a first mode, said unconditional jump instruction is processed in said instruction execution unit, and when said mode register shows a second mode, said unconditional jump instruction is not processed in said instruction execution unit.

5,590,297
ADDRESS GENERATION UNIT WITH SEGMENTED ADDRESSES IN A MIRCROPROCESSOR

Kamla P. Huck, Portland; Scott D. Rodgers, and Andrew F. Glew, both of Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 4, 1994, Ser. No. 176,066
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—401 **4 Claims**



1. A processor comprising:

a bus;

a memory;

an execution unit coupled to said bus for performing arithmetic functions;

a fetch unit coupled to said bus for determining an entry is to be accessed;

an issue unit coupled to said bus for accessing said entry from storage in said memory;

an address generation unit (AGU) coupled to said bus for generating an address corresponding to said entry, said AGU including a segment register file for storing address segments, and a circuit for rearranging noncontiguous base and limit bit positions of a first address segment when said first address segment is loaded from said memory into said segment register file, thereby producing a second address segment having all base bits and all limit bits contiguous; and

said segment register file includes a resettable null bit which indicates a null segment.

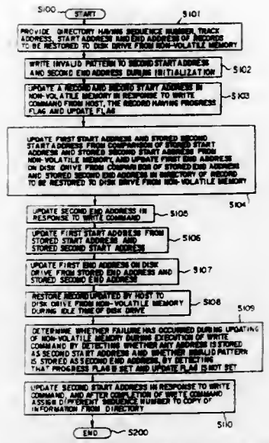
5,590,298
METHOD OF RESTORING AND UPDATING RECORDS IN A DISK CACHE SYSTEM DURING DISK DRIVE IDLE TIME USING START AND END ADDRESSES

Masakazu Kawamoto, Komae, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 210,774, Mar. 21, 1995, abandoned, which is a continuation of Ser. No. 647,623, Jan. 29, 1991, abandoned. This application Nov. 6, 1995, Ser. No. 553,822
Claims priority, application Japan, Jan. 30, 1990, 2-18075
Int. Cl.[6] G06F *12/16;13/00;12/06*
U.S. Cl. 395—403 **6 Claims**

1. A method of restoring write data in a disk cache system comprising the steps of:

providing a host, a disk drive having a plurality of tracks including a plurality of records, a cache memory, a nonvolatile memory storing a directory which controls storing of



tracks in said nonvolatile memory, and a disk controller, wherein said disk controller writes tracks of data from said disk drive, including records addressed by a read command sent from said host, into said cache memory, and said disk controller also writes tracks of data, including records updated by said host, into said nonvolatile memory in response to a write command sent from said host and restores the records updated by said host to said disk drive during an idle time of said disk drive;

updating, in said nonvolatile memory, one of said records in response to said write command sent from said host;

updating, in said directory, a start address and an end address of said one of said records to be restored to said disk drive from said nonvolatile memory in response to an address of said one of said records updated by said host; and

restoring said one of said records updated by said host to said disk drive from said nonvolatile memory during said idle time of said disk drive in response to a write command sent from said host containing said start address and said end address of said one of said records to be restored to said disk drive from said nonvolatile memory.

5,590,299
MULTIPROCESSOR SYSTEM BUS PROTOCOL FOR OPTIMIZED ACCESSING OF INTERLEAVED STORAGE MODULES

Brian R. Bennett, Laguna Niguel, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Oct. 28, 1994, Ser. No. 331,290
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—405 **7 Claims**

6. An information processing system including multiple bus mastering modules, said system comprising:

a system bus;

a plurality of memory modules in communication with said system bus; and

a plurality of bus mastering modules, wherein each of said bus mastering modules includes a subcircuit which, before an address directed to one of said memory modules is placed on said system bus, monitors said address requested by said bus mastering modules, and wherein said subcircuit grants the local bus mastering circuit control of the system bus for a next data transfer cycle if a current memory address is to a different memory module than a previous address request.

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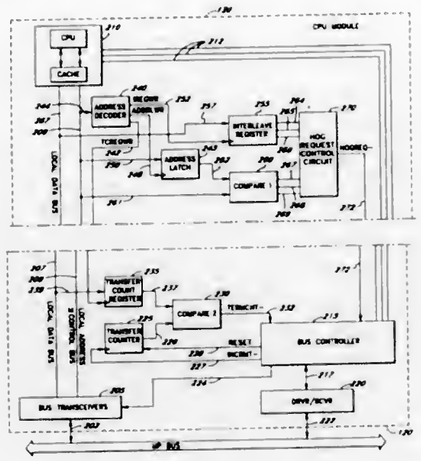
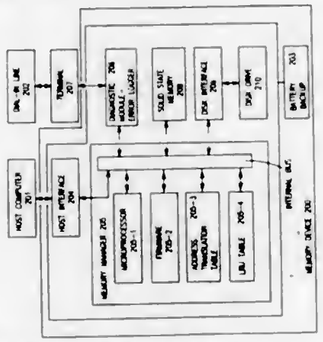


5,590,300
CACHE MEMORY UTILIZING ADDRESS TRANSLATION TABLE

Marvin Lautzenheiser, Springfield, Va., assignor to Zitel Corporation, Fremont, Calif.

Division of Ser. No. 255,251, Jun. 7, 1994, which is a continuation-in-part of Ser. No. 139,559, Oct. 20, 1993, Pat. No. 5,353,430, which is a continuation of Ser. No. 860,731, Feb. 21, 1992, which is a continuation of Ser. No. 665,021, Mar. 5, 1991. This application Feb. 22, 1995, Ser. No. 392,209
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—412 **26 Claims**



1. A cache memory system comprising:

a mass storage device organized into logical blocks, each logical block including the same fixed number of sectors;

a cache memory for temporarily storing selected data associated with said mass storage device, said cache memory organized by logical blocks each including the same number of sectors as said logical blocks of said mass storage device, said cache memory containing a lesser number of logical blocks than said mass storage device;

a cache memory logical block address reference table indexed by cache memory logical block number and which maintains information related to each logical block of said cache memory and including the identity of the mass storage logical block to which a given cache memory logical block is currently associated, if any; and

a mass storage logical block address reference table indexed by mass storage logical block number and which is used for storing information indicating which logical blocks of data currently stored in said cache memory correspond to data stored in, or intended to be stored in, said mass storage device, said mass storage logical block address reference table including for each logical block of said mass storage device:

a flag indicating whether data associated with said logical block is currently stored within said cache memory; and

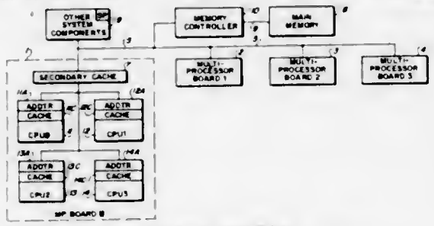
a cache memory logical block number, wherein:

if said flag indicates data associated with said mass storage logical block is currently stored within said cache memory, the cache memory logical block number is then the index into said cache memory logical block address reference table, and data stored in, or intended to be stored in, the corresponding block of said mass storage device is currently stored in the associated block of said cache memory.

5,590,301
ADDRESS TRANSFORMATION IN A CLUSTER COMPUTER SYSTEM

Russell W. Guenthner, Glendale, and Leonard Rabins, Scottsdale, both of Ariz., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Oct. 6, 1995, Ser. No. 540,106
Int. Cl.[6] G06F *9/26;9/34;12/00*
U.S. Cl. 395—412 **12 Claims**



5. A cluster computer system comprising:

A) a plurality of clusters, each said cluster including:

1) a plurality of processors, each said processor having inherent limitations on the range of memory which is directly addressable by a processor address field, said processor address field being divided into higher order and lower order segments, each said processor including:

a) a primary cache; and

b) an address translator; and

2) a secondary cache;

B) a memory having a capacity which exceeds the range each said processor is inherently capable of directly addressing, said memory being addressable by a memory address field, said memory address field exceeding said processor address field, said memory address field being divided into higher order and lower order segments;

C) means establishing a cluster number for each said cluster;

D) means coupling said plurality of clusters, via said secondary caches, to said memory; and

E) each said address translator in each said processor in each said cluster being coupled between said primary cache in its said processor and said secondary cache in its said cluster, said address translator including second address translation logic responsive to memory address field information, said second translation logic comprising means responsive to the digital states of predetermined indicator bits in said memory address field, which predetermined indicator bits are of a lower order than the most significant bit thereof, by effecting one of two address transformations;

1) if said predetermined indicator bits are both a first digital value:

a) forcing a predetermined bit of said higher order segment of said processor address field to a first logic level;

b) copying two higher order bits of said higher order segment of said memory address field to the two lowest order bits of said higher order segment of said processor address field; and

c) copying the contents of the lower order segment of said memory address field to said lower order segment of said processor address field;

thereby specifying a memory region containing information accessible by all said clusters; and

2) if either of said predetermined indicator bits are a second digital value:

a) comparing higher order bits, representing a target cluster, in said higher order segment of said memory address field to a cluster number;

b) if said higher order bits in said higher order segment of said memory address field match said cluster number:

i) copying the two lowest order bits of said higher order segment of said memory address field to the two lowest order bits of said higher order segment of said processor address field in at least one of said processors in said cluster identified by said cluster number; and

ii) copying the contents of said lower order segment of said memory address field to said lower order segment of said processor address field in at least one of said processors in said cluster identified by said cluster number; and

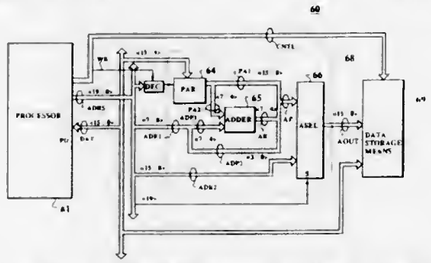
c) if said higher order bits in said higher order segment of said memory address field do not match said cluster number, inhibiting transfer of the contents of said memory address field to said processor address fields in all said processors in said cluster identified by said cluster number;

thereby specifying a memory region containing information accessible only by the cluster specified by said cluster number.

5,590,302
DEVICE FOR GENERATING STRUCTURED ADDRESSES

Koichi Tanaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 935,095, Aug. 26, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,700
Claims priority, application Japan, Aug. 26, 1991, 3-213676
Int. Cl.[6] G06F *12/10*
U.S. Cl. 395—416 **7 Claims**



1. A device for generating structured addresses indicating an address position in one of a memory and an Input/Output (I/O) unit to be accessed, said device receiving address data comprising a first address of i bits (i is a positive integer, high order k bits, low order i-k bits, k is a positive integer), a second address of n bits (n is a positive integer), and a control bit indicating which of said first address and said second address is valid, comprising:

(a) page address storage means for storing a page address of m bits (m is a positive integer, high order m-k bits, low order k bits) of each of a plurality of pages dividing said memory;

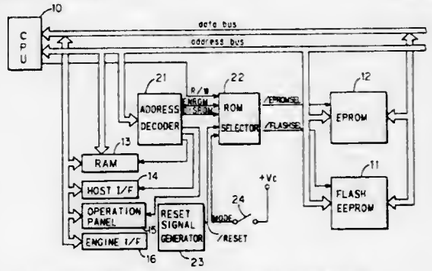
(b) first structured address generation means for receiving said first address and a page address from said page address storage means, for adding only said high order k bits of said first address to only said low order k bits of said page address, and for generating a first structured address of n-bits comprising the high order m-k bits of said page address, intermediate order k bits made from a result of said addition, and said low-order i-k bits made from the low order i-k bits of said first address; and

(c) second structured address generation means for selecting one of said first structured address and said second address based on said control bit to generate a second structured address, and for transmitting said second structural address to one of said memory and said I/O unit, wherein when said first address is valid, said second structured address generation means transmits said first structured address, and when said second address is valid, said second structured address generation means transmits said second address.

5,590,303
MEMORY DESIGNATION CONTROL DEVICE

Kouichi Shibata, Sakai, and Shigenori Motooka, Nishinomiya, both of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 10, 1992, Ser. No. 974,103
Claims priority, application Japan, Nov. 13, 1991, 3-326328
Int. Cl.[6] G06F *12/00;12/02;* **G11C** *16/06*
U.S. Cl. 395—427 **5 Claims**



1. A memory designation control device comprising:

a first rewritable memory device for storing a basic program;

a second memory device, different from said first memory device, for storing a rewriting program for rewriting the contents of said first memory device;

a mode selecting switch for switching between a normal processing mode in which normal processing based on the basic program is performed, and a rewrite processing mode in which rewrite processing based on the rewriting program is performed;

means for bringing only said first memory device, out of said first memory device and said second memory device, into a selectable state when a system power supply is turned on while the mode selecting switch is in a state where the normal processing mode is selected;

means for bringing only said second memory device, out of said first memory device and said second memory device, into a selectable state at the time of a read instruction, while bringing only said first memory device, out of said first memory device and said second memory device, into a selectable state at the time of a write instruction, when a system power supply is turned on while said mode selecting switch is in a state where the rewrite processing mode is selected; and

means for inhibiting, when a system power supply is turned on while said mode selecting switch is in the state where the normal processing mode is selected, said second memory device from being brought into a selectable state if said mode selecting switch is switched to the state where the rewrite processing mode is selected after a system power supply is turned on.

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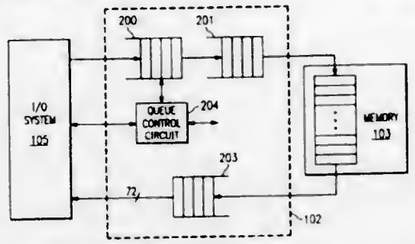
5,590,304

CIRCUITS, SYSTEMS AND METHODS FOR PREVENTING QUEUE OVERFLOW IN DATA PROCESSING SYSTEMS

Richard W. Adkisson, Dallas, Tex., assignor to Covex Computer Corporation, Richardson, Tex.

Filed Jun. 13, 1994, Ser. No. 258,761
Int. Cl.[6] G06F *13/16*
U.S. Cl. 395—427 **30 Claims**



19. A processing system comprising:

circuitry for generating memory requests at a first clock rate;

input queuing circuitry comprising:

a first queue for receiving said memory requests from said circuitry for generating at said first clock rate; and

a second queue coupled in series with said first queue for holding said memory requests when contention for access to a particular memory unit occurs and for outputting said memory requests at a second clock rate;

a memory system containing said particular memory unit for storing and retrieving data in response to said memory requests, said memory system outputting data at said second clock rate in response to read requests from said input queuing circuitry;

an output queue for receiving data from said memory at said second clock rate and outputting said data at said first clock rate; and

queuing control circuitry associated with said input queuing circuitry for preventing overflows of said output queue by controlling a number of said memory requests sent in bursts from said input queuing system to said memory system and by controlling wait time between ones of said bursts.

5,590,305

PROGRAMMING CIRCUITS AND TECHNIQUES FOR PROGRAMMING LOGIC

Richard S. Terrill, Sunnyvale, and Robert R. N. Bielby, Fremont, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 219,688, Mar. 28, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 572,806
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—430 **21 Claims**

18. A method for configuring a plurality of programmable logic devices, comprising the steps of:

providing a source of configuration data, wherein said source is a microprocessor;

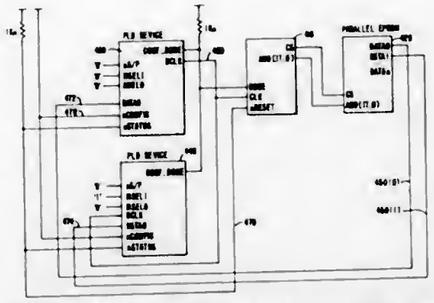
generating a first clock signal from said microprocessor;

generating a second clock signal from said microprocessor;

retrieving a first set of configuration data into said microprocessor;

transferring in parallel, responsive to said first clock signal generated by said microprocessor, via a first direct data path a first portion of said first set of configuration data, in the form of a stream of parallel data bits, from a data port of said microprocessor to a first programmable logic device;

configuring at least a portion of said first programmable logic device with said first portion of said first set of configuration data;



transferring in parallel, responsive to said second clock signal generated by said microprocessor, via a second direct data path a second portion of said first set of configuration data, in the form of a stream of parallel data bits, from said data port of said microprocessor to a second programmable logic device;

configuring at least a portion of said second programmable logic device with said second portion of said first set of configuration data; and

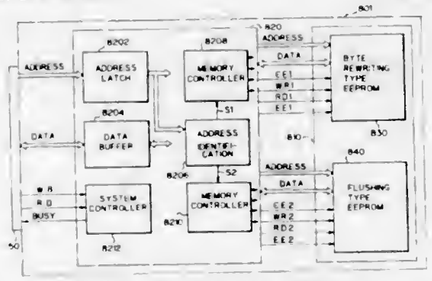
wherein said step of configuring at least a portion of said first programmable logic device is interleaved with said step of configuring at least a portion of said second programmable logic device, wherein said first programmable logic device may be partially configured when said second programmable logic device is partially configured.

5,590,306

MEMORY CARD MANAGEMENT SYSTEM FOR WRITING DATA WITH USAGE AND RECORDING CODES MADE SIGNIFICANT

Mikio Watanabe; Akira Aoki, and Osamu Saito, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1993, Ser. No. 93,640
Claims priority, application Japan, Sep. 8, 1992, 4-239269; Sep. 14, 1992, 4-244766
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—442 **15 Claims**



3. An IC memory card control system comprising:

an IC memory card, which is provided with a plurality of data areas in which data is stored and management areas in which management information is stored for managing recording of the data into the data areas,

said IC memory card being provided with an identification area into which written are an occupation code indicative of recording of the data in a data area and a recording code indicative of an abnormal recording of the data in a data area; and

IC memory card control means, to which said IC memory card is detachably coupled, for storing the management information and the data in said IC memory card, said IC memory card control means comprising

management information read means for reading out the management information stored in the management areas of said IC memory card,

management information updating means for updating the management information read out by said management information read means, and

data recording means for writing the data into said IC memory card,

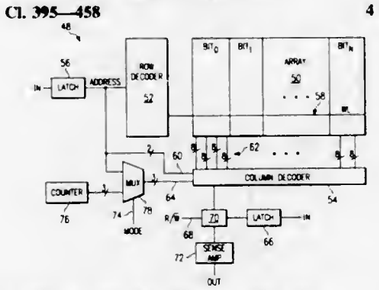
said management information updating means providing such a control that when writing the data into a data area, prior to the data writing, the occupation code and the recording code are written into the identification area in a first significant condition, and after having completed the data writing the recording code is cleared/reset from the first significant condition.

5,590,307

DUAL-PORT DATA CACHE MEMORY

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 5, 1993, Ser. No. 711
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—458 **4 Claims**



1. A dual-port data cache memory, comprising:

a dual-port memory array having a plurality of entries, wherein each of said plurality of entries has a corresponding address, said memory array laid out as a plurality of rows and columns, wherein a plurality of memory cells in a row are selected for reading or writing by activating a single word line, and wherein the plurality of selected cells place data onto a corresponding plurality of bit lines;

a first memory port capable of reading and writing entries to the dual-port memory array, wherein the first memory port is utilized by a processor;

a second memory port capable of reading and writing entries to the dual-port memory array, wherein the second memory port is utilized by a system;

an address latch connected to the second memory port for storing an address generated by the system on an address bus;

a row decoder for decoding a plurality of most significant bits from the address latch, and activating a word line;

a column decoder connected to the plurality of bit lines for selecting a subset thereof, wherein at least one less significant bit than the most significant bits from the address latch are connected to the column decoder, and wherein the subset of bit lines is selected in response to such less significant bits;

a counter for generating a sequence of consecutive binary signals representing numbers; and

means for connecting the binary signals generated by the counter to the column decoder in response to a control signal;

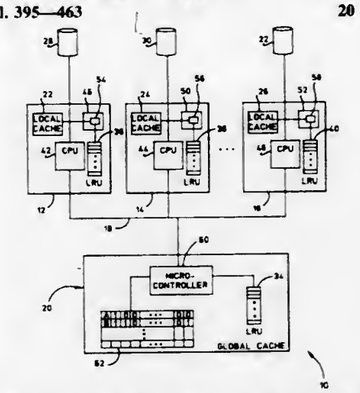
wherein, in response to the control signal, a plurality of entries selected by the column decoder in response to the signals generated by the counter are read from the memory array for a single address stored in the address latch.

5,590,308

METHOD AND APPARATUS FOR REDUCING FALSE INVALIDATIONS IN DISTRIBUTED SYSTEMS

Yifong Shih, Cupertino, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1993, Ser. No. 115,501
Int. Cl.[6] G06F *12/12*
U.S. Cl. 395—463 **20 Claims**



1. A method of reducing false invalidations in a distributed file, multiple processor system having a plurality of processors coupled to a global cache memory, each processor being connected to a central processor unit, local cache memory, and mass storage unit, the global cache memory and each local cache memory maintaining a least recently used (LRU) stack that contains identification indicia for each data record contained in the corresponding cache memory for selectively determining which data records shall be deleted, each read miss and each write operation by a processor resulting in an update to operating system statistical metrics, including a cache memory data input/output rate and miss ratio, and to the global cache LRU stack and the local cache memory LRU stack of the processor, the method comprising the steps of:

responding to each read hit by a processor by updating the local cache memory LRU stack associated with that processor;

defining an update interval of the global cache memory LRU stack as a function of a predetermined statistical metric of data residency time for the local cache memory; and

updating the global cache memory LRU stack no more frequently than at the expiration of the update interval in response to the read hit.

5,590,309

STORAGE PROTECTION CACHE AND BACKING STORAGE HAVING SYSTEM CONTROL ELEMENT DATA CACHE PIPELINE AND STORAGE PROTECTION BITS IN A STACK ARRAY WITH A STACK DIRECTORY FOR THE STACK ARRAY

Edward W. Chencinski, Poughkeepsie; Jeffrey C. Bixler, Highland, and Neal T. Christensen, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1994, Ser. No. 222,191
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—472 **10 Claims**

1. A data processing system having a hierarchical memory comprising:

a plurality of processing elements;

said hierarchical memory including a main memory and a primary cache for each of said plurality of processing elements;

an input output element;

a system control apparatus coupling said plurality of processing elements and said input output element to said memory;

said system control apparatus providing:

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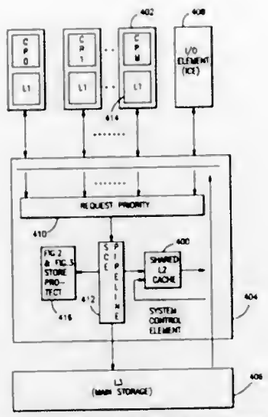


(a) a system control element data cache pipeline for receiving requests from said plurality of processing elements or from said input output element;

(b) a shared cache portion of said hierarchical memory; and

(c) a storage protection cache and backing storage unit including a storage protection cache, a storage protection backing storage coupled to said storage protection cache, and a storage protection store stack for controlling access to said storage protection store, and a set of latches forming a storage protection store stack directory for a request stack of requests that require access to said storage protection storage, said stack directory having stack positions and containing for each stack position pointer fields including a stack address field, a fetch request field, a castout request field, a putaway request field, a Key Op request field, a fetch pending field, a castout pending field and a putaway pending field, and a storage protection cache pipeline which is coupled for receiving said requests either from said system control element data cache pipeline or from said storage protection store.

5,590,310

METHOD AND STRUCTURE FOR DATA INTEGRITY IN A MULTIPLE LEVEL CACHE SYSTEM

Avigdor Willenz, Saratoga, and Yiftach Tzori, Sunnyvale, both of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Continuation of Ser. No. 4,332, Jan. 14, 1993, abandoned.

This application Apr. 21, 1995, Ser. No. 426,440

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—473 **6 Claims**

1. A computer system having a processor bus including data and address portions, and a memory bus coupled to a main memory, said main memory including a plurality of cacheable and non-cacheable memory locations, said computer system comprising:

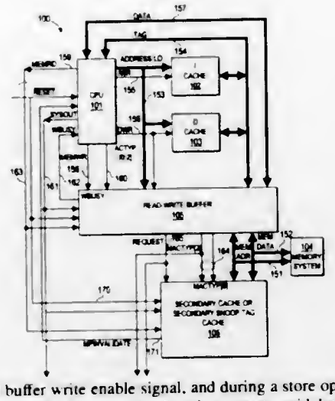
a primary cache memory coupled to said processor bus, said primary cache memory receiving (i) a datum placed on said data portion of said processor bus and (ii) a cache write enable signal which is asserted when said datum on said processor bus is to be written into said primary cache memory;

a buffer memory, coupled to said processor bus and said memory bus, said buffer memory including a plurality of read registers and a plurality of write registers, said buffer memory receiving (i) said datum placed on said processor bus and (ii) a buffer write enable signal which is asserted when a datum is to be written into one of said write registers;

a central processing unit coupled to said processor bus, said central processing unit, during a store operation to a cacheable memory location, asserts said cache write enable signal and said buffer write enable signal, and during a store operation to a non-cacheable memory location asserts said buffer write enable signal and deasserts said cache write enable signal;

a circuit receiving said cache write enable signal and said buffer write enable signal for generating a control signal for indicating whether a store operation is performed on a cacheable memory location or a noncacheable memory location, in accordance with whether or not said cache write enable signal is enabled and whether or not said buffer write enable signal is enabled; and

a secondary cache memory receiving said control signal, said secondary cache memory performs a store operation when control signal indicates that said store operation is directed to a cacheable memory location.



5,590,311

SYSTEM AND METHOD FOR EMULATING DISK TRACKS TO MAINTAIN DATA FORMAT COMPATIBILITY

Hitoshi Matsushima, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

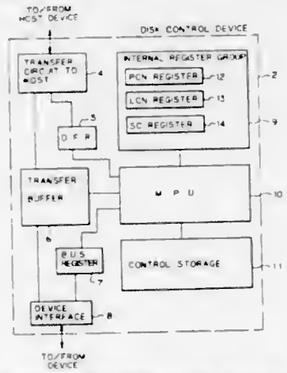
Continuation of Ser. No. 800,969, Dec. 2, 1991, abandoned.

This application Jun. 14, 1994, Ser. No. 259,558

Claims priority, application Japan, Nov. 30, 1990, 2-334167

Int. Cl.[6] G06F *13/00;5/00*

U.S. Cl. 395—500 **20 Claims**



1. A disk track emulation system for making a first variable track length data format used by a host device compatible with a second variable track length data format used by a disk device;

said first data format including cells each consisting of n bytes, N number or cells being on a circumferential track of the first data format;

said second data format including cells each consisting of m bytes, M number of cells being on one circumferential track of the second data format;

wherein N is unequal to M and n is unequal to m;

said system comprising:

said host device, said disk device, and a disk control device connected between said host device and said disk device;

said disk device including at least one disk track having a plurality or cells, each of said cells having a certain number of bytes;

said host device handling data in accordance with said first data format, and said disk control device and said disk device handling data in accordance with said second data format;

said disk control device comprising:

physical cell position data generating means for generating physical cell position data representing a track position and a record position of a cell to be accessed in accordance with said second data format using said M cells and said m bytes, in response to accessing operations by said host device, said disk control device, and said disk device;

logical cell position data generating means for generating logical cell position data representing a track position and a record position of the cell to be accessed in accordance with said first data format using said N cells and said n bytes; and

said disk control device storing said physical cell position data and said logical cell position data on said disk track in accordance with said second data format.

5,590,312

METHOD AND APPARATUS FOR EMULATING CIRCUITRY IN A COMPUTER SYSTEM USING A SYSTEM MANAGEMENT INTERRUPT

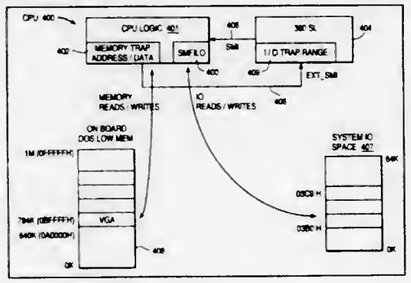
Suresh K. Marisetty, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 987,199, Dec. 7, 1992, abandoned.

This application Jun. 24, 1994, Ser. No. 265,502

Int. Cl.[6] G06F *9/46*

U.S. Cl. 395—500 **8 Claims**



1. A computer system comprising:

a bus;

at least one memory coupled to the bus, wherein the memory stores data and instructions;

a processor having a plurality of pins coupled to the bus, wherein the processor executes a plurality of instructions that comprise an operating system and at least one application program designed to perform accesses to a first circuitry not present in the computer system, and further wherein the processor asserts a signal on a first of the plurality of pins when an access to the first circuitry occurs;

a second circuitry for performing a function; and

a controller coupled to the processor, said controller generating a system management interrupt in response to said signal,

wherein the system management interrupt is transparent to said at least one application program and the operating system;

wherein the processor receives the system management interrupt on a second of the plurality of pins, said processor further comprising

a first trapping mechanism to trap accesses generated by said at least one application program in response to the system management interrupt, and

a system management handler that handles the system management interrupt in an operating environment that underlies the operating system and said at least one application, such that the system management interrupt is handled transparently to the operating system and said at least one application, wherein said system management handler translates accesses generated by said at least one application program that are designated for said first circuitry to be compatible with said second circuitry in response to the system management interrupt, and the system management handler sends converted accesses to the second circuitry for completion and returns to said at least one application while said at least one application program and said operating system are unaware of the first circuitry being emulated by the processor.

5,590,313

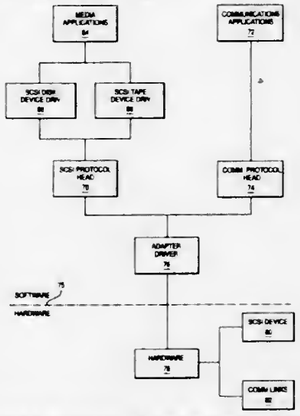
MULTIPLE PROTOCOL DEVICE INTERFACE SUBSYSTEM AND METHOD

Robert A. Reynolds, Pflugerville, and David W. Sheffield, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,338

Int. Cl.[6] G06F *13/14;13/42*

U.S. Cl. 395—500 **10 Claims**



1. A method for interfacing to adapter hardware in a multiprotocol computer system environment having a plurality of different interfaces comprising:

passing from a plurality of different protocol stacks at least two different structures to corresponding different protocol heads, each of said at least two different structures being comprised of a structure for a different interface of said plurality of different interfaces;

generating a common interface structure with said different protocol heads containing pointers to said two different structures so as to accept with said common structure said at least two different structures, said at least two different structures each including a pointer to a buffer address, a pointer to a buffer length, and a cross-memory descriptor; and

passing said common structure to said adapter hardware through said plurality of different interfaces.

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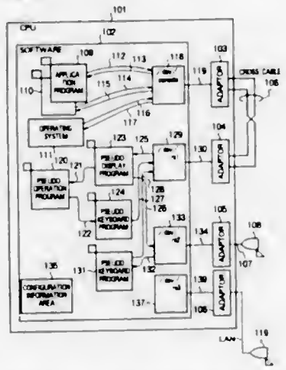
5,590,314

APPARATUS FOR SENDING MESSAGE VIA CABLE BETWEEN PROGRAMS AND PERFORMING AUTOMATIC OPERATION IN RESPONSE TO SENT MESSAGE

Hitoshi Ueno, Zama; Junichi Kazama, Yokohama; Hirofumi Kinoshita, Yokohama, and Masaki Sato, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Software Engineering Co., Ltd., Yokohama, both of Japan

Filed Oct. 11, 1994, Ser. No. 320,676
Claims priority, application Japan, Oct. 18, 1993, 5-259588
Int. Cl.[6] G06F *19/00*
U.S. Cl. 395—681 17 Claims



1. An automated operation machine that can be continued to run by sending back a response to a message given from a program, comprising:

an application program area having an application program;

a first device driver for transmitting via a first interface a console display message addressed from said application program area for automatic operation in a first preselected format for said first interface;

a first adaptor connected to the first device driver, for outputting via a console interface of said first adaptor said console display message in said first preselected format adapted for said console interface;

an operator program memory region having an operator program;

a second device driver for transmitting via a second interface a predetermined operator command from said operator program in correspondence to said console display message;

a second adaptor connected to said second device driver, for outputting via said console interface said operator command in said first preselected format;

a connection cable for mutually connecting said first adaptor with said second adaptor and for transmitting said console display message and said operator command between said first and second device drivers in order to continue said automatic operation in said application program by use of said console display message and said predetermined operator command; and,

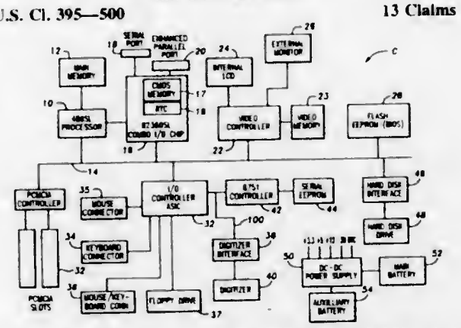
a configuration information area for storing addresses of said first and second device drivers, for indicating to which device driver said application program and said operator program should send said console display message and said predetermined operator command.

5,590,315

METHOD AND APPARATUS FOR SIMULATING USER INPUT DEVICE PRESENCE IN A COMPUTER SYSTEM

Randall L. Hess, Cypress, and Drew S. Johnson, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 119,430, Sep. 10, 1993, abandoned.
This application Dec. 19, 1994, Ser. No. 359,014
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—500 13 Claims



1. A method of simulating user input device presence in a computer system including a processor, a first device port for coupling with a first external physical user input device, and controller circuitry for communicating device command and data characters between the processor and the first device port, the first external physical user input device being capable of assuming a configuration, the method comprising the steps of:

(a) determining whether the first external physical user input device is or is not coupled to the first device port;

(b) if at step (a) it was determined that the first external physical user input device is coupled to the first device port, performing the steps of

(1) sending a device command or data character from the processor to the first device port, and

(2) sending any device command or data character subsequently received from the first device port to the processor; and

(c) if at step (a) it was determined that the first external physical user input device is not coupled to the first device port, performing the steps of

(1) determining whether a device command or data character from the processor requires a response,

(2) if a response was determined to be needed at step (c)(1), sending a device command or data character response from the controller circuitry to the processor,

(3) determining whether the device command or data character from the processor is one of a predetermined number of commands intended to alter the configuration of the first external physical user input device, and

(4) if it was determined at step (c)(3) that the device command or data character is intended to alter the configuration, saving the new configuration of the first external physical user input device.

5,590,316

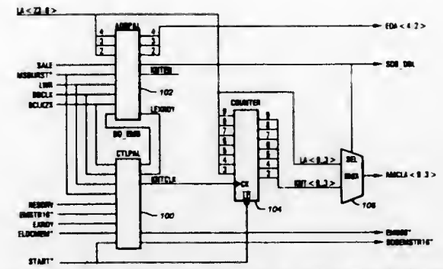
CLOCK DOUBLER AND SMOOTH TRANSFER CIRCUIT

Brian S. Hausauer, 16914 Timberwork Rd., Spring, Tex. 77379

Filed May 19, 1995, Ser. No. 445,184
Int. Cl.[6] G06F *1/04;1/12*
U.S. Cl. 395—556 14 Claims

1. A computer system having a burst transfer cycle for transferring data, comprising:

an expansion bus having a basic clock and control signals, said basic clock having a frequency and rising and falling edges, said control signals indicating the start and the end of the burst transfer cycle;



a fixed frequency multiplier coupled to said basic clock, said fixed frequency multiplier providing a clock having a frequency which is a multiple of the basic clock frequency, said fixed frequency multiplier clock having rising edges aligned with the rising and falling edges of said basic clock;

a decoder, said decoder coupled to said fixed frequency multiplier and to control signals of said expansion bus to detect the start and the end of the burst transfer cycle, said decoder providing a speed-up signal during the burst transfer cycle on the rising edges of said fixed frequency multiplier clock; and

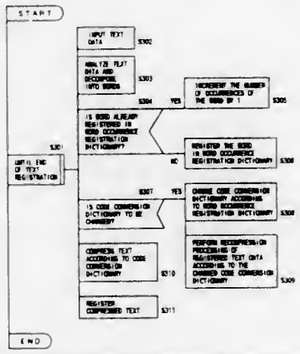
a variable frequency multiplier coupled to said basic clock and said speed-up signal, said variable frequency multiplier multiplying the frequency of said basic clock when said speed-up signal is provided and reproducing the frequency of the basic clock when said speed-up signal is deasserted, said variable frequency multiplier output having rising edges aligned with the rising and falling edges of said basic clock when multiplying the frequency and having rising edges aligned with the rising edges of said basic clock when reproducing the frequency.

5,590,317

DOCUMENT INFORMATION COMPRESSION AND RETRIEVAL SYSTEM AND DOCUMENT INFORMATION REGISTRATION AND RETRIEVAL METHOD

Hiroaki Iguchi, Yokohama; Yasuo Kurosu, Yokosuka; Masaaki Fujinawa, Kanagawa-ken; Yoshihiro Yokoyama, Yokohama, and Hidefumi Masuzaki, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1993, Ser. No. 68,658
Claims priority, application Japan, May 27, 1992, 4-135340; May 27, 1992, 4-135341
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—602 16 Claims



1. A document information compression and retrieval system comprising:

an input section for inputting document information;

a text analysis section which separates the document information consisting of a large number of characters input at said input section into words consisting of one or more characters;

a code conversion dictionary in which pairs of said words and compressed codes corresponding to said words are stored;

a text compression section which makes reference to said code conversion dictionary for converting said words into the compressed codes corresponding thereto;

compressed text storage means for storing the compressed codes of words of said document information compressed by said text compression section as a compressed text;

retrieval information input means for entering key information used to retrieve document information registered in said compressed text storage means;

a text retrieval section which makes reference to said code conversion dictionary for converting said key information into compressed key data corresponding thereto, and retrieves compressed texts including a compressed code identical to said compressed key data stored in said compressed text storage means;

an expansion section which expands the compressed text retrieved by said text retrieval section into document information;

an output section for outputting the document information restored by said expansion section; and

character string registration means for detecting words not registered in said code conversion dictionary from said words into which said document information is separated by said text analysis section, and assigning fixed-length compressed codes to said detected words not registered in said code conversion dictionary in sequence for registering the words in said code conversion dictionary;

wherein said text compression section makes reference to the code conversion dictionary in which words are registered by said character string registration means for converting said words into the compressed codes corresponding thereto;

wherein when a compressed code registration area of said code conversion dictionary is finite, said character string registration means assigns the compressed codes to said detecting words in sequence, and terminates assignment of the compressed codes upon detection of said compressed code registration area becoming full; and

wherein said text compression section, after the termination of assignment of the compressed codes, converts the words already registered in said code conversion dictionary into their corresponding compressed codes, and stores words not registered in said code conversion dictionary in said compressed text storage means without conversion into compressed codes.

5,590,318

METHOD AND SYSTEM FOR TRACKING FILES PENDING PROCESSING

Mark Zbikowski, Woodinville; Brian T. Berkowitz, Bellevue, and Robert I. Ferguson, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Nov. 18, 1993, Ser. No. 154,582
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—618 17 Claims

1. A computer implemented method of restoring data lost from a volatile storage, the computer including a second storage for storing a plurality of files, each file including associated file identifying information which identifies the file, the computer including a processor for processing the files, the method comprising the steps of:

providing update sequence values for files, each update sequence value indicating an order in which the file is to be processed relative to the other files;

storing identifying information for files to be processed by the computer in a portion of the volatile storage;

selecting a next file to be processed by examining the identifying information and update sequence value of files to be processed that are stored in the portion of the volatile storage;

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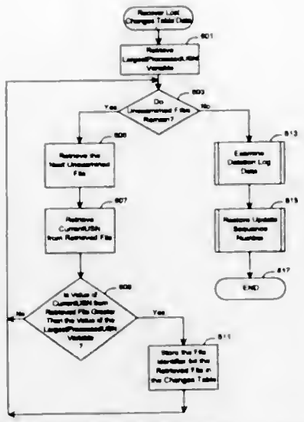


processing the next file to be processed;

providing a threshold value equal to a largest update sequence value for the files that have been processed by the processor; and

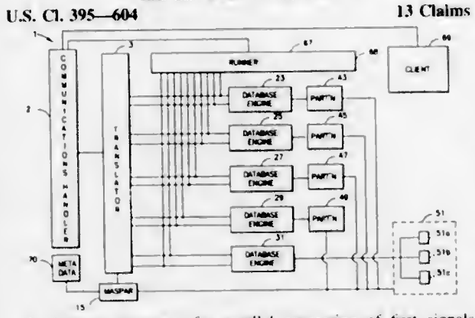
in response to a loss of the file identifiers stored in the portion of the volatile storage, storing in the portion of the volatile storage the file identifier for each file whose update sequence value surpasses the threshold value.

5,590,319
QUERY PROCESSOR FOR PARALLEL PROCESSING IN HOMOGENOUS AND HETEROGENOUS DATABASES

Gerald D. Cohen, New York; Ralph L. Stout, Brooklyn, and Jay H. Edson, Woodside, all of N.Y., assignors to Information Builders, Inc., New York, N.Y.

Filed Dec. 15, 1993, Ser. No. 167,764
Int. Cl.[6] G06F *17/30;13/00*

U.S. Cl. 395—604 **13 Claims**



1. A query processor for parallel processing of first signals indicative of an input query referencing information stored in one or more databases each of which is accessible through an independent database engine, said input query specifying conditions for an answer set of said information, comprising,

translator means for analyzing said first signals and transforming them into second signals representing queries each of which is directed to one or more base tables,

splitter means for receiving said second signals and producing therefrom third signals corresponding to a plurality of separate queries capable of being executed independently and in parallel, each of said separate queries being compatible with one of said database engines, and

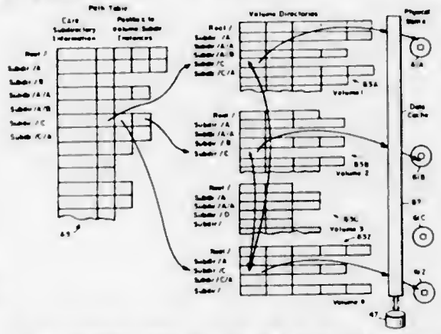
runner means for applying said third signals simultaneously to respective ones of said database engines, receiving, in response thereto, fourth signals generated by each of said database engines which correspond to answer sets for the separate queries, and, producing fifth signals representing an answer set for said input query.

5,590,320
COMPUTER FILE DIRECTORY SYSTEM

David Maxey, Andover, Mass., assignor to Smart Storage, Inc., Andover, Mass.

Filed Sep. 14, 1994, Ser. No. 306,194
Int. Cl.[6] G06F *7/22*

U.S. Cl. 395—619 **5 Claims**



1. In a computer system providing data access to a plurality of individually replaceable physical data volumes each of which contains at least one directory identifying named and timed data files which are contained in the respective volume with the possibility existing that files with the same name may exist on different ones of said volumes with different time indicia; a method of providing, to a user, an aggregated file listing, said method comprising:

generating from said directories respective volume directory tables containing file names and respective media locations where respective file data may be read, said volume directory tables including also

a pointer identifying any next predecessor in time file with the same name if extant in the plurality of physical data volumes, and

a pointer identifying any next superseding in time file with the same name if extant in the plurality of physical data volumes

generating from said directories a path table which provides, for each directory, a logical access path together with a pointer location containing a pointer identifying at least one volume directory table corresponding to a physical volume where the file data may be read,

whereby said listing may be updated when an available volume is changed by updating the respective volume directory table and the related pointers in other volume directory tables without accessing all directories.

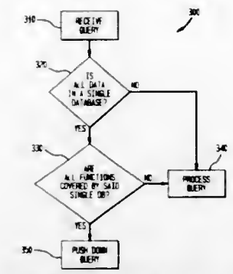
5,590,321
PUSH DOWN OPTIMIZATION IN A DISTRIBUTED, MULTI-DATABASE SYSTEM

Eileen T. Lin, San Jose, and Yun Wang, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 310,797, Sep. 29, 1994. This application Jun. 7, 1995, Ser. No. 475,976
Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—610 **8 Claims**

1. A computer program product comprising a computer readable medium having computer program logic recorded thereon for enabling a computer system to optimize performance of a heterogeneous, distributed database system comprising a plurality of



heterogeneous database management systems, wherein data associated with a client is distributed among said heterogeneous database management systems, said computer program product comprising:

means for evaluating a query for data coverage by determining whether all data referenced in said query is located within a single database instance;

means for evaluating said query for capability coverage by determining whether all capabilities referenced in said query can be performed by said single database instance; and

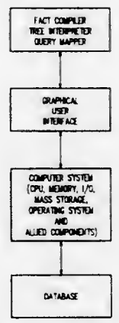
means for pushing down the query to said single database instance if said data coverage and said capability coverage are satisfied.

5,590,322
METHOD AND APPARATUS FOR THE MODELING AND QUERY OF DATABASE STRUCTURES USING NATURAL LANGUAGE-LIKE CONSTRUCTS

James A. Harding, Issaquah, and Jonathan I. McCormack, Renton, both of Wash., assignors to Asymetrix Corporation, Bellevue, Wash.

Continuation of Ser. No. 112,852, Aug. 25, 1993, Pat. No. 5,495,604. This application Jun. 6, 1995, Ser. No. 482,726
Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—604 **27 Claims**



6. Apparatus for the modeling and query of an information system, the apparatus using natural-language like constructs and further comprising:

a programmable computer including memory;

a display device coupled to the computer;

a data entry device, further coupled to the computer;

a graphical user interface implemented on the computer;

a repository further implemented on the computer;

an edit window displayed on the display device for entering text therein, the edit window utilizing the textual form of a computer language having both textual and graphical forms for translating the natural language-like constructs into object-role modeling symbology:

conceptual schema diagram formation means for forming a conceptual schema diagram representing the information system on the display device, the conceptual schema diagram utilizing the graphical form of the computer language having both textual and graphical forms;

drag-and-drop means further implemented on the computer and in operative combination with the display device and the data entry device, for dragging the text from the edit window and for dropping the text item onto the conceptual schema diagram;

parsing means for parsing the text into at least one of object, fact and constraint;

list means, responsive to the parsing means, for creating an object list, a fact list and a constraint list in the repository;

a compiler, in operative combination with the parsing means and the list means, for compiling the text into at least an appropriate one of the object list, the fact list and the constraint list;

drawing means, responsive to the drag-and-drop means and the parsing means for drawing a graphic representation of the text on the conceptual schema diagram using the graphical form of the computer language;

database mapping means, for mapping the conceptual schema to a database;

the edit window, conceptual schema diagram, drag-and-drop means, parsing means, list means, compiler, drawing means, and database mapping means forming in operative combination a drain-and-drop fact compiler for specifying the information system represented in the conceptual schema; and

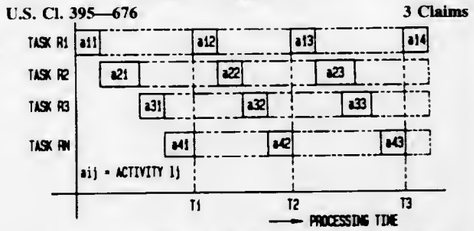
query means for specifying a query to the information system.

5,590,323
OPTIMAL PARALLEL PROCESSOR ARCHITECTURE FOR REAL TIME MULTITASKING

Stamatios V. Kartalopoulos, Clinton Township, Hunterdon County, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 13, 1994, Ser. No. 242,526
Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—676 **3 Claims**



1. A process for defining a parallel processor system having a minimum number of microprocessors necessary to execute in real time a set of tasks of a multi-tasking application such that execution of an activity of a first task is followed by execution of an activity of a second task, comprising the steps of:

(a) selecting an initial number of microprocessors for executing the application in real-time, said selecting step including:

placing in a first column of a matrix all real-time constrained tasks specific to said application; and

associating a row of dependent tasks with each task placed in the first column of the matrix to define a plurality of task subsets, each task subset comprising a maximum number of intradependent tasks and a minimum number of interdependent tasks, and said plurality of task subsets corresponding to the initial number of microprocessors;

(b) listing dependencies between rows in a second column of the matrix;

(c) assigning a priority Pi to each task, where p_i is between 0 and 1;

(d) subdividing at least one of the tasks into discrete activities, each of said activities having a corresponding execution time t_{ij};

(e) estimating the execution time for each activity;

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(f) reducing the number of rows in the matrix by grouping together tasks having activities which can be executed within a predetermined time window T; and

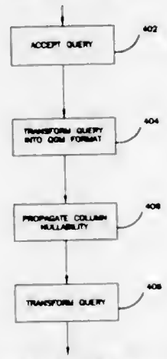
(g) providing a final number of microprocessors corresponding to the number of rows obtained from said reducing step.

5,590,324

OPTIMIZATION OF SQL QUERIES USING UNIVERSAL QUANTIFIERS, SET INTERSECTION, AND MAX/MIN AGGREGATION IN THE PRESENCE OF NULLABLE COLUMNS

Ting Y. Leung; Mir H. Pirahesh; Michelle M. Jou, and David E. Simmen, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1995, Ser. No. 384,925
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—605 **38 Claims**



1. A method of optimizing an SQL query in a computer having a memory, the SQL query being performed by the computer to retrieve data from a relational database stored in an electronic storage device coupled to the computer, the method comprising the steps of:

(a) propagating column nullability values in the memory of the computer through various SQL operations of the query, wherein the column nullability values are selected from a group comprising null, non-null, and nullable; and

(b) optimizing the SQL operations of the query in the memory of the computer based on the propagated column nullability values.

5,590,325

SYSTEM FOR FORMING QUERIES TO A COMMODITIES TRADING DATABASE USING ANALOG INDICATORS

Anthony D. Kolton, Chicago, Ill.; Ruben A. Gamboa, and Danette S. Chimenti, both of Austin, Tex., assignors to Logical Information Machines, Inc., Chicago, Ill.

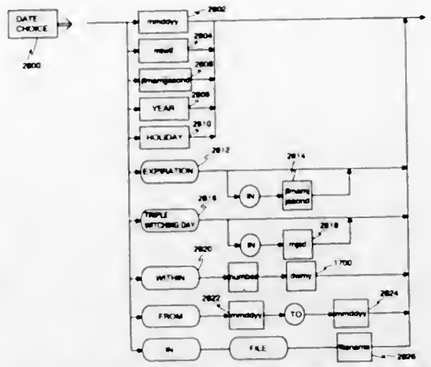
Continuation of Ser. No. 713,359, Jun. 11, 1991, abandoned.
This application Feb. 22, 1995, Ser. No. 392,612
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—615 **18 Claims**

1. A system for generating queries suitable for retrieving data from a database including a sequential history of commodity attributes, comprising:

a display,

a pointer device having a corresponding rendition on said display for choosing selections presented on said display,

an event definition window sequence presented on said monitor having selections responsive to said pointer, for defining an event as one or more analog indicators from market attributes comprising: market indicators, commodities, equities, transac-



tion price, transaction volume, date, time, and the like for defining time correlated analog characteristics indicative of correlated analog characteristics indicative of a point in the sequential history when a temporal relation imposed upon selected market attributes is satisfied, and

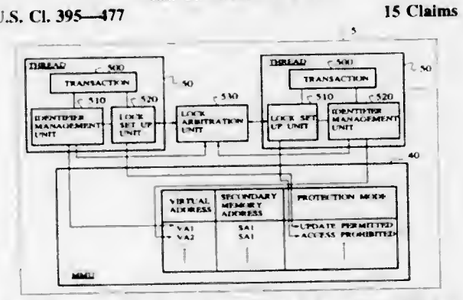
a report definition window sequence presented on said display having selections responsive to said pointer, for defining a set of analog markets, for each point in history corresponding to the satisfaction of said one or more analog indicators as one or more time-series defining the current market being temporally related to said event to be retrieved from said database allowing comparison of report presentations for identifying recurring trends as defined by patterns relating to historical antecedents to find periods with similar characteristics.

5,590,326

SHARED DATA MANAGEMENT SCHEME USING SHARED DATA LOCKS FOR MULTI-THREADING

Toshihiko Manabe, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1994, Ser. No. 305,354
Claims priority, application Japan, Sep. 13, 1993, 5-226816
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—477 **15 Claims**



1. A method for managing shared data to be accessed by multiple threads, comprising the steps of:

assigning different shared data identifiers, for identical shared data, to different threads, said different shared data identifiers to be used in identifying the shared data at a time of making accesses to the shared data;

setting up different locks for said different shared data identifiers assigned at the assigning step; and

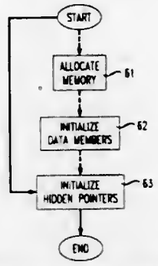
detecting an access to the shared data in violation of at least one of the locks set up at the setting step among the accesses to the shared data made from the threads, said detecting being in accordance with the shared data identifiers assigned at the assigning step.

5,590,327

METHOD FOR MAKING DATA OBJECTS HAVING HIDDEN POINTERS PERSISTENT

Alexandros Biliris, Arlington, Mass.; Shaul Dar, Madison, Wis., and Narain H. Gehani, Summit, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 40,327, Mar. 30, 1993, abandoned.
This application Nov. 22, 1994, Ser. No. 343,735
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—670 **22 Claims**



1. An automated method performed by a data processing system for processing a preexisting data object, the data object having a pointer for use in providing memory access to information associated with the data object, the pointer having become invalid, said method comprising the steps of

determining a location of said associated information in a memory; and

changing said invalid pointer to refer to the determined location in the memory,

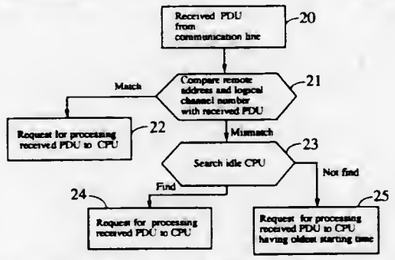
wherein said changing step comprises applying a modified object creation process to said preexisting data object to perform said changing of said invalid pointer, wherein an object creation process has been modified to form said modified object creation process, said object creation process comprising the steps of allocating memory space in a memory for a data object being created, initializing data within said data object being created, and initializing pointers within said data object being created, and wherein said modification comprises selectively inhibiting said step of allocating memory space and said step of initializing data.

5,590,328

PROTOCOL PARALLEL PROCESSING APPARATUS HAVING A PLURALITY OF CPUS ALLOCATED TO PROCESS HIERARCHICAL PROTOCOLS

Shoichiro Seno, and Tetsuo Ideguchi, both of Kanagawa-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 907,833, Jul. 2, 1992, abandoned.
This application Mar. 6, 1995, Ser. No. 399,331
Claims priority, application Japan, Jul. 25, 1991, 3-208558
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—675 **20 Claims**



1. A protocol parallel processing apparatus, comprising:

a plurality of CPUs for processing a plurality of protocol data units;

a shared memory accessible by each of the plurality of CPUs for storing a CPU state table, that associates each of the plurality of CPUs with an idle flag indicative of whether a CPU is currently processing a protocol data unit, a remote address indicative of a remote node identified by a protocol data unit, and a process start time indicative of a time at which each CPU begins processing a protocol data unit; and

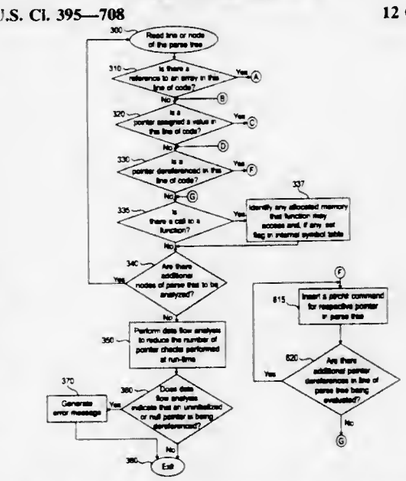
at least one line interface, coupled to the shared memory, including means for writing a remote address into the CPU state table when a protocol data unit is processed, and means for requesting one of the plurality of CPUs whose idle flag indicates that the CPU is idle to process the protocol data unit, and, means operative when no CPU is idle, for requesting a CPU with an oldest process start time to process the protocol data unit if none of the plurality of CPUs is idle.

5,590,329

METHOD AND APPARATUS FOR DETECTING MEMORY ACCESS ERRORS

James E. Goodnow, II, Grass Valley, Calif.; Thaddeus J. Kowalski, Summit, and James R. Rowland, Short Hills, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 4, 1994, Ser. No. 192,239
Int. Cl.[6] G06F *11/08*
U.S. Cl. 395—708 **12 Claims**



1. A method of generating executable code for a program from source code for the program, the executable code including pointer checking code which checks memory references made by dereferencing pointers, the method comprising the steps of:

performing an analysis based on the source code to identify certain memory references which are made by dereferencing pointers and which need not be checked; and.

responding to the analysis by generating the executable code without pointer checking code that checks the certain memory references.

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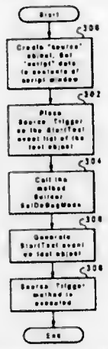
5,590,330

METHOD AND SYSTEM FOR PROVIDING A TESTING FACILITY IN A PROGRAM DEVELOPMENT TOOL

Nurcan Coskun, and Bruce A. Tate, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1994, Ser. No. 354,695
Int. Cl.[6] G06F *9/45;3/14*
U.S. Cl. 395—704 **12 Claims**



1. A method for providing a testing facility in a program development tool within a data processing system, said method comprising:

associating a dictionary object with each static object constructed by a user within said program development tool for a program being developed, wherein said dictionary object includes an event list and a method list;

adding a method entry to said method list within said dictionary object in response to each action object constructed by a user within said program development tool for said program being developed; and

in response to an association of a static object with an action object utilizing an event key selected by a user within said program development tool, associating an event key in said event list which corresponds to said selected event key with a method entry in said method list which corresponds to said action object, such that the effect of said action object on said static object can be tested via a triggering of said action object by a user within said program development tool independent of the status of all other static objects within said program being developed.

5,590,331

METHOD AND APPARATUS FOR GENERATING PLATFORM-STANDARD OBJECT FILES CONTAINING MACHINE-INDEPENDENT CODE

Brian T. Lewis, and Theodore C. Goldstein, both of Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 23, 1994, Ser. No. 363,743
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—708 **21 Claims**

1. A method for generating a platform-standard object file, the method comprising the steps of:

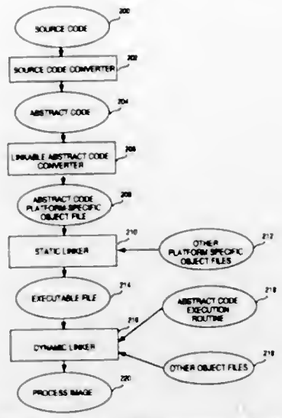
a) providing a machine-independent software module, wherein the machine-independent software module contains abstract code defining at least one procedure;

b) analyzing said abstract code to determine whether any global variables are defined in said machine-independent software module;

c) if any global variables are defined in said machine-independent software module, then

c1) generating a list of definitions of said any global variables;

c2) storing said list of definitions in said platform-standard object file;



d) analyzing said abstract code to determine whether said at least one procedure references any external variables or external procedures;

e) if said at least one procedure references any external variables or external procedures, then

e1) generating a list of symbol references indicative of said any external variables or external procedures;

e2) storing said list of symbol references in said platform-standard object file;

f) generating a sequence of machine instructions for calling an execution routine when a client calls said at least one procedure;

g) storing said sequence of machine instructions in said platform-standard object file; and

h) storing said abstract code in said platform-standard object file.

5,590,332

GARBAGE COLLECTION, TAIL RECURSION AND FIRST-CLASS CONTINUATIONS IN STACK-ORIENTED LANGUAGES

Henry G. Baker, 16231 Meadow Ridge Way, Encino, Calif. 91436

Filed Jan. 13, 1995, Ser. No. 372,514
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—705 **18 Claims**

1. A method for executing an advanced application, said application comprising a number of related subprograms implemented in a stack-oriented language which includes both a stack and a heap, comprising the steps of:

converting one or more of said application subprograms into continuation-passing style (CPS) in the stack-oriented language;

determining the extent and limit points of a stack buffer on the execution stack of the stack-oriented language, which buffer is capable of holding a plurality of invocation stack frames;

commencing the execution of the application such that the initial invocation stack frame is within the limits of the stack buffer;

interrupting any of said CPS-converted subprograms when the execution stack pointer is beyond a limit point of the stack buffer;

initiating an evacuation process to transport out of the stack buffer into the heap any live data objects found in the stack buffer;

contracting the execution stack of the stack-oriented language back to the beginning of the stack buffer; and

resuming the execution of the interrupted CPS-converted subprogram.

5,590,333

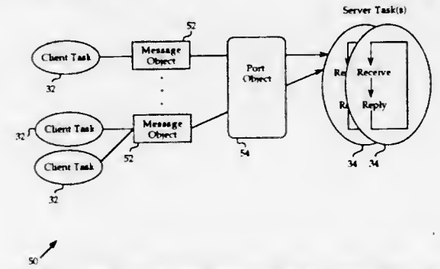
Patent Not Issued For This Number

5,590,334

OBJECT ORIENTED MESSAGE PASSING SYSTEM AND METHOD

Thomas E. Saulpaugh, San Jose; Bill M. Bruffey, Cupertino, and Russell T. Williams, San Jose, all of Calif., assignors to Apple Computer, Inc, Cupertino, Calif.

Continuation of Ser. No. 220,043, Mar. 30, 1994, abandoned. This application Mar. 19, 1996, Ser. No. 618,404
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—683 **15 Claims**



1. A computer-implemented message passing method for a computer system having a processing trait and a memory wherein a plurality of client tasks, a plurality of server tasks and a message passing unit reside, each client task comprising a sequence of program instructions that require a service, each server task comprising a sequence of program instructions capable of providing a service, the message passing unit comprising a sequence of program instructions that manages the transfer of messages between client tasks and server tasks, each client task, each server task, and the message passing unit executable by the processing unit, the message passing method comprising the steps of:

creating a plurality of message object data structures with the message passing unit, each message object data structure corresponding to a type of service provided by at least one server task within the plurality of server tasks, each message object data structure serving as a message destination from the perspective of a client task within the plurality of client tasks and to which a client task within the plurality of client tasks issues a send message request for the purpose of requesting a particular type of service be performed upon a message;

creating a port object data structure with the message passing unit, the port object data structure associated with the plurality of message data structures, the port object data structure corresponding to a receptacle for messages directed to each message object data structure within the plurality of message object data structures and to which each server task within the plurality of server tasks issues a receive message request for the purpose of polling for a message;

issuing a send message request with a first client task within the plurality of client tasks, the send message request including a reference to a first message and a reference to a message object data structure within the plurality of message object data structures;

receiving the send message request with the message passing unit;

transferring the first message to the port object data structure with the message passing unit;

polling the port object data structure with a first server task within the plurality of server tasks; and

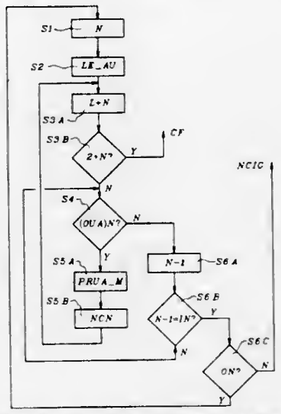
transferring the first message to the first server task with the message passing unit.

5,590,335

PROCESS FOR ANALYSIS OF DEADLOCKS IN AN OPERATING SYSTEM

Jean-Paul Dubourreau, Biviers, and Thierry Jacquin, Echirolles, both of France, assignors to Bull S.A., Puteaux, France

Continuation of Ser. No. 263,082, Jun. 21, 1994. This application Apr. 2, 1996, Ser. No. 626,597
Claims priority, application France, Aug. 3, 1993, 93 09533
Int. Cl.[6] G06F *15/16*
U.S. Cl. 393—704 **8 Claims**



1. A process for analyzing deadlocks in an operating system of a machine comprising a symmetrical multiprocessor operating in a UNIX environment, said process implemented by iteratively executing a specific function for tracing a thread from any one of plural processors in said symmetrical multiprocessor to any type of lock, said process comprising:

searching all processors of said symmetrical multiprocessor for and identifying a waiting thread stopped on a lock or waiting for a holding signal from an element of said machine;

searching for and identifying a holding thread that holds said lock or said holding signal from said element of said machine; and

when said holding thread is itself waiting for another lock, repeating the previous process steps through chains of interrelated threads and locks until a cycle is identified,

wherein said function makes it possible to reconstruct a deadlock, and hence a cycle, element by element.

5,590,336

METHOD AND APPARATUS FOR PERFORMING OVERLAPPING SERVICE OF MULTIPLE IDE PERIPHERAL DEVICES

William G. Parry, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Oct. 25, 1994, Ser. No. 328,481
Int. Cl.[6] G06F *9/46;13/22*
U.S. Cl. 395—727 **31 Claims**

1. A method for performing overlapping service of requests from a computer to multiple peripheral devices connected to the computer, wherein each request includes a seek and a data transfer operation and wherein the time required for a first peripheral device to complete a seek operation is longer than the time required for a second peripheral device to complete a seek operation, said method comprising the steps of:

initiating a seek operation for the first peripheral device in response to a request from the computer to the first peripheral device;

starting a timer;

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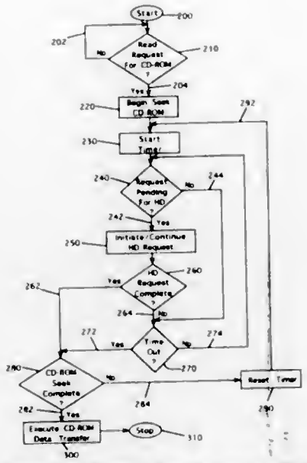


initiating execution of a request from the computer to the second peripheral device;

determining whether the first peripheral device has completed its seek operation when the timer times out;

executing a data transfer operation for the first peripheral device if the first peripheral device has completed its seek operation;

resetting the timer and returning to said step of starting the timer if the first peripheral device has not completed its seek operation.

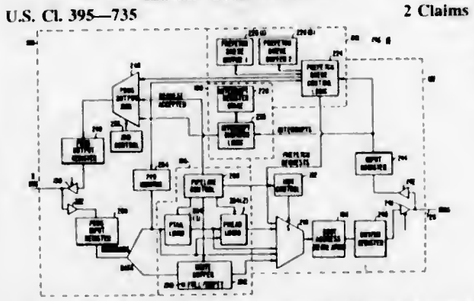
5,590,337

PROCESSOR INTERFACE CHIP FOR DUAL-MICROPROCESSOR PROCESSOR SYSTEM

Mizanur M. Rahman, Cupertino; Fred C. Sabernick, Sunnyvale; Jeff A. Sprouse, Mountain View; Martin J. Grosz, Santa Clara; Peter Fu, Sunnyvale, and Russell M. Rector, Oakland, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Division of Ser. No. 88,562, Jul. 6, 1993, Pat. No. 5,435,001.
This application Apr. 21, 1995, Ser. No. 426,365
Int. Cl.[6] G06F *9/46;13/14*

U.S. Cl. 395—735 **2 Claims**



1. An interrupt processing apparatus, wherein a microprocessor receives interrupt signals from a plurality of interrupt sources over a processor bus, wherein the interrupt signals set or reset interrupt flags in an interrupt register of the microprocessor and the microprocessor acts on the state of the interrupt flags, the interrupt processing apparatus comprising:

an interrupt image register, wherein said interrupt image register stores data indicative of states of the interrupt flags in the interrupt image register; and

interrupt filtering means, coupled between the processor bus and the plurality of interrupt sources and coupled to the interrupt image register, for receiving interrupt signals and preventing the transfer of interrupt signals over the processor bus which do not change the state of the interrupt register, said interrupt filtering means comparing said received interrupt signals and contents of said interrupt image register to determine if said signal is a signal which would change the state of the interrupt register.

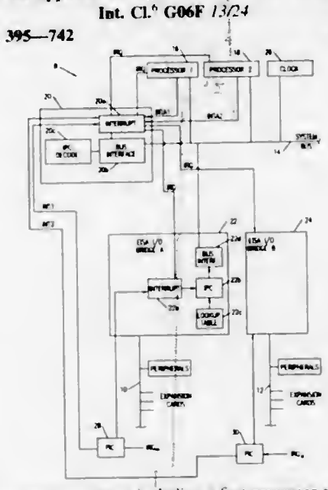
5,590,338

COMBINED MULTIPROCESSOR INTERRUPT CONTROLLER AND INTERPROCESSOR COMMUNICATION MECHANISM

Terry J. Parks, Round Rock, and Darius D. Gaskins, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 96,588, Jul. 23, 1993, abandoned.
This application Aug. 8, 1995, Ser. No. 512,867
Int. Cl.[6] G06F *13/24*

U.S. Cl. 395—742 **10 Claims**



1. In a computer system including a first processor and a second processor, said computer system having a programmable interrupt controller for receiving a processor-associated vector and for correspondingly generating an interrupt request, a combined multiprocessor interrupt controller and interprocessor communication system comprising:

a system bus;

an input/output bridge element coupled to said system bus, said input/output bridge element comprising

interrupt circuitry for receiving said interrupt request and for obtaining said processor-associated vector from said programmable interrupt controller, and

circuitry for packaging said processor-associated vector into an interprocessor communication message and for providing said interprocessor communication message onto said system bus; and

a system controller coupled to said system bus, said system controller comprising

bus interface circuitry for receiving said interprocessor communication message from said input/output bridge element through said system bus, and

decode circuitry for decoding said interprocessor communication message and retrieving said processor-associated vector,

wherein said bus interface circuitry further provides said processor-associated vector to one of said first and second processors.

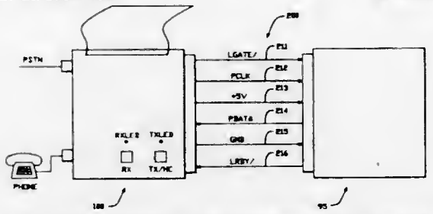
5,590,339

INPUT DEVICE INTERFACE WITH POWER CONNECT STATE AND SERIAL DATA CHANNEL ENABLING POWER TO THE DEVICE FROM TIME TO TIME

Hershow Chang, Hsin-Chu, Taiwan, assignor to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Aug. 23, 1993, Ser. No. 110,533
Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **18 Claims**



1. An interface between a host and an input device, comprising:

a plurality of signal lines for connecting the input device to the host, including a power supply line, a data transmission line, a control signal transmitting line and a control signal receiving line;

power supply in communication with said power supply line for supplying power over said power supply line to the input device;

a data transmission channel coupled to said data transmission line for receiving data from the input device and for transferring the received data to the host; and

control logic coupled to the host and said power supply for enabling the supply of power over said power supply line to the input device from time to time, and monitoring said control signal receiving line to maintain the supply of power until a time out occurs, or until a data transfer on said data transmission channel ends.

5,590,340

APPARATUS AND METHOD FOR SUSPENDING AND RESUMING SOFTWARE APPLICATION ON A COMPUTER

Mitsuaki Morita, Hirakata; Masaya Miyazaki, Ikeda; Nobuyuki Enoki, Kadoma, and Akira Takuma, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 895,812, Jun. 9, 1992, abandoned.
This application Apr. 1, 1994, Ser. No. 221,993
Claims priority, application Japan, Jun. 10, 1991, 3-137484
Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **10 Claims**

1. A control unit of a computer system comprising:

power supply means for supplying power to the computer system;

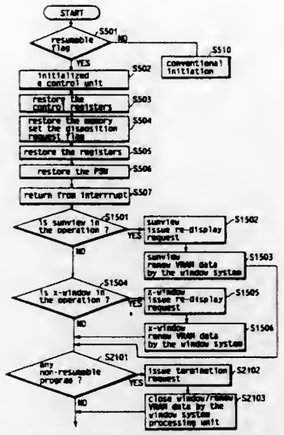
first storing means serving as a CPU's register, and input/output controlling device's register, and a volatile memory for holding written data while power is being supplied, said volatile memory's data includes graphic display data for generating a graphic display signal, and original graphic display data for generating the graphic display data;

second storing means for holding the data with no use of power;

a power switch for selectively outputting one of an ON signal and an OFF signal in accordance with the selection of an operator;

power-off preserving means for selectively transferring data related to the original graphic display data from the first storing means to the second storing means while leaving the graphic display data in the first storing means, data read out from the first storing means being stored in the second storing means by said transferring operation;

power-off preserving controlling means for detecting the OFF signal from the power switch to instruct the power-off preserving means to initiate said transferring operation;



power supply stopping means for instructing the power supply means to stop the power supply when detecting the completion of said transferring operation;

window system processing means for refreshing the graphic display by generating the graphic display data based on the original graphic display data held in the second storing means and by storing it in the first storing means;

refresh requesting means for requesting the window system processing means to refresh the graphic display;

power supply restarting means for instructing the power supply means to restart the supply of the power by detecting the ON signal from the power switch;

power-on resuming means for reading out the data stored in the second storing means to return them to the first storing means;

resuming means for the graphic display data for resuming the graphic display data based on the original graphic display data returned to the first storing means as well as storing the resumed graphic display data in the first storing means; and

power-on controlling means for instructing the power-on resuming means to execute said transferring by detecting the ON signal from the power switch, and for instructing the refresh requesting means to request the refresh operation.

5,590,341

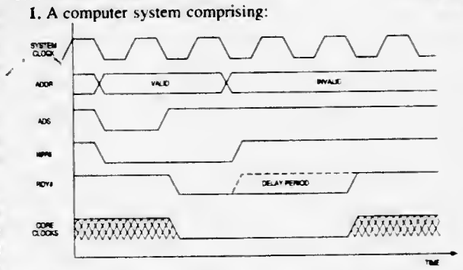
METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN A COMPUTER SYSTEM USING READY DELAY

Eugene P. Matter, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 30, 1994, Ser. No. 316,547
Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—750 **21 Claims**

1. A computer system comprising:



a bus;

a memory coupled to the bus to store data and instructions;

a processor coupled to the bus for executing said instructions, wherein the processor performs bus cycles on the bus in

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response to executing said instructions, and further wherein the processor enters a reduced power consumption state while at least one bus cycle is being performed and exits the reduced power consumption state upon completion of said at least one bus cycle; and

a controller coupled to the bus to monitor bus cycles from the processor, wherein the controller indicates completion of bus cycles to the processor using a completion indication coupled to the processor, wherein the controller withholds the completion indication for a period of time after completion of said at least one bus cycle to control power consumption by the processor, such that power consumption in the processor is reduced within an instruction boundary.

5,590,342

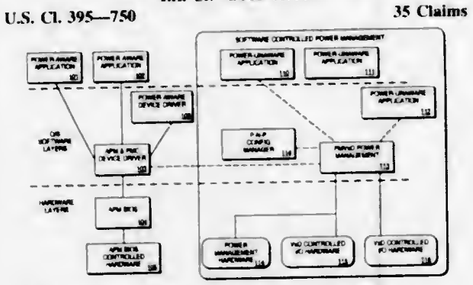
METHOD AND APPARATUS FOR REDUCING POWER CONSUMPTION IN A COMPUTER SYSTEM USING VIRTUAL DEVICE DRIVERS

Suresh K. Marisetty, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 29, 1994, Ser. No. 346,040

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—750 **35 Claims**



11. A computer system comprising:

a bus;

a central processing unit (CPU) coupled to the bus running an operating system and at least one power-unaware application, wherein the operating system has a virtual device driver performing device idle detection using one or more events timers indicating the activity level of at least one local device, and further wherein the virtual device driver places idle local devices in a reduced power consumption state when associated events timers indicate that no activity has occurred for a predetermined period of time transparent to said at least one power-unaware application.

5,590,343

TOUCH-SENSITIVE SWITCHING CIRCUITRY FOR POWER-UP

Michael L. Bolan, Dallas, and Wendell L. Little, Denton, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 87,239, Aug. 20, 1993, abandoned, which is a division of Ser. No. 998,897, Dec. 28, 1992, Pat. No. 5,249,298, which is a continuation-in-part of Ser. No. 283,268, Dec. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 282,793, Dec. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 283,267, Dec. 9, 1988, abandoned. This application Jul. 19, 1995, Ser. No. 504,228

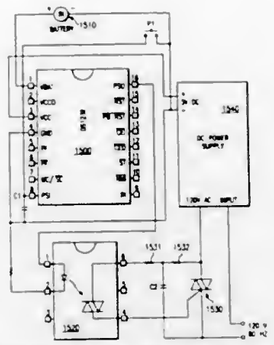
Int. Cl.[6] G06F *1/30; 1/32*

U.S. Cl. 395—750 **21 Claims**

1. A circuit, for connection to an external contact pad, comprising:

a battery;

a power supply connected to receive current from an AC line;



a switch separate from said battery, said switch connected to disconnect said power supply from said AC line;

logic connected to detect a voltage transition on said external contact pad, such as may be caused when a user touches said external contact pad, and to selectively operate said switch when said voltage transition is detected, said logic being connected to be operated from said battery when said power supply is inoperative; and

at least one microprocessor connected to be powered by said power supply, wherein said external contact pad is electrically isolated from said power supply.

5,590,344

Patent Not Issued For This Number

5,590,345

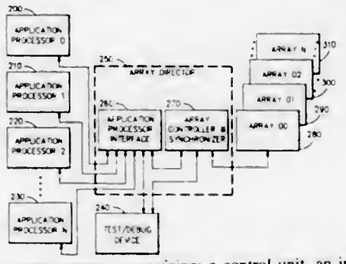
ADVANCED PARALLEL ARRAY PROCESSOR(APAP)

Thomas N. Barker, Vestal; Clive A. Collins, Poughkeepsie; Michael C. Dapp, Endwell; James W. Dieffenderfer, Owego; Donald G. Grice, Kingston; Peter M. Kogge, Endicott; David C. Kuchinski, Owego; Billy J. Knowles, Kingston; Donald M. Lesmeister, Vestal; Richard E. Miles; Richard E. Nier, both of Apalachin, all of N.Y.; Eric E. Retter, Warren Center, Pa.; Robert R. Richardson, Vestal, N.Y.; David B. Rolfe, West Hurley, N.Y.; Nicholas J. Schoonover, Tioga Center, N.Y.; Vincent J. Smoral; James R. Stupp, both of Endwell, N.Y., and Paul A. Wilkinson, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 611,594, Nov. 13, 1990, abandoned, and Ser. No. 798,788, Nov. 27, 1991, abandoned, and Ser. No. 698,866, May 31, 1991, Pat. No. 5,313,645. This application May 22, 1992, Ser. No. 887,630

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **2 Claims**



1. A computer system, comprising: a control unit, an interconnection system and a processing array for parallel processing

having nodes which are interconnected with the distribution system to other processing nodes, wherein: the control unit is programmable and has means for enabling the processing array having an array of processing elements to operate in coordination and which also enables a system control program to operate subsets of the parallel array with each subset dedicated to different applications or different phases of a single application program's processing, wherein

the interconnection system provides physical connections between the control unit and the elements of the parallel array of processing elements enabling data and control transfers which are completely independent of the transfer of data between elements of the processing array,

the interconnection system distributes functions associated with data transfer between elements of the processing array and distributed functions embedded in processing node software, and

the processing array provides non-shared memory and compute services and which are partitioned and the processing array is scalable

wherein the control unit and interconnection system provide

means, including a broadcast bus path, for broadcasting data and instructions to the parallel array, for accumulating data and status information from the elements of the array, for generating and accepting status information which represents the union of the status derived from the elements of the array, and for controlling how elements of the parallel array interact with the broadcast bus path,

means for continuously and unobtrusively accumulating status from individual processing elements to facilitate programmer testing and tuning,

means for partitioning the elements of the array into subgroups that are controlled by interleaved commands and data transfers where:

subgroup size is specified by the application and/or system operating program and ranges from a single processing unit to the assembly of all processing units, subgroups may be assembled from any particular set of elements of the parallel array irregardless of the particular address information associated with the specific elements,

means for generating program specified cross sections of the parallel array for assembly into partitions,

means for associating with each command or data, tag information to control which partition should receive the data,

means for writing to registers within the processor elements of the parallel array data specifying which partition code will be used to address the individual element,

means for writing commands and data to the elements of the parallel array which are passed to the units irrespective of the current status of the partition data within any particular element of the parallel array,

means for providing to elements of the parallel array a broadcast facility to all or subsets of the parallel array data specified by the application and/or system operating program, and such operations comprise sequential action of:

means for permitting all or a subset of the elements in the parallel array to signal the need for the broadcast,

means for accumulating and prioritizing broadcast requests,

means for causing the performance of a broadcast operation sequence,

means for initializing parallel processor system operations and for providing additional program loads when directed by an application and/or system operating program.

5,590,346

ANTENNA CAP FOR COMPUTER DEVICE UTILIZING A RADIO CARD

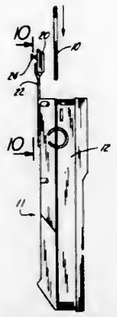
Guy J. West, and Ronald L. Mahany, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Filed Jul. 26, 1993, Ser. No. 97,462

Int. Cl.[6] G06F *1/16*

U.S. Cl. 395—800 **24 Claims**

1. A computer device comprising:



a radio card having a radio card electrical interface and radio card antenna contacts disposed thereon;

a housing having an external surface, wherein said external surface includes an opening having a periphery;

a second electrical interface disposed within the opening of said housing;

said radio card electrical interface communicatively coupling with said second electrical interface upon insertion of said radio card through the opening of said housing;

a cap sized to engage said opening of said housing;

cap antenna contacts disposed on said cap to communicatively couple with said radio card antenna contacts upon engaging said cap with said opening of said housing; and

a first antenna connected to said cap antenna contacts.

5,590,347

METHOD AND SYSTEM FOR SPECIFYING ALTERNATE BEHAVIOR OF A SOFTWARE SYSTEM USING ALTERNATE BEHAVIOR INDICIA

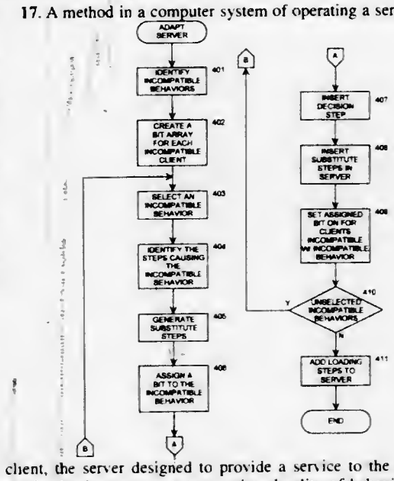
David J. D'Souza, Kirkland; Neil Konzen, Bellevue, and David N. Weise, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 7, 1992, Ser. No. 987,363

Int. Cl.[6] G06F *9/445*

U.S. Cl. 395—800 **31 Claims**

17. A method in a computer system of operating a server with a



client, the server designed to provide a service to the client, the service having common steps and a plurality of behavior groups, each of the behavior groups including one or more alternative behaviors, each alternative behavior having a series of steps, the method comprising the steps of:

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associating a plurality of indications with the client, each of the indications associated with one of the behavior groups and indicating the alternative behavior in that behavior group with which the client is compatible;

under control of the client, requesting the service provided by the server; and

under control of the server, executing the common steps; and

for each of the behavior groups, determining the alternative behavior of that behavior group with which the client is compatible using the indication associated with that behavior group; and

executing the steps of the determined alternative behavior.

5,590,348

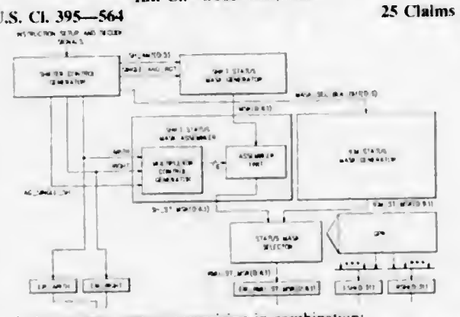
STATUS PREDICTOR FOR COMBINED SHIFTER-ROTATE/MERGE UNIT

James E. Phillips, Binghamton; Bartholomew Blaner, Newark Valley, and Stamatis Vassiliadis, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1992, Ser. No. 920,962

Int. Cl.[6] G06F *9/00; 5/00*

U.S. Cl. 395—564 **25 Claims**



1. A computer system comprising in combination:

a combination shift-rotate/merge functional unit having input operands comprised of a left half and right half parts,

an instruction decode and issue means for decoding and issuing instructions to the functional unit,

said functional unit comprising means responsive to said instructions to carry out a shift function to shift the bits of one or more of said operands to more or less significant bit positions, and to carry out a merge function to merge said operands,

a status mask generator responsive to said instructions to generate a status mask, and

a status generator responsive to said status mask and said operands to predict the status of the result to be produced by said functional unit in response to said instructions, said status including a status condition which depends upon said shift function and a status condition which depends upon said merge function.

5,590,349

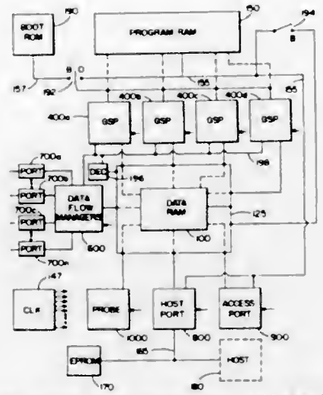
REAL TIME PROGRAMMABLE SIGNAL PROCESSOR ARCHITECTURE

Jeffrey I. Robinson, New Fairfield; Keith Rouse, Oxford, both of Conn., and Bruce R. Musicus, Arlington, Mass., assignors to Logic Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 525,977, May 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 217,616, Jul. 11, 1988, Pat. No. 5,068,823. This application Jun. 18, 1992, Ser. No. 900,536

Int. Cl.[6] G06F *15/173*

U.S. Cl. 395—800 **87 Claims**



1. A programmable, real time, signal processor apparatus designed for semiconductor integration, which receives regularly clocked data signals from means external said signal processor apparatus, and processes said data signals in a real time fashion, thereby generating processed data signals which are available external to said processor apparatus as regularly clocked output signals, comprising:

a) at least one data signal receiving means for receiving said regularly clocked data signals from said means external said signal processor apparatus;

b) a multiported central memory unit coupled to said data signal receiving means for storing said received data signals, said data signal receiving means including means for regularly forwarding said received data signals to desired locations in said multiported central memory unit;

c) a plurality of digital processor means coupled to said multiported central memory unit, for obtaining said data signals from said multiported central memory unit, for processing said data signals thereby generating processed data signals, and for sending said processed data signals for storage in said multiported central memory unit;

d) a program memory means coupled to said plurality of digital processors for storing microinstructions for said plurality of digital processors, wherein said digital processors process said data signals according to said microinstructions stored in said program memory means;

e) at least one output port coupled to said multiported central memory unit for obtaining said processed data signals from said multiported central memory unit and providing said processed data signals as regularly clocked output signals to means external to said processor apparatus; and

f) at least one data bus coupling said plurality of digital processor means, said at least one output port, and said at least one data signal receiving means to said multiported central memory unit, wherein substantially all data received by said data receiving means is forwarded via said at least one data bus to said multiported central memory unit, obtained from said multiported central memory unit via said at least one data bus and processed by at least one of said plurality of digital processor means to generate said processed data signals, and said processed data signals are forwarded via said at least one data bus to said multiported cental memory unit for either obtaining via said at least one data bus by at least one of said plurality of digital processor means for additional processing or for obtaining via said at least one data bus and output by said at least one output port as a regularly clocked output signal at a rate related to the rate of said received regularly clocked data signals.

5,590,350

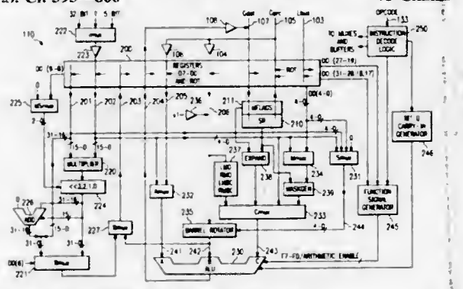
THREE INPUT ARITHMETIC LOGIC UNIT WITH MASK GENERATOR

Karl M. Guttag, Missouri City, Tex.; Keith Balmer, Bedford, England; Robert J. Gove, Plano, Tex.; Christopher J. Read, Houston, Tex.; Jeremiah E. Golston, Sugar Land, Tex.; Sydney W. Poland, Katy, Tex.; Nicholas Ing-Simmons, Alconbury Weston, and Philip Moyse, Bromham, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1993, Ser. No. 159,282

Int. Cl.[6] G06F *9/00;* **H03K** *19/00*

U.S. Cl. 395—800 **75 Claims**



1. A data processing apparatus comprising:

an arithmetic logic unit having first, second and third data inputs for multibit digital signals representing corresponding first, second and third input signals, and a function control input signal for receiving a function signal, said arithmetic logic unit generating at an output a multibit digital signal representing a mixed arithmetic and Boolean combination of said first, second and third inputs corresponding to said function signal, said mixed arithmetic and Boolean combination including at least one combination performing a Boolean function prior to an arithmetic function;

a first data source supplying a first multibit digital signal to said first data input of said arithmetic logic unit;

a second data source supplying a second multibit digital signal to said second data input of said arithmetic logic unit;

a third data source supplying a third multibit digital signal;

a mask generator having a data input connected to said third data source and a data output connected to said third data input of said arithmetic logic unit, said mask generator generating a multibit digital mask signal corresponding to said third multibit digital signal.

5,590,351

SUPERSCALAR EXECUTION UNIT FOR SEQUENTIAL INSTRUCTION POINTER UPDATES AND SEGMENT LIMIT CHECKS

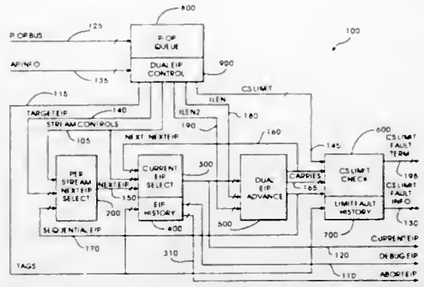
Elliot A. Sowadsky, Santa Clara; Larry Widigen, Salinas; David L. Puziol, Sunnyvale, and Korbin S. Van Dyke, Fremont, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 21, 1994, Ser. No. 185,488

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **20 Claims**

17. A sequential instruction pointer execution unit for a processor that executes instructions, said instructions including branch instructions, said branch instructions having respectively associated not-taken-direction and taken-direction control flow paths, said taken-direction control flow paths also being referred to as instruction streams, said processor tracking a plurality of said instruction streams, said sequential instruction pointer execution unit being one type of a plurality of types of execution units within said processor, said sequential instruction pointer execution unit performing superscalar instruction pointer updates for a plurality of sequential operations, said operations being associated with said instructions, said sequential instruction pointer execution unit



executing at least some of said plurality of sequential operations speculatively, said sequential instruction pointer execution unit comprising:

(a) first storage for a first and a second of said plurality of operations, said second operation being sequential to said first operation, said first and second operations having respective first and second instruction length values;

(b) instruction pointer selection logic, said selection logic providing a current instruction pointer value, said instruction pointer selection logic including storage for a plurality of next instruction pointer values respectively associated with said plurality of instruction streams;

(c) an adder having

(c1) a first input, said first input being coupled to said current instruction pointer value;

(c2) a second input, said second input being coupled to said first instruction length value;

(c3) a third input, said third input being coupled to said second instruction length value;

(c4) a first sum output, said first sum output providing a first instruction pointer update equal to the addition of said current instruction pointer value and said first instruction length value, said first instruction pointer update corresponding to the execution of said first operation, said first sum output being coupled to said instruction pointer selection logic;

(c5) a second sum output, said second sum output providing a second instruction pointer update equal to the addition of said current instruction pointer value to said first and second instruction length values, said second instruction pointer update corresponding to the simultaneous execution of said first and second operations, said second sum output being coupled to said instruction pointer selection logic;

(c6) a first wrap-carry output bit, associated with said first instruction pointer update by said first instruction length value; and

(c7) a second wrap-carry output bit, associated with said second instruction pointer update by said first and said second instruction length values; and

(d) an instruction pointer storage array storing a plurality of speculative instruction pointer values corresponding to at least some of said plurality of sequential operations, said instruction pointer storage array being coupled to said instruction pointer selection logic.

5,590,352

DEPENDENCY CHECKING AND FORWARDING OF VARIABLE WIDTH OPERANDS

Gerald D. Zuraski, Jr.; Scott A. White; Murali S. Chinnakonda, and David S. Christie, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 26, 1994, Ser. No. 233,567

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **31 Claims**

24. A processor which executes operations operating on variable-sized operands, comprising:

an instruction decoder including:

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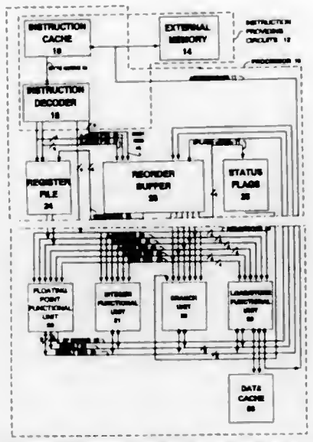


an operand field selector which defines a variable-sized operand by partitioning a full-sized operand bit-wise into a plurality of operand fields and identifying operand fields utilized by the operation, and

a dispatcher coupled to the operand field selector to dispatch operation codes, operand identifiers and utilized operand field identifiers;

a reorder buffer coupled to the instruction decoder and including:

a speculative result memory coupled to the dispatcher to receive operand identifiers and utilized field identifiers;

a reorder buffer controller responsive to the dispatching means to allocate entries in the speculative result memory;

a data dependency detector coupled to the reorder buffer controller which detects data dependencies of a utilized operand field independently of other fields, and

a tagging circuit coupled to the dependency detector and responsive to a data dependency to tag a data dependent operand field independently of other fields;

an operand bus coupled to the reorder buffer for communicating operand fields and operand field tags;

a functional unit coupled to the operand bus to receive the operand fields and the operand field tags and execute operations defined by the dispatched operation code utilizing the operand fields to generate result data; and

a result bus connected from the functional unit output to the inputs of the reorder buffer and the functional unit to forward operation result data thereto.

5,590,353

VECTOR PROCESSOR ADOPTING A MEMORY SKEWING SCHEME FOR PREVENTING DEGRADATION OF ACCESS PERFORMANCE

Tadayuki Sakakibara, Kunitachi; Teruo Tanaka, Hachioji; Yoshiko Tamaki, Kodaira, all of Japan; Katsuyoshi Kitai, Palo Alto, Calif., and Yasuhiro Inagami, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,388

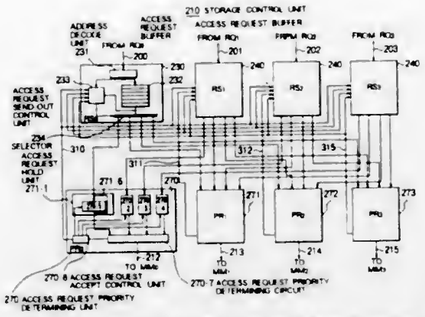
Claims priority, application Japan, Jul. 15, 1993, 5-175115

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—800 **17 Claims**

1. A vector processor, comprising:

a storage unit including a number (N) of memory modules, which number is given by a power of two and in which an interleave method of successively assigning continuous addresses to memory modules which differ from one to another is adopted;



a number (N) of access request circuits for issuing a number (N) of access requests in parallel for vector data stored in said storage unit; and

a storage control apparatus for transferring the access requests issued by said access request circuits to desired memory modules;

wherein said storage control apparatus includes access request buffer units provided in one-to-one correspondence to said access request circuits holding the access requests, respectively, and an access request priority determining circuit for arbitrating access conflict taking place upon transferring of the access requests from said plurality of access request circuit to said plurality of memory modules;

said storage control apparatus further including address decoder means for determining identification numbers of the transfer destination memory modules from addresses accompanying said access requests issued from said access request circuits, said address decoder means determining identification numbers of said memory modules which differ sequentially in accordance with a predetermined relation formula so long as said addresses vary with a predetermined skew periodicity (m), and which are shifted by a given number every time said address varies by said predetermined skew periodicity (m), said storage control apparatus further including means for making said predetermined skew periodicity (m) equal to skew periodicities of other vector processors which belong to a same system series (same machine or product series) of vector processors and which differ from one another mutually in respect to said number N.

5,590,354

MICROCONTROLLER PROVIDED WITH HARDWARE FOR SUPPORTING DEBUGGING AS BASED ON BOUNDARY SCAN STANDARD-TYPE EXTENSIONS

Peter Klapproth; Frederik Zandveld; Jacobus M. Bakker, and Gerardus C. Van Loo, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

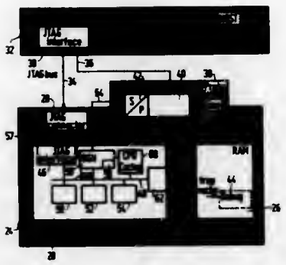
Filed Jul. 28, 1994, Ser. No. 281,964

Claims priority, application European Pat. Off., Jul. 28, 1993, 93202228

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—800 **10 Claims**

1. A microprocessor comprising a processor element, a memory interface element, an IO interface element, a debug support element and an internal bus directly connected to all above elements, said microprocessor further comprising a registered boundary scan standard (JTAG) interface element directly connected to said internal bus, said JTAG interface element accessing one or more scan chains inside said microprocessor, and said JTAG interface element furthermore controlling DMA-type exchanges via said internal bus with other elements connected to said internal bus for debugging software running on said microprocessor.



5,590,355

DATA DRIVEN PROCESSOR, A DATA DRIVEN INFORMATION PROCESSING DEVICE, AND A METHOD OF VERIFYING PATH CONNECTIONS OF A PLURALITY OF DATA DRIVEN PROCESSORS IN SUCH A DATA DRIVEN INFORMATION PROCESSING DEVICE

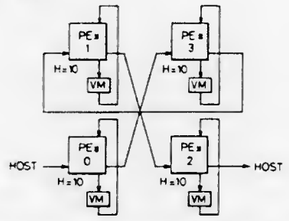
Ricardo T. Shichiku, Tenri; Shinichi Yoshida, Kashihara; Tsuyoshi Muramatsu, Tenri; Manabu Onozaki, Nara, and Yasuhiro Matsuura, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka-fu, Japan

Filed Aug. 9, 1994, Ser. No. 287,919

Claims priority, application Japan, Aug. 11, 1993, 5-199766; Mar. 25, 1994, 6-055641

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **12 Claims**



9. A data driven information processing device comprising:

a plurality of data driven processors, and

connection means for connecting said plurality of data driven processors to each other such that any two processors can be connected at least indirectly,

wherein each of said plurality of data driven processors comprises

an input port and at least two output ports,

output destination information memory means for storing output destination information specifying an output port from which a data packet is to be output in path verification testing,

disable means for selectively disabling instruction execution, by the data driven processor such that only a state of a path verification flag in the data packet is changed, of an instruction held in an instruction field of the data packet, as a function of the state of the verification flag in the data packet, regardless of the nature of the instruction held by the instruction field; and

selective output means, connected to said input port, for selectively providing an input data packet to one of said output ports according to the path verification flag and destination information included in said data packet and according to said output destination information, when instruction execution is disabled,

wherein said connection means comprises a plurality of data transmission paths for connecting said input port of said plurality of data driven processors to an output port of another of said data driven processors.

5,590,356

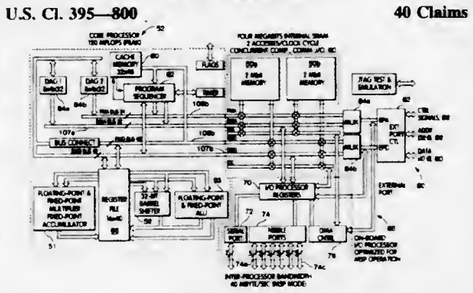
MESH PARALLEL COMPUTER ARCHITECTURE APPARATUS AND ASSOCIATED METHODS

Ira H. Gilbert, Carlisle, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 23, 1994, Ser. No. 294,757

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **40 Claims**



1. Digital data processing apparatus for synchronously processing data from a host computer, comprising:

program memory means for storing data, and bus means connecting said program memory means to the host computer;

a master processor element and an array of slave processor elements, said master processor element having means to access said data within said program memory and for broadcasting instructions to said array; and

input/output module means connected to communicate with said bus means and having a plurality of data links connected to said array, each of said data links providing serial communication with selected slave processor elements;

wherein each of said slave processor elements comprises

(i) an input/output processor section having interprocessor communication links for communicating data through link ports to and from selected other processor elements within said array, and further having means for communicating data to and from said input/output module means, the input/output processor section being programmable to through-route data by defining transfer leg specifications including link port selection and leg durations,

(ii) internal memory means having a storage capacity of at least 128 kilobytes for storing executable code and data, and

(iii) a core processor section for processing said executable code and said instructions, each of said processor sections being operable independently from the other of said processor sections;

said slave processor elements synchronously executing at least one of said instructions and said executable code.

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5,590,357

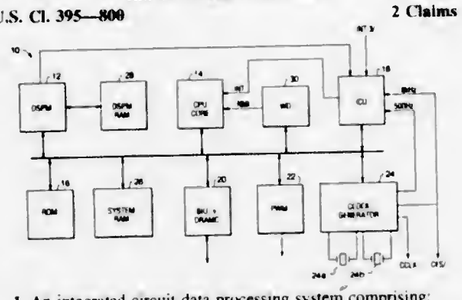
INTEGRATED CPU CORE AND PARALLEL, INDEPENDENTLY OPERATING DSP MODULE AND TIME-CRITICAL CORE PRIORITY SCHEME

Amos Intrater, Natamya, Israel; Andy Birenbaum, Lyons, France; Gideon Intrater, Tel-Aviv, Israel; Iddo Carmon, Kfar Saba, Israel; Ilan Shimony, Ramat-Gan, Israel; Itael Fraenkel, Petah Tikva, Israel; Lev Epstein, Holon, Israel; Lior Katzri, Ramat-Aviv, Israel; Omri Viner, Hod Hasharon, Israel; Raya Levitan, Givataim, Israel; Ronny Cohen, Ramat-Hasharon, Israel; Sidi Yomtov, Nex-Ziona, Israel; Yehezkel Tzadik, Hedera, Israel; Zvi Greenfeld, Kfar Saba, Israel; Israel Greiss, Raanana, Israel; Oved Oz; Yachin Afek, both of Cfar Saba, Israel; Meir Tsadik, Hod Hasharon, Israel; Moshe Doron, Givataim, Israel, and Alberto Sandbank, Natanya, Israel, assignors to National Semiconductor Corporation, Del.

Continuation of Ser. No. 63,403, May 17, 1993, abandoned, which is a division of Ser. No. 806,682, Dec. 6, 1991, abandoned. This application Sep. 6, 1994, Ser. No. 301,739

Int. Cl.[6] G06F *13/12;13/24*

U.S. Cl. 395—800 **2 Claims**



1. An integrated circuit data processing system comprising:

a shared internal bus for transferring both dam and instructions;

a shared bus interface unit connected to the shared internal bus and connectable via a shared external bus to a shared external memory array such that instructions and data stored in the shred external memory may be transferred to the shared internal bus via the shared bus interface unit;

a general purpose (GP) central processing unit (CPU) connected to the shared internal bus for retrieving GP instructions, the GP CPU including means for executing GP instructions to process data retrieved by the GP CPU from the shared internal bus;

a digital signal processor (DSP) module connected to the shared internal bus, the DSP module including means for executing DSP command-list code instructions to process an externally-provided signal received by the DSP module and to access the external system memory, execution of the DSP command-list code instructions by the DSP module being independent of and in parallel with execution of GP instructions by the GP CPU,

wherein the GP CPU includes arbitration means for arbitrating access to the shared external memory such that access to the shared external memory responsive to execution of command-list code instructions by the DSP module is at a higher priority than access to the shared external memory responsive to execution of instructions by the GP CPU;

means associated with the GP CPU for indicating that the GP CPU is performing time-critical operations; and

means associated with the DSP module and responsive to the indication that the GP CPU is performing time-critical operations, for preventing the DSP module from executing command-list code instructions which cause access to the shared external memory, whereby the DSP module is temporarily prevented from interfering with the time-critical operations being performed by the GP CPU.

5,590,358

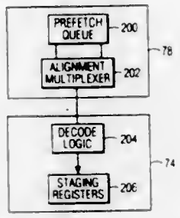
PROCESSOR WITH WORD-ALIGNED BRANCH TARGET IN A BYTE-ORIENTED INSTRUCTION SET

Ori K. Mizrahi-Shalom, San Jose, and Kung-Ling Ko, Union City, both of Calif., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Sep. 16, 1994, Ser. No. 308,337

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—800 **11 Claims**



10. A system, comprising:

a code generator performing instruction expansion and code manipulations to align transfer target addresses on word boundaries; and

a processor, comprising:

an instruction queue receiving byte aligned instructions;

an alignment multiplexer coupled to said queue and aligning the instructions for execution;

a program counter register designating addresses of instructions fetched;

an instruction address modification unit coupled to said program counter register and modifying a program counter using a word-aligned address when loading a schedule program flow change address and using a byte-aligned address otherwise;

transfer means for returning from unplanned program flow changes using byte aligned addresses; and

execution means for executing the fetched instructions.

5,590,359

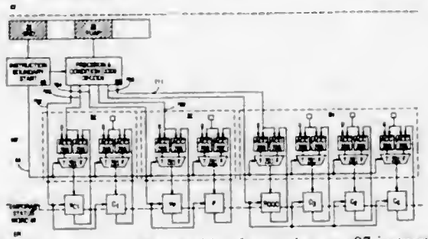
METHOD AND APPARATUS FOR GENERATING A STATUS WORD IN A PIPELINED PROCESSOR

Harshvardhan P. Sharangpani, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 925,984, Aug. 5, 1992, abandoned. This application Sep. 27, 1994, Ser. No. 313,728

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—800 **20 Claims**



8. In a microprocessor capable of executing an x87 instruction set and having a pipelined floating point unit with a plurality of stages including a first stage and a last stage, a method of generating an x87 Status Word for an instruction as it completes the last stage of the execution pipeline, said method comprising the steps of:

decoding an instruction into a stream of microvectors or into a single microvector, wherein each of said microvectors comprises a plurality of control fields, wherein a first control field provides control directives for updating a TOS component of the Status Word, a second control field provides boundary information specifying first and last microvectors of said stream of microvectors representing said instruction, wherein if said instruction is decoded into a single microvector said second control field specifies both a first and last microvector, a third control field controls an updating of a plurality of condition code bits P, C1, C0, C2 and C3 of said Status Word and a fourth control field controls the updating of a plurality of components SF, U, 0, Z, D and I of said Status Word;

providing in the last stage of the pipeline storage means SW for storing the x87 Status Word representing overall status of the floating point unit due to a plurality of executed instructions, said SW storage means having storage means for each bit of the x87 Status Word, a SW.B storage means for storing a busy bit of the Status Word, storage means SW.C3, SW. C2, SW. C1, SW.CO, for storing the condition code bits C3, C2, C1 and CO, of the Status Word, respectively, a SW.ES storage means for storing an error summary bit of the Status Word, a SW.SF storage means for storing a stack flag bit of the Status Word, a SW.P storage means for storing a status precision bit of the Status Word, a SW.U storage means for storing an underflow exception bit of the Status Word, a SW.O storage means for storing an overflow exception bit of the Status Word, a SW.Z storage means for storing a zero divide bit of the Status Word, a SW.D storage means for storing a denormalized operand bit of the Status Word, a SW.I storage means for storing an invalid operation bit of the Status Word, a SW.TOS storage means for storing a top of stack pointer of said Status Word;

providing storage means (TSW) in in a stage prior to said last stage of said pipelined floating point unit said storage means for storing and accumulating status data of said individual microvectors of said instruction, wherein when said last microvector of said instruction is in the second to last stage of the pipeline said accumulated status data representing the status of the floating point unit due to said instruction alone, said TSW storage means having storage means TSW.C3, TSW.C2, TSW.C1, TSW.CO, for storing the condition code bits C3, C2, C1 and CO, respectively, representing the status of the floating point unit due to said instruction alone, a TSW.SF storage means for storing the stack flag bit representing the status of the floating point unit due to said instruction alone, a TSW.P storage means for storing the precision bit representing the status of the floating point unit due to said instruction alone, a TSW.U storage means for storing the underflow exception bit representing the status of the floating point unit due to said instruction alone, a TSW.0 storage means for storing the overflow bit representing the status of the floating point unit due to said instruction alone, a TSW.Z storage means for storing the zero divide bit representing the status of the floating point unit due to said instruction alone, a TSW.D storage means for storing the denormalized operand bit representing the status of the floating point unit due to said instruction alone, a TSW.I storage means for storing the invalid operation bit representing the status of the floating point unit due to said instruction alone, a TSW.TOS storage means for storing the present top of stack pointer due to said instruction;

associating a valid bit VP with said TSW.P storage means, associating a valid bit VC1 with said TSW.C1 storage means and associating a valid bit Vccc with the group of TSW.C0, TSW.C2 and TSW.C3 storage means wherein said valid bits indicate when said associative storage means contains valid data;

generating with each microvector of said instruction a TOS value, wherein said TOS value is generated from said first control field of said microvector, and staging down said TOS value, along with said microvector which generated said TOS value, to said TSW.TOS storage means;

clearing said TSW.B, TSW.C3, TSW.C2, TSW.C1, TSW.C0, TSW.ES, TSW.SF, TSW.P, TSW.U, TSW.O, TSW.Z, TSW.D and TSW.I storage means each time a first microvector enters the second to last stage of the pipeline;

updating with each microvector of said instruction a prespecified group of said TSW.C0, TSW.C1, TSW.C2, TSW.C3 and TSW.P storage means and setting said associated valid bits of those storage means which have been updated, said updated group specified by said third control field of said microvector;

updating with each microvector of said instruction said TSW.SF, TSW.U, TSW.0, TSW.Z, TSW.D and TSW.I storage means according to said fourth control field of said microvectors; and

generating when said last microvector is in the last stage of the pipeline a new Status Word from said accumulated status stored in said TSW storage means and from the current Status Word presently stored in said SW storage means said new Status Word providing the overall status of the processor after execution of said instruction.

5,590,360

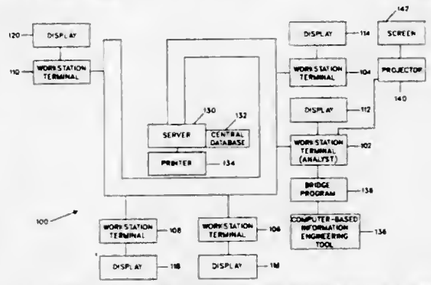
APPARATUS AND METHOD FOR GATHERING AND ENTERING DATA REQUIREMENTS FROM MULTIPLE USERS IN THE BUILDING OF PROCESS MODELS AND DATA MODELS

Geraldine E. Edwards, Redding, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 962,764, Oct. 19, 1992, abandoned. This application Dec. 20, 1994, Ser. No. 360,195

Int. Cl.[6] G06F *15/40*

U.S. Cl. 395—800 **10 Claims**



7. Apparatus for gathering Information for modelling a preselected Process or a dataflow, said apparatus comprising:

a local area network having a plurality of user terminals and an analyst terminal on the network, each terminal having a respective display and means for entering data;

computer server means, connected to the network and having a centralized database, for receiving from the terminals and storing in the database Information related to the preselected Process or dataflow;

means for displaying at least one data item on each user display to prompt each user to selectively respond with input;

means for providing the same data items to each user display for display at the same time;

means for enabling the user at each user terminal to enter natural language Information for the preselected Process or dataflow into the centralized database;

means for storing data received from the plurality of user terminals in common tables in the centralized database;

information engineering tool means for constructing decomposition models or dataflow models or Entity relationship diagrams or a combination thereof based on data files having a prescribed format;

bridge means for converting the stored data in the database into data files in the prescribed format; and

means for connecting the bridge means and information engineering tool means and for exporting the data files converted by the bridge means to the information engineering tool means;

wherein the bridge means includes:

token identifier means for assigning and storing, in files corresponding to the files recognized by the information engineering tool means, token identifiers for (i) Parent Processes and subsidiary Processes that compose each Par-

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ent Process, (ii) Data Flows, (iii) External Agents, (iv) Associations, (v) Entities associated with Data Flows, and (vi) Attributes associated with Entities;

means for selecting and associating all offspring Processes which compose a Parent Process and storing an association therebetween; and

means for assigning, to Information assigned a token by the token identifier means, type codes that are prescribed by the information engineering tool means.

5,590,361

MICROPROCESSOR HAVING AN EFFECTIVE BICMOS EXTRA MULTIPLE INPUT COMPLEX LOGIC CIRCUIT

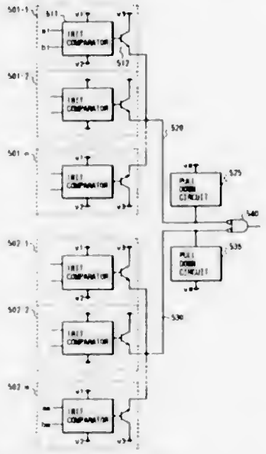
Masahiro Iwamura; Tatsumi Yamauchi; Shigeya Tanaka, all of Hitachi, and Kazutaka Mori, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 748,511, Aug. 22, 1991, abandoned. This application Dec. 23, 1994, Ser. No. 364,406

Claims priority, application Japan, Aug. 31, 1990, 2-228136

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **21 Claims**



5. A complex logic circuit comprising:

N (N≧2) number of unit logic circuits, each of said unit logic circuits including:

a CMOS logic circuit for outputting one signal in response to M (M≧1) input signals, and

a bipolar transistor, of which the collector is connected to a power source, the base is connected to an output of said CMOS circuit, and the emitter being connected to a common output line;

a connection node coupled to said common output line for connecting outputs of said unit logic circuits; and

common output line pull-down means provided between said connection node and a reference voltage for pulling down the common output line to a same level as said reference voltage when said common output line is not energized,

wherein one logic output is output in response to M×N input signals from said connection node.

5,590,362

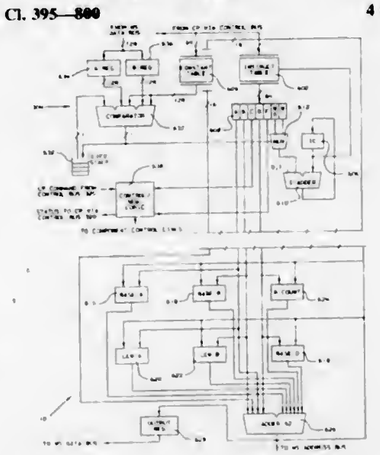
DATABASE ENGINE PREDICATE EVALUATOR

Richard I. Baum, Poughkeepsie; Glen A. Brent, Fishkill; Donald H. Gibson, Salt Point, and David B. Lindquist, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 243,729, May 17, 1994, which is a continuation of Ser. No. 993,170, Dec. 18, 1992, abandoned, which is a division of Ser. No. 499,849, Mar. 27, 1990, Pat. No. 5,082,740. This application Jan. 24, 1995, Ser. No. 378,985

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **4 Claims**



1. An apparatus for performing predicate evaluation, said apparatus comprising

instruction table means for storing a predicate evaluation program, the instruction table means comprising means for receiving the predicate evaluation program from an external processor;

instruction register means, coupled with the instruction table means, for receiving an instruction to be executed from the instruction table means, said instruction register means including a field for storing a branching condition and a field for storing a branching address;

internal processor means coupled with the instruction table means, coupled with the instruction register means, for controlling a sequence of operations within the predicate evaluation apparatus in accordance with the predicate evaluation program, said internal processor being programmable by said predicate evaluation program;

next field branching means, coupled with the instruction register means and responsive to a branch condition stored in said field for storing a branch condition, for determining when a processing operation of a predicate evaluation query causing processing of records in operations on sequential portions produces a result matching said branch condition, without processing the entire record, and for causing the internal processor means to branch to said branch address and around unnecessary instructions for processing the rest of the record in the predicate evaluation program for processing the query;

a stack for temporarily holding data during the processing of the predicate evaluation program, said data being other than said predicate evaluation program; and

comparator means, coupled with the internal processor means, for comparing a first value from the top of the stack with a second value obtained from the working storage.

5,590,363

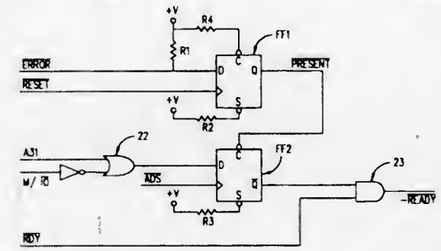
CIRCUIT FOR DETECTION OF CO-PROCESSOR UNIT PRESENCE AND FOR CORRECTION OF ITS ABSENCE

David R. Lunsford, and Michael D. Durkin, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 750,442, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 339,690, Apr. 18, 1989, abandoned. This application May 14, 1993, Ser. No. 387,658

Int. Cl.[6] C06F *15/16*

U.S. Cl. 395—800 **5 Claims**



5. A personal computer system having a local bus, a central processor unit (CPU) for producing a first signal, and an optional co-processor unit that is addressable by the CPU and that is capable of producing a second signal, the system comprising:

(a) a socket, having pins, for receiving the co-processor unit, the pins being connected to communicate with the CPU through the local bus;

(b) a presence-detect circuit receiving a signal indicative of whether the co-processor unit is mounted in the socket, and providing an output signal at a first voltage level when the co-processor unit is mounted in the socket, and at a second voltage level when the co-processor unit is not mounted in the socket; and

(c) a logic circuit capable of receiving the output signal from the presence-detect circuit, the first signal from the CPU, and the second signal from the optional co-processor unit and providing a third signal that is responsive to the second signal if the co-processor unit is installed into the socket and responsive to the first signal if the co-processor unit is not installed into the socket.

5,590,364

SIGNAL PROCESSING APPARATUS

Kohtaro Hanzawa, Iruma; Goro Sakata, Mitaka, and Kikuji Tanaka, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

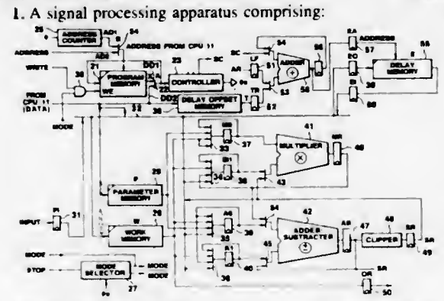
Continuation of Ser. No. 150,542, Nov. 10, 1993, which is a continuation of Ser. No. 770,646, Oct. 3, 1991, abandoned. This application Mar. 17, 1995, Ser. No. 407,498

Claims priority, application Japan, Oct. 31, 1990, 2-294569

Int. Cl.[6] G06F *9/445*

U.S. Cl. 395—800 **12 Claims**

1. A signal processing apparatus comprising:



storing means for storing contents including a first program;

processing means for processing an input signal based on the first program received from said storing means within a period of a cycle of a sync signal and for outputting a processed signal;

instructing means for generating an instruction signal for instructing rewriting of said contents stored in said storing means;

instruction signal outputting means for outputting the instruction signal generated by said instructing means, in synchronism with the sync signal which is generated immediately after the instruction signal is generated by said instruction means;

control means for preventing the first program from being sent from said storing means to said processing means, in response to the instruction signal output from said instruction signal outputting means, and for enabling the first program stored in said storing means to be rewritten; and

writing means for writing a second program onto the first program stored in said storing means, the second program being different from the first program stored in said storing means, when said control means has enabled said contents of said storing means to be rewritten, and for sending the second program to be written in said storing means to said processing means, so as to enable said processing means to process the input signal based on said second program while said second program is being written onto the first program in said storing means, such that an operation by said writing means for writing the second program onto the first program in said storing means and an operation by said processing means for processing the input signal based on the second program are performed simultaneously, wherein the input signal is continuously processed based on the first and second programs without an interruption.

5,590,365

PIPELINE INFORMATION PROCESSING CIRCUIT FOR FLOATING POINT OPERATIONS

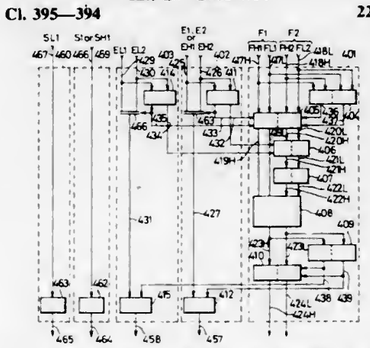
Nobuhiro Ide, Tokyo-to; Takeshi Yoshida, Kanagawa-ken; Yoshihisa Kondo, Kanagawa-ken; Masato Nagamatsu, Kanagawa-ken; Junji Mori, Kanagawa-ken, and Itaru Yamazaki, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 678,711, Apr. 1, 1991, abandoned. This application Mar. 21, 1995, Ser. No. 408,125

Claims priority, application Japan, Mar. 30, 1990, 2-084721; Jun. 7, 1990, 2-147499

Int. Cl.[6] G06F *7/38*

U.S. Cl. 395—394 **22 Claims**



7. An operation unit for floating point arithmetic operations, comprising:

first operation means which has a bit width sufficient for carrying out a first operation, and can be operated in a first operation mode for carrying out the first operation and a second operation mode for carrying out a second operation,

second operation means having a bit width sufficient at least for carrying out the second operation,

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third operation means which has a bit width sufficient for carrying out the first operation, and can be operated in the first operation mode and the second operation mode,

fourth operation means having a bit width sufficient at least for carrying out the second operation, and

fifth operation means which has a bit width sufficient for carrying out the first operation, and is operated in the first operation mode, the second operation mode and a third operation mode for carrying out two different sets of second operations are carried out at a same time.

5,590,366

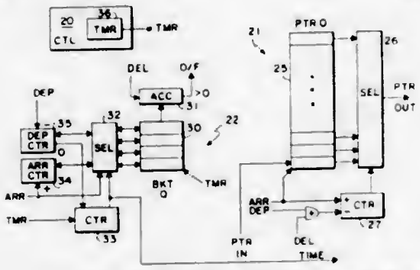
PACKET FORWARDING SYSTEM FOR MEASURING THE AGE OF DATA PACKETS FLOWING THROUGH A COMPUTER NETWORK

Stewart F. Bryant, Redhill, England; Michael J. Seaman, San Jose, Calif., and Christopher R. Szmidt, Reading, England, assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 889,551, May 27, 1992, abandoned. This application Apr. 13, 1995, Ser. No. 421,141

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **2 Claims**



1. A packet forwarding station for a computer network, comprising:

a receiving module for receiving a plurality of packets, each packet having an age held; and

an output module, said output module including:

a timing means for defining successive time intervals;

means for grouping each packet into one of a plurality of groups in dependence on said successive time interval in which each packet arrives at said station;

age measuring means, including a group counter, for maintaining an age for each of said groups, said group counter maintaining a running count of said groups;

a shift register having a plurality of stages, said stages including a top stage and a bottom stage, each stage for containing a packet count of how many of said packets were grouped into one of said groups,

wherein when said timing means defines a new time interval, a packet count contained in said top stage is shifted out of said shift register, a packet count contained in each of the other stages is shifted into an emptied stage of said shift register, and a packet count contained in said bottom stage is set to zero, said packet count contained in said bottom stage then incrementing whenever a new packet is received by said receiving module during said new time interval; and

an overflow accumulator for receiving a packet count shifted out of said top stage of said shift register;

said output module for using said group counter to alter the age field of a first packet before transmitting said first packet, and for discarding a second packet when said second packet is included in a packet count that is shifted out of said top stage.

5,590,367

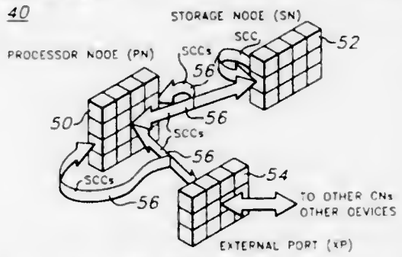
PROCESSING MODULE FOR PROGRAMMABLE PROCESSING USING COMPUTER GENERATED HOLOGRAMS

Tsen-Hwang Lin, Dallas, and Falvey Malarcher, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 275,463, Jul. 14, 1994, abandoned, which is a continuation of Ser. No. 809,595, Dec. 18, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 466,028

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—800 **4 Claims**



1. A processing module comprising:

a. at least one processing board comprising a plurality of processing elements each processing element comprising:

i. at least one signal receiver for receiving an incoming signal to said processing element;

ii. at least one signal transmitter for transmitting an outgoing signal from said processing element;

iii. at least one digital micromirror device to provide intraboard and interboard communication with other processing elements;

b. at least one computer generated hologram board which, in conjunction with said digital micromirror device, directs said outgoing signal and said incoming signal to and from other processing elements;

c. at least one extension board which, in conjunction with said digital micromirror device and said computer generated hologram board, provides interboard communication between said processing element on said processing board and other processing elements on other processing boards; and

d. at least one clear spot on said computer generated hologram board which allows said incoming signal and said outgoing signal from said processing element to reach said extension board.

5,590,368

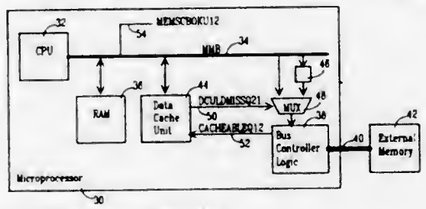
METHOD AND APPARATUS FOR DYNAMICALLY EXPANDING THE PIPELINE OF A MICROPROCESSOR

Jay Heeb, Gilbert, Ariz.; Sunil Shenoy, and Jimmy Wong, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 40,675, Mar. 31, 1993, abandoned. This application Jul. 27, 1995, Ser. No. 508,318

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **9 Claims**



3. A microprocessor, comprising:

a core unit for issuing instructions and processing data, said core unit being coupled to a local bus;

a bus controller logic for loading instructions and data from an external store to said microprocessor to be processed by said core unit, said bus controller logic being coupled to the local bus and to a system bus, the system bus for transferring data between said microprocessor and the external store;

a data cache unit for storing copies of data loaded by said bus controller logic and retrieving the copies of data for use by said core unit, said data cache unit being coupled to the local bus;

a pipeline, coupled to the local bus, for causing a first pipe to at least issue a first instruction on the local bus during a cycle and a second pipe to at least execute a second instruction during the cycle, said pipeline repeatedly executing the cycle, the first instruction issued by the first pipe in the cycle being available for execution by the second pipe in a next cycle, the first pipe causing said core unit to issue the first instruction, the second pipe selectively causing said bus controller logic or said data cache unit to execute the second instruction;

said data cache unit determining if a copy of a first external data is stored in said data cache unit when the first instruction issued by the core unit during the cycle is a load instruction to load the first external data from external to said microprocessor, the determining beginning during the cycle but not finishing before the cycle ends, the cycle being immediately followed by a second cycle, the second cycle being immediately followed by a third cycle;

said bus controller logic indicating to said data cache unit whether the first external data is cacheable, said bus controller logic being coupled to said data cache unit, said data cache unit determining if a copy of the first external data is stored only if the first external data is cacheable;

said bus controller logic delaying execution of the second instruction in the second cycle until the third cycle when the first external data is cacheable;

a scoreboarding unit for scoreboarding the first pipe when the copy of the first external data is not stored in said data cache unit and the first instruction issued by the first pipe in the second cycle is an instruction that requires execution by said bus controller logic, said scoreboarding maintaining the state of the first pipe for one additional cycle such that the first instruction issued by the first pipe in the second cycle is reissued by the first pipe in the third cycle, said scoreboarding unit being coupled to the local bus;

an instruction latch coupled to the local bus, said instruction latch latching a copy of the first instruction issued by the first pipe during the cycle; and

a mux having a first input coupled to the local bus, a second input coupled to the instruction latch, a select input coupled to said data cache unit, and a mux output coupled to said bus controller logic, said mux selecting either the first input or the second input to be driven at the mux output, said mux selecting the first input when the cow of the first external data is stored in said data cache unit, said mux selecting the second input when the copy of the first external data is not stored in said data cache unit.

5,590,369

BUS SUPPORTING A PLURALITY OF DATA TRANSFER SIZES AND PROTOCOLS

Dana J. Burgess, Estes Park, and Robert E. Stubbs, Longmont, both of Colo., assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 275,119, Jul. 14, 1994, abandoned. This application Aug. 3, 1995, Ser. No. 511,048

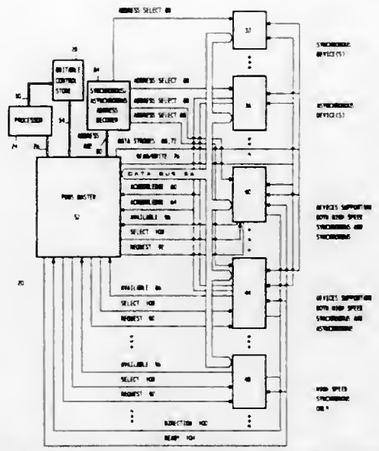
Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **17 Claims**

11. An apparatus for transferring data between components communicating with a bus, comprising:

a single master component;

a plurality of components communicating with said master component, said plurality of components including at least a first



high speed synchronous component and one of a synchronous component and an asynchronous component and wherein all data transfers from each of said plurality of components are sent to said master component;

a bus including connection means connecting said master component and said plurality of components for transferring data between said master component and said plurality of components, said connection means including a predetermined plurality of data transmission lines such that substantially every data transfer on said bus uses said plurality of data transmission lines and said connection means has a number of control lines that provide the following:

(a) a request signal supplied by said master component to said first high speed synchronous component in which said request signal has a logic state that changes to indicate that said master component has data for transfer;

(b) an available signal supplied by said first high speed synchronous component that has a logic state that changes after said logic state of said request signal changes to indicate that said first high speed synchronous component is available to commence transfer of data; and

(c) a ready signal supplied by said master component that changes its logic state after the logic state of said available signal is changed and before all data is transferred;

wherein said changes of said logic states of said request, available and ready signals occur in connection with a first high speed synchronous data transfer operation;

a plurality of protocol performing means, each protocol performing means used in a data transfer on said bus using a predetermined protocol, said plurality of protocol performing means including: a high speed synchronous protocol performing means related to a high speed synchronous protocol in which a varying amount of data can be transferred between said master component and said first high speed synchronous component during an unpredetermined period of time and at least one of: a synchronous protocol performing means related to a synchronous protocol in which data is transferred involving said master components for a predetermined time interval and an asynchronous protocol performing means related to an asynchronous protocol in which data is transferred until an acknowledged signal is received by said master component;

wherein said master component controls operations of said bus, with said master component selecting which one of said plurality of components is to be involved with a data transfer including said master component selecting said first high speed synchronous component to receive data from said master component, and wherein said first high Speed synchronous data transfer operation involves a data transfer from said master component to said first high speed synchronous component in which a first amount of data is transferred for a first

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unpredetermined period of time and said master component is also involved with a second high speed synchronous data transfer operation from said master component to said first high speed synchronous component in which a second amount of data is transferred for a second unpredetermined period of time, with said second unpredetermined period of time and said second amount of data being different from said first unpredetermined period of time and said first amount of data, respectively, with all of said data being transferred in connection with said first high speed synchronous data transfer operation after said first changing of the logic state by said ready signal and before any subsequent changing of the logic state of said ready signal, and wherein all of said request signal, said available signal and said ready signal change their logic states and in the same predetermined time sequence for said second high speed synchronous data transfer operation as was done for said first high speed synchronous data transfer operation.

5,590,370

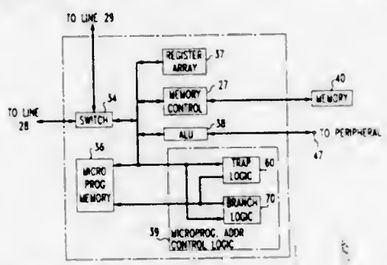
INTELLIGENT MEMORY SYSTEM FOR PROCESSING VARIBABLE LENGTH I/O INSTRUCTIONS

Abhaya Asthana; Mark R. Cravatts, both of Berkeley Heights, and Paul Krzyzanowski, Fanwood, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 231,528, Apr. 22, 1994, abandoned. This application Nov. 16, 1995, Ser. No. 558,208

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—800 **8 Claims**



7. A computer system comprising:

a host processor;

memory comprised of two or more active storage elements which are arranged in an array, each active storage element comprising a memory element and a processing element associated with the memory element, said memory element being capable of receiving and storing variable length instructions which are used to implement one or more functions, said host processor compiling and downloading said variable length instructions to said memory at run time;

at least one peripheral;

a first port for connecting said processing element to said host processor;

a second port for connecting said processing element to at least one of the peripherals, said processing element receiving data from said peripheral via a bus that is independent of the connection of the host processor to the first port; and

means for transmitting a packet to said processing element for invoking said variable length instructions, said invoked variable length instructions being capable of performing low level operations.

5,590,371

SERIAL COMMUNICATION CIRCUIT ON AN LSI CHIP AND COMMUNICATING WITH ANOTHER MICROCOMPUTER ON THE CHIP

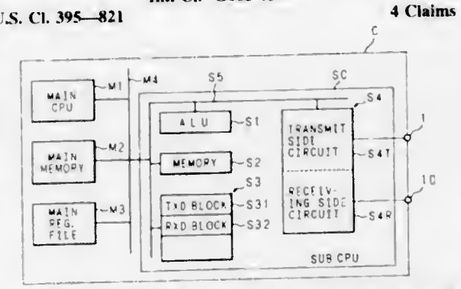
Tetsu Tashiro, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 305,937

Claims priority, application Japan, Oct. 29, 1993, 5-271954

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—821 **4 Claims**



1. A serial communication circuit for a communication protocol, which represents a predetermined meaning according to a signal of one unit composed of a plurality of sections obtained by combining high level sections and low level sections respectively having different time widths with each other and represents data of a first value or a second value by a signal of one unit having a data section in which high level or low level can be set optionally, comprising:

a control circuit;

a transmit terminal;

a receiving terminal;

a transmit data register which is given data of a plurality of bits to be transmitted from said transmit terminal and holds it therein;

a transmit pointer which designates successively bits of data held in said transmit data register;

a first register which makes said transmit pointer designate bit of said transmit data register, as well as generates a transmit trigger signal which makes data of bits designated by said transmit pointer outputted from said data register when a first value is written from said control circuit;

a second register to which a first value or a second value can be written from said control circuit, corresponding to a signal level to be transmitted from said transmit terminal;

a third register to which a first value or a second value to be transmitted from said transmit terminal can be written from said control circuit after selecting a content of said second register or said transmit data register;

a receiving data register which holds data of a plurality of bits to be received from said receiving terminal so as to make said control circuit to read it;

a receiving pointer which designates successively bits of data to be held in said receiving data register;

a fourth register which makes said receiving pointer designate bit of said receiving data register, as well as generates a receiving trigger signal which makes bit of said receiving data register designated by said receiving pointer take in a value of a signal inputted from said receiving terminal when the first value is written from said control circuit; and

a fifth register which makes said control circuit read a signal received from said receiving terminal directly;

wherein said control circuit at the time of transmitting according to a predetermined program, writes a first or a second value to said second register every time a time determined in said program is passed, writes the first value to said first register at a time corresponding to said data section so as to give said transmit trigger signal to said transmit pointer and said transmit data register as well as writes the first value or the second value to said third register, thereby transmits each signal of one unit from said transmit terminal, and at the time of receiving according to a predetermined program, reads out from said fifth register a signal received from said receiving terminal so as to recognize a meaning of each signal of one unit, writes the first value to said fourth register at a time corresponding to said data section and gives said receiving trigger signal to said receiving pointer and to said receiving data register, thereby data is taken to said receiving data register.

5,590,372

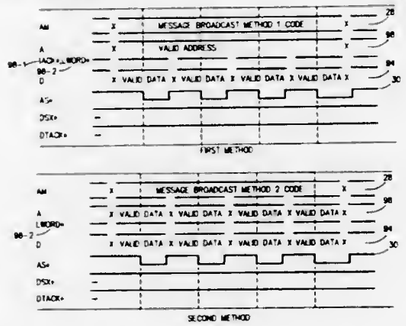
VME BUS TRANSFERRING SYSTEM BROADCASTING MODIFIERS TO MULTIPLE DEVICES AND THE MULTIPLE DEVICES SIMULTANEOUSLY RECEIVING DATA SYNCHRONOUSLY TO THE MODIFIERS WITHOUT ACKNOWLEDGING THE MODIFIERS

James N. Dieffenderfer, Endicott, N.Y., and Bruce J. Morehead, Santa Clara, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 14, 1992, Ser. No. 913,270

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—823 **16 Claims**



1. A system for digital communications comprising:

a VME bus including at least a first bus portion and a second bus portion;

a first device attached to at least the first bus portion and the second bus portion and comprising

means for requesting control of the bus,

means for sending clock pulses via said bus;

means for sending via the second bus portion an identifier for a broadcast,

means for sequentially sending data words via the first bus portion synchronously with said clock pulses without receiving an acknowledgment from any recipient from a time of said first device requesting said control until completion of said broadcast; and

second and third devices attached to said bus, each of said second and third devices comprising

means for receiving the broadcast identifier via the second bus portion, and

receiving means, responsive to the broadcast identifier, for receiving said data words via the first bus portion synchronously with said clock pulses without replying with an acknowledgment from a time of said first device requesting said control until completion of said broadcast, said second and third devices simultaneously receiving said data words.

5,590,373

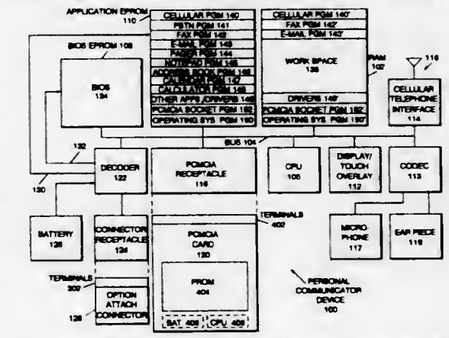
FIELD PROGRAMMING APPARATUS AND METHOD FOR UPDATING PROGRAMS IN A PERSONAL COMMUNICATIONS DEVICE

Wayne P. Whitley; Randall S. Springfield, both of Boca Raton; Harold D. Hudson, Lake Worth; Byron K. Tiller, Boca Raton; David J. Allard, Boynton Beach; Daniel Ming-Te Hsieh, Coral Springs; Julie F. Goodwin, Boca Raton; Thomas T. Murakami, Deerfield Beach, and Francis J. Canova, Jr., Boynton Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1994, Ser. No. 279,638

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—828 **14 Claims**



1. A field programing subsystem for a portable communications device that includes an electrically programmable data storage, comprising:

a decoding means coupled to a programming voltage source and the programmable data storage, for selectively applying a programming voltage to the programmable data storage;

an option connector receptacle coupled to said decoding means;

a first option attach connector, for selective connection to said option connector receptacle;

a first connector identification means included with said first option attach connector, for identifying said first option attach connector to said decoding means, and in response thereto, said decoding means causing said programming voltage to be applied to said programmable data storage;

an auxiliary device receptacle coupled to the programmable data storage;

an auxiliary memory device, including auxiliary data, for selective connection to said auxiliary device receptacle;

said first connector identification means of said first option attach connector, identifying said auxiliary memory device to said decoding means, and in response thereto, said decoding means causing said auxiliary data to be stored in said programmable data storage.

5,590,374

METHOD AND APPARATUS FOR EMPLOYING A DUMMY READ COMMAND TO AUTOMATICALLY ASSIGN A UNIQUE MEMORY ADDRESS TO AN INTERFACE CARD

Ryan E. Shariff; Gerald Moseley; Jack J. Chen, all of San Jose; Wen-Feng Chang, Saratoga, and Fazal Abbas, San Jose, all of Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 119,511, Sep. 10, 1993, abandoned. This application Jan. 30, 1996, Ser. No. 594,374

Int. Cl.[6] G06F *15/177*

U.S. Cl. 395—829 **21 Claims**

1. An interface controller for an addressable interface module, the interface module for coupling along with other addressable interface modules over a communication bus to a central processor, each interface module responding to a read command using a memory address provided by the central processor on the commu-

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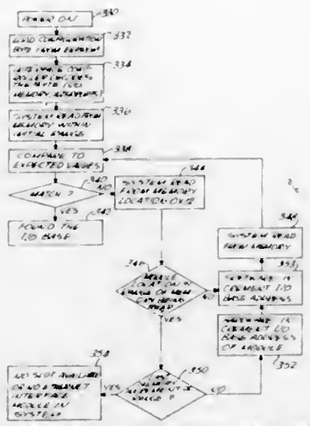


nication bus for reading configuration or other data from the interface module to the communication bus using a memory base address or to a write command using a memory address provided by the central processor on the communication bus for writing data from the communication bus to the interface module using the memory base address, the central processor being operative for comparing such configuration data read from the interface module to predetermined data for determining if the memory base address for the interface module is the same as the memory base address for one of the other interface modules and for issuing on the communication bus a dummy read command using a predetermined memory address,

the interface controller comprising:

a stored memory base address for use by the corresponding interface module in determining a unique memory base address for response by the corresponding interface module;

a decoder for decoding the stored memory base address including a modified memory base address for determining the unique memory base address for response by the corresponding interface module;

means for reading the configuration data stored at the memory address using the stored memory base address responsive to such a read command for reading the configuration data; and

means for automatic modification of the stored memory base address in the event the latter is the same as the unique memory base address for one of the other interface modules, the means for automatic modification comprising means responsive to the dummy read command using the predetermined memory address for modifying the stored memory base address to said modified memory base address.

5,590,375

APPARATUS FOR PERFORMING CONCURRENT SEEKS ON PLURAL INTEGRATED DRIVE ELECTRONICS (IDE) DISK DRIVES WITHOUT ADDITIONAL DEVICES

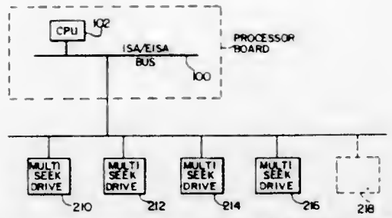
Vic Sangveraphunsiri, San Clemente; Felix Pinai, Fountain Valley; Thomas Shu, Lake Forest, and Cameron Spears, Diamond Bar, all of Calif., assignors to Advanced Logic Research, Irvine, Calif.

Continuation of Ser. No. 935,713, Aug. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 926,675, Aug. 10, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 353,336

Int. Cl.[6] G06F *7/00;13/00*

U.S. Cl. 395—841 **12 Claims**

1. A computer system, comprising:



a) a processor connected to a first bus and executing software normally allowing only a single seek operation at a time to be performed for the processor; and

b) a plurality of enhanced disk drives, each enhanced disk drive including:

1) an unenhanced disk drive having means for performing the seek operations; and

2) means for interfacing the first bus to the unenhanced disk drive and for allowing plural seek operations on respective plural unenhanced drives to be concurrently performed for the processor using the software;

wherein the plural interfacing and allowing means within respective plural enhanced drives collectively allow the plural concurrent seek operations without being controlled in common by shared selection devices outside the processor, first bus and enhanced disk drives.

5,590,376

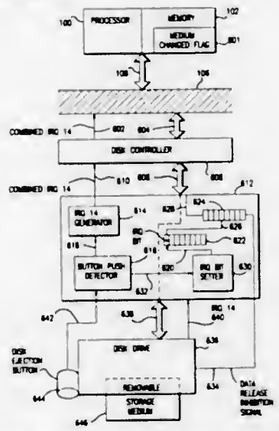
APPARATUS AND METHOD FOR DETECTING AND UPDATING STATUS OF REMOVABLE STORAGE SYSTEM USING SHARED INTERRUPT AND SOFTWARE FLAG

James L. T. Kou, Corona, Calif., assignor to Toshiba America Information Systems, Inc., Irvine, Calif.

Filed Nov. 13, 1992, Ser. No. 974,742

Int. Cl.[6] G06F *13/00;13/10;13/36*

U.S. Cl. 395—839 **17 Claims**



17. A system for detecting the removal of a first removable storage medium from a removable medium receptacle and for permitting media operations to be performed on a second removable storage medium substituted for the first removable storage medium, comprising:

signal generation means for generating a first signal upon detection of the removal of the first removable storage medium;

shared signal generation means for detecting said first signal and, in response to said detected first signal, generating a second signal representing a pre-existing signal condition,

wherein said second signal is shared between indicating that the first removable storage medium has been removed and indicating the occurrence of a pre-defined event,

determination means for receiving said second signal, and for determining whether said second signal was generated by said shared signal means or by the occurrence of said pre-defined event;

flag means for setting a flag in response to a determination by said determination means that said second signal was generated by said shared signal means, whereupon a set flag is created indicating that the first removable storage medium has been removed,

wherein said flag was set prior to performance of the media operations.

5,590,377

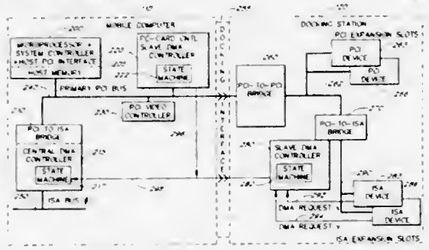
AUTOMATIC CONTROL OF DISTRIBUTED DMAS IN A PCI BUS SYSTEM SUPPORTING DUAL ISA BUSES

Michael G. Smith, Tustin, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jun. 7, 1995, Ser. No. 481,121

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—842 **7 Claims**



7. A computer system for automatically controlling direct memory accesses (DMAs) comprising:

a notebook computer comprising:

a microprocessor;

a memory under the control of said microprocessor;

a system bus;

a central DMA controller in communication with said memory via said system bus, said central DMA controller storing configuration information which provides for control of direct accesses to said memory for selected devices in communication with said system bus; and

a peripheral unit which accesses said memory via said central DMA controller;

and

a docking station which communicates with said notebook computer via a connector, said docking station comprising:

a slave DMA controller in communication with said system bus via said connector, said slave DMA controller also in communication with said central DMA controller via a hardware connection, and wherein said hardware connection provides data to said central DMA controller which designates selected portions of said configuration information which is to be transferred to said slave DMA controller; and

a peripheral unit in communication with said memory via said slave DMA controller and said system bus.

5,590,378

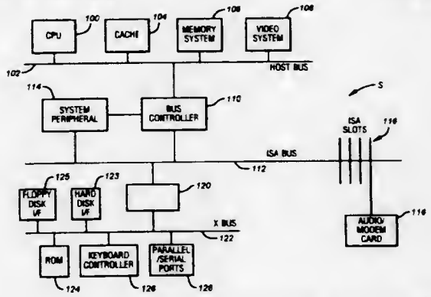
APPARATUS FOR ALIGNING AND PADDING DATA ON TRANSFERS BETWEEN DEVICES OF DIFFERENT DATA WIDTHS AND ORGANIZATIONS

John S. Thayer, and Patrick L. Ferguson, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 233,034, Apr. 25, 1994, abandoned. This application Feb. 1, 1996, Ser. No. 593,176

Int. Cl.[6] G06F *12/00;13/00*

U.S. Cl. 395—850 **12 Claims**



1. A data transfer device for bidirectionally transferring data between first and second data storing devices having different basic data widths and wherein the second data storage device includes a plurality of modes having different numbers of significant data bits contained in the basic data width and wherein significant data is stored in the first data storage device in a packed manner, the data transfer device comprising:

first data receiving circuitry for receiving data from the first data storage device at the basic data width of the first data storage device;

first data providing circuitry for providing data to the first data storage device at the basic data width of the first data storage device;

second data receiving circuitry for receiving data from the second data storage device at the basic data width of the second data storage device;

second data providing circuitry for providing data to the second data storage device at the basic data width of the second data storage device;

control register circuitry for receiving the mode indicating the amount of significant data in the second data storage device basic data width;

multiplexor circuitry for converting data received from the first data storage device to the proper mode for the second data storage device and for inserting zero values in the remaining portions of the second data storage device basic data width for provision to the second data storage device; and

multiplexor circuitry for converting data received from the second data storage device to the proper location for said first data storage device according to the mode for the second data storage device for provision to the first data storage device.

5,590,379

METHOD AND APPARATUS FOR CACHE MEMORY ACCESS WITH SEPARATE FETCH AND STORE QUEUES

Joseph A. Hassler; Gregory K. Deal, both of West Chester; Timothy A. Koss, Pottstown, and Stephen F. Heil, West Chester, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 13,254, Feb. 3, 1993, Pat. No. 5,450,564, which is a continuation of Ser. No. 518,911, May 4, 1990, abandoned. This application Mar. 14, 1994, Ser. No. 212,129

Int. Cl.[6] G06F *13/18;5/06;13/364*

U.S. Cl. 395—851 **3 Claims**

1. In a computer system having a main memory and a central processing unit (CPU) including an N-way set associative cache memory system with each data set including M data values and

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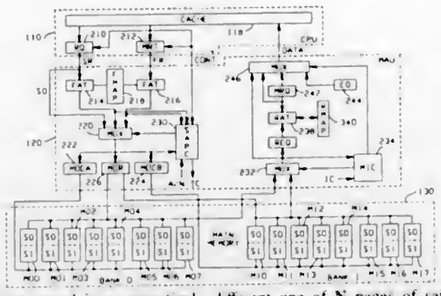


being stored in a respectively different one of N pages of said cache memory, where M and N are integers, said cache memory system including a list of data sets reserved for pending operations, a method of selecting which data set of an associated plurality of N data sets, constituting a group of candidates for replacement, is to be replaced by a set of data to be retrieved from the main memory, said method comprising the steps of:

determining if any of the N page entries for the N data sets in the associated group of data sets is marked for a deferred replace operation;

if a selected one of the N pages entries is found to be marked as being subject to a deferred replace operation, removing the data set scored in the selected page from the group of candidates for replacement;

comparing the page entries to the list of reserved data sets to determine if the page entries for all of the candidates for replacement are reserved for pending operations;

if one of the page entries for the candidates for replacement is not reserved for pending operations, selecting for replacement said candidate for replacement which is not reserved; and,

if all of the page entries for the candidates for replacement are reserved for pending operations, selecting one of said candidates for replacement depending on whether each of said pending operations is a store operation or a fetch operation, and marking the page entry corresponding to the selected candidate data set as being subject to a deferred replace operation.

5,590,380

MULTIPROCESSOR SYSTEM WITH PROCESSOR ARBITRATION AND PRIORITY LEVEL SETTING BY THE SELECTED PROCESSOR

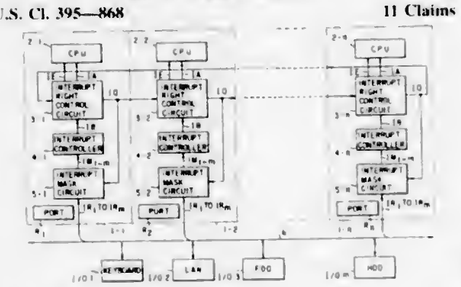
Kunio Yamada, Tokyo, and Michio Sawada, Yachiyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 50,774, Apr. 22, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 386,332

Claims priority, application Japan, Apr. 22, 1992, 4-103083

Int. Cl.[6] G06F *13/26;13/37*

U.S. Cl. 395—868 **11 Claims**



1. A multiprocessor comprising:

a plurality of processor modules;

a plurality of input/output interfaces, each for issuing an interrupt request; and

bus means for connecting each of said processor modules to each of said input/output interfaces, and for transferring said interrupt requests to each of said processor modules;

each said processor module including:

an interrupt mask circuit for outputting, in response to reception of one of said interrupt requests by said processor module, a first interrupt signal when temporary mask information of said interrupt mask circuit indicates unmasking of said received interrupt request;

an interrupt controller for outputting, in response to said first interrupt signal, a second interrupt signal when said interrupt request satisfies a predetermined condition that is based on a priority level of said interrupt controller;

an interrupt right control circuit, connected to a succeeding one of said plurality of processor modules, for transferring an interrupt right to said interrupt right control circuit of said succeeding one of said plurality of processor modules at predetermined intervals, for setting said temporary mask information of said interrupt mask circuit to indicate unmasking of said received interrupt request, and when said interrupt right control circuit has said interrupt right, for outputting a third interrupt signal and suspending transferring of said interrupt right, in response to said second interrupt signal; and

a processor having a cache memory, wherein said processor is connected to said interrupt mask circuits of said plurality of processor modules, said interrupt controllers of said plurality of processor modules and said interrupt right control circuit, and wherein said processor:

sets said priority level of said interrupt controller of each of said plurality of processor modules,

sets, in response to said third interrupt signal, said temporary mask information of said interrupt mask circuit of all other processor modules to indicate masking of said received interrupt request,

processes the interrupt request using data stored in said cache memory after said temporary mask information of said interrupt mask circuit of all other processor modules is set by said processor, and

causes, after said processor processes said interrupt request, said interrupt right control circuit to resume transferring said interrupt right to said interrupt right control circuit of said succeeding one of said plurality of processor modules.

5,590,381

METHOD AND APPARATUS FOR BUFFERED VIDEO PLAYBACK OF VIDEO CONTENT DISTRIBUTED ON A PLURALITY OF DISKS

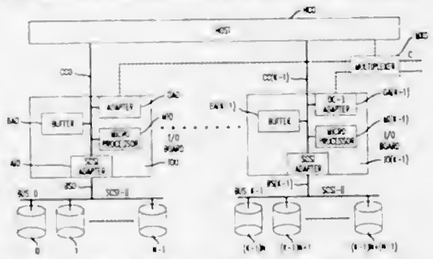
Antoine N. Mourad, Aberdeen, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 30, 1994, Ser. No. 268,599

Int. Cl.[6] G06F *13/00;11/00;12/00*

U.S. Cl. 395—872 **18 Claims**

1. A method of video playback of video content distributed on a



plurality of disks in a plurality of data blocks for a plurality of viewers, said method comprising:

within a time cycle, accessing data for each viewer from different ones of the blocks on the disks;

placing the accessed data from each block in respective buffers; and

reading out the data in the buffers sequentially;

the step of accessing including accessing the video data for each viewer from successive blocks within a video stream distributed over different disks; and

the step of placing the accessed data including placing only a single block of a video data stream in each buffer so that each viewer obtains data from a single buffer in a video data stream at any one time.

5,590,382

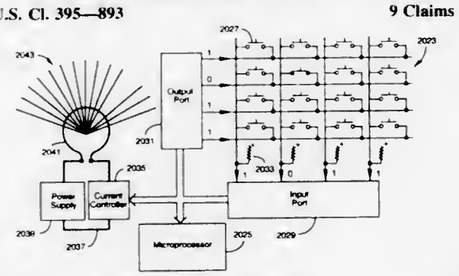
PERSONAL DIGITAL ASSISTANT MODULE HAVING A MULTI-PORTION KEYBOARD WITH INDUCTIVE COUPLING

Dan Kiklnis, Saratoga; Pascal Dornier, Sunnyvale, and William J. Seiler, Scotts Valley, all of Calif., assignors to Elonex IP Holdings Ltd., London, England

Continuation-in-part of Ser. No. 144,231, Oct. 28, 1993, and Ser. No. 31,805, Mar. 15, 1993, Pat. No. 5,365,230. This application Sep. 20, 1994, Ser. No. 286,126

Int. Cl.[6] G06F *13/00;19/00;* **H03M** *11/00*

U.S. Cl. 395—893 **9 Claims**



1. A digital assistant system comprising:

an enclosure;

a CPU within the enclosure;

a memory coupled to the CPU;

a video display coupled to and operable by the CPU, implemented on a surface of the enclosure; and

a keyboard separate from the enclosure;

wherein the keyboard comprises:

a first keyboard portion having a first group of keys electrically connected to a first portion of an electrical connector;

a second keyboard portion having a second group of keys electrically connected to a second portion of the electrical connector;

a controller electrically connected for monitoring keystrokes and managing operations of the keyboard;

a magnetic field generator in the second keyboard portion connected to the controller for generating a variable magnetic field; and

a power supply in the second keyboard portion connected for supplying electrical power to power-using elements of the keyboard;

wherein the first and second keyboard portions joined by the electrical connector form a contiguous keyboard, and wherein the power supply, controller, keys, and magnetic field generator are electrically interconnected with the controller, and the controller is adapted to drive the magnetic field generator to code keystrokes as variations in the variable magnetic field generated by the magnetic field generator.

5,590,383

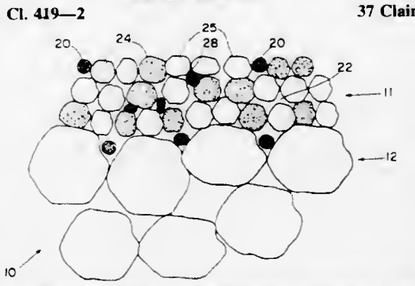
POROUS MEMBRANES AND METHODS FOR MAKING

Jainagesh A. Sekhar; James J. Liu, and Naiping Zhu, all of Cincinnati, Ohio, assignors to Micropyretics Heaters International, Inc., Cincinnati, Ohio

Division of Ser. No. 30,586, Mar. 12, 1993, abandoned. This application Aug. 29, 1994, Ser. No. 297,023

Int. Cl.[6] B22F *3/11*

U.S. Cl. 419—2 **37 Claims**



1. A method of making a porous membrane comprising the steps of:

preparing a slurry comprising at least one micropyretic substance and at least one liquid carrier for said at least one micropyretic substance;

depositing said slurry on a substrate or article;

drying said slurry into a green form having a desired geometric configuration; and

combusting said green form to produce a porous membrane having greater than 20% porosity, said porous membrane being removable from the substrate or article and useable independent thereof.

5,590,384

PROCESS FOR IMPROVING THE CORROSION RESISTANCE OF STAINLESS STEEL POWDER COMPOSITION

John H. Reinshagen, North Huntindton, Pa., assignor to Ametek, Specialty Metal Products Division, Eighty Four, Pa.

Division of Ser. No. 413,126, Mar. 28, 1995, Pat. No. 5,529,604. This application Nov. 30, 1995, Ser. No. 565,590

Int. Cl.[6] B22F *1/00;7/00*

U.S. Cl. 419—6 **11 Claims**

1. A process for improving the corrosion resistance and processability of stainless steel powder compositions which comprises providing a stainless steel powder, prealloying said stainless steel powder with about 1% to about 3% by weight of tin, blending the stainless steel powder before molding with from about 0.5% to about 1.5% of an additive in particulate form consisting essentially of by weight 2 to 30% of tin and the balance consisting essentially of at least one element selected from copper and nickel.

5,590,385

MANUFACTURING METHOD OF TARGET FOR SPUTTERING

Choong-ryul Paik, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 7, 1995, Ser. No. 487,169

Claims priority, application Rep. of Korea, Jun. 10, 1994, 94-13124

Int. Cl.[6] B22F *1/00*

U.S. Cl. 419—10 **9 Claims**

1. A manufacturing method of a target for sputtering comprising the steps of:

compressing first and second oxide powders with high permeability to form first and second compressed materials, respectively;

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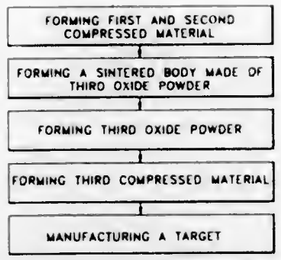


sintering said first and said second compressed materials to form a sintered body made of third oxide crystal;

pulverizing said sintered body made of said third oxide crystal to form a third oxide powder;

mixing said third oxide powder and titanium powder and compressing the mixed powder to form a third compressed material; and

sintering said third compressed material in a vacuum condition to form an oxide target.

5,590,386

METHOD OF MAKING AN ALLOY OF TUNGSTEN AND LANTHANA

Thomas J. Patrician, Monroeton, and Harry D. Martin, III, Troy, both of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Jul. 26, 1995, Ser. No. 507,183

Int. Cl.[6] C22C *1/10*

U.S. Cl. 419—20 **8 Claims**

1. A method of making an alloy of tungsten and lanthana comprising the steps of:

heating lanthanum oxide in a water saturated atmosphere until at least 95% of the lanthanum oxide is convened to lanthanum hydroxide;

forming a mixture of a tungsten metal powder and the lanthanum hydroxide powder, pressing the mixture to form a pressed ingot, and sintering the ingot at a temperature sufficient to form the alloy of tungsten and lanthana.

5,590,387

METHOD FOR PRODUCING METAL AND CERAMIC SINTERED BODIES AND COATINGS

Helmut Schmidt, Saarbrücken; Rüdiger Nass, Riegelsberg; Mesut Aslan, Pirmasens; Sener Alhayrak; Ertugrul Arpac, both of Saarbrücken; Theo König, Laufenburg-Rotzel, and Dietmar Fister, Murg, all of Germany, assignors to H. C. Starck, GmbH & Co, KG, Goslar, Germany

Filed Oct. 11, 1994, Ser. No. 321,416

Claims priority, application Germany, Oct. 27, 1993, 43 36 694.5

Int. Cl.[6] B22F *7/02*

U.S. Cl. 419—36 **35 Claims**

1. Method for producing metal and ceramic sintered bodies or coatings comprising:

(a) nanoscale ceramic or metal powder particles wherein less than 1% of the individual particles have a deviation of more than 40%, and essentially no individual particles have a deviation of more than 60%, from the average grain size, and

(b) at least one low molecular-weight organic compound having at least one functional group that reacts and/or interacts with groups present on the surface of the powder particles, the materials (a) and (b) being dispersed in water and/or a polar organic solvent as dispersion medium:

the method comprising the further steps of removing the dispersion medium, forming the surface-modified ceramic or metal powder, before or after the removal of the dispersion medium, to a green body or coating and sintering such green body or coating.

5,590,388

MOLDED CERAMIC ARTICLES AND PRODUCTION METHOD THEREOF

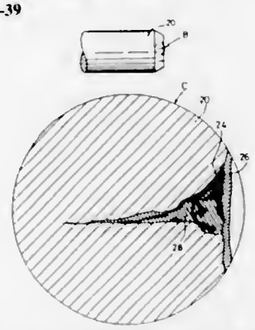
Mitsuo Kuwabara; Kiyoshi Ikegami; Teruaki Yoshida; Koji Takahashi; Tamotsu Harada; Takeshi Komiyama; Fumio Hirai, and Masamichi Hayashi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 76,500, Jun. 9, 1993, Pat. No. 5,374,391, which is a division of Ser. No. 965,085, Oct. 22, 1992, Pat. No. 5,443,615, which is a continuation of Ser. No. 652,884, Feb. 8, 1991, abandoned. This application Sep. 1, 1994, Ser. No. 299,306

Claims priority, application Japan, Feb. 13, 1990, 2-33023; Feb. 22, 1990, 2-41976; Mar. 22, 1990, 2-72854; Mar. 26, 1990, 2-76131

Int. Cl.[6] B22F *3/12*

U.S. Cl. 419—39 **10 Claims**



1. A method of producing a molded article, which comprises:

providing a powder mix as raw materials comprising electrolytic copper powder as a main component, and chromium powder within a composition range of from at least 0.4 wt. % to at most 3.0 wt. % based on the whole weight of the powder mix and a carbonaceous material in which the carbon residue falls within a composition range of at most 0.1 wt. %, or chromium powder in a proportion of from at least 4 mg to at most 30 mg per gram of the powder mix and a carbonaceous material in which the carbon residue is in a proportion of at most 1 mg per gram of the powder mix to diffuse the chromium powder into the electrolytic copper powder;

the first step wet-mixing the powder mix with a liquid additive thereby obtaining a mixed raw material;

the second step press-molding the mixed raw material obtained in the first step in a hydrostatically applied condition of pressure, thereby removing an excess of the liquid additive to obtain a preform; and

the third step subjecting the preform obtained in the second step to a heat treatment within a temperature range of at most 700° C. under an inert gas atmosphere and then sintering the preform in a temperature range of from at least 950° C. to at most 1065° C. under an inert gas atmosphere whose pressure is lower than 10 kg/cm^2, thereby depositing a reinforcement on a part of the surface of the chromium powder.

5,590,389

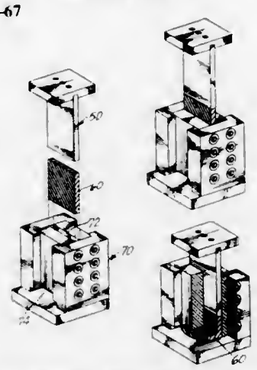
SPUTTERING TARGET WITH ULTRA-FINE, ORIENTED GRAINS AND METHOD OF MAKING SAME

John A. Dunlop, Veradale, Wash.; Jun Yuan, Santa Clara, Calif.; Janine K. Kardokus, Otis Orchards, Wash., and Roger A. Emigh, Post Falls, Id., assignors to Johnson Matthey Electronics,Inc., Spokane, Wash.

Filed Dec. 23, 1994, Ser. No. 363,397

Int. Cl.[6] B22F *3/20*

U.S. Cl. 419—67 **18 Claims**



1. A method of making a sputtering target comprising:

extruding a metal workpiece comprising a metal from the group consisting of aluminum, copper, and titanium, alone or alloyed with a dissimilar metal selected from the group consisting of copper, silicon, zirconium, titanium, tungsten, platinum, gold, niobium, rhenium, scandium, cobalt, molybdenum, hafnium, and alloys thereof, through a die having contiguous, transverse inlet and outlet channels of substantially identical cross section, whereby the workpiece enters the inlet channel and exits the outlet channel, to produce an extrusion in which the grains of the major constituent measure less than about 20 microns for an aluminum body, less than 30 microns for a copper body, and less than 10 microns for a titanium body; and

fabricating the extrusion into a sputtering target.

5,590,390

FLUID TREATMENT SYSTEM AND PROCESS

Jan M. Maarschalkerweerd, Mount Brydges, Canada, assignor to Trojan Technologies Inc., London, Canada

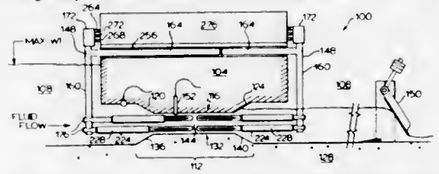
PCT No. PCT/CA94/00125, § 371 Date Oct. 17, 1994, § 102(e) Date Oct. 17, 1994, PCT Pub. No. WO94/20208, PCT Pub. Date Sep. 15, 1994

Continuation-in-part of Ser. No. 26,572, Mar. 5, 1993, Pat. No. 5,418,370. This PCT application Mar. 4, 1994, Ser. No. 318,858

Int. Cl.[6] B01J *19/12*

U.S. Cl. 422—186.3 **46 Claims**

1. A gravity fed fluid treatment system comprising a fluid inlet, a



fluid outlet, an irradiation zone disposed between the fluid inlet and fluid outlet, and at least one radiation source assembly comprising at least one radiation source and a support therefor, the at least one radiation source being elongate and having a longitudinal axis substantially parallel to the direction of fluid flow through the irradiation zone and being fully submersed in fluid flow through the irradiation zone, the support being disposed upstream or downstream of the irradiation zone, the irradiation zone having a closed cross-section to confine fluid to be treated within a predefined maximum distance from the at least one radiation source, said closed cross-section being less than a cross-section of said fluid inlet.

5,590,391

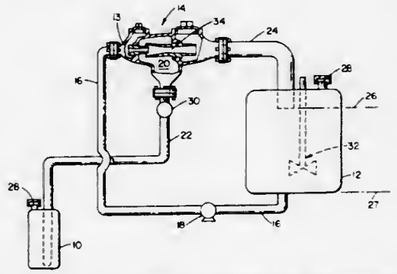
DOWN-BLENDING OF FISSIONABLE MATERIAL

Norman E. Brandon, Erwin; David R. Hopson, Jonesborough, both of Tenn.; Ronald J. Green, Hamilton, Ohio; James H. G. Grimaud, III; Timothy J. Heagle, both of Johnson City, Tenn., and Kerry D. Schutt, Gray, Tenn., assignors to Nuclear Fuel Services, Inc., Erwin, Tenn.

Filed Jan. 20, 1995, Ser. No. 375,631

Int. Cl.[6] C01G *43/00*

U.S. Cl. 423—253 **6 Claims**



1. A process for reducing the concentration of fissionable uranium containing components of a feed material to a target concentration level, comprising providing said feed material in first vessel means as an aqueous system of high-enriched uranyl nitrate hydrate (HE-UNH) wherein at least about 18% of the uranium therein is the ^{235}U isotope, providing in second vessel means an aqueous dilution medium containing natural uranyl nitrate hydrate (NUNH) wherein at least about 90% of the uranium therein is the ^{238}U isotope, forcing a diluent stream of said dilution medium from said second vessel means through jet pump means to provide a suction region within said jet pump means coextensive with said diluent stream, providing a feed fluid connection of said HE-UNH within said first vessel means with said suction region through first conduit means to cause a HE-UNH stream to flow into said suction region and intermix therein with said diluent stream to form a product stream of markedly reduced ^{235}U concentration, and providing a product fluid connection of said product stream with said second vessel means, said forcing, when carried out in an uninterrupted, recycle manner, can continually withdraw said HE-UNH from said first vessel means, mix it with NUNH in said pump means, and exit said product stream from said jet pump means and into said second vessel means until all of said HE-UNH has been diluted.

5,590,392

CORROSION-RESISTANT MATERIAL FOR CONTACT WITH HIGH TEMPERATURE MOLTEN METAL AND METHOD FOR PRODUCTION THEREOF

Yutaka Ishiwata, Zushi, and Yoshiyasu Itoh, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Feb. 22, 1995, Ser. No. 393,309

Claims priority, application Japan, Feb. 24, 1994, 6-026769

Int. Cl.[6] B22F *1/00*

U.S. Cl. 428—546 **9 Claims**

1. A corrosion resistant material comprising:

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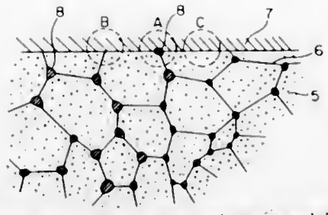


a refractory metal matrix having grains separated by grain boundaries; and

molten metal wetting prevention means for preventing the infiltration of a molten, preselected metal into the grain boundaries by presenting a non-wetting surface to the molten metal;

the molten metal wetting prevention means being oxides of metal elements selected from the group consisting of the preselected metal and metals having lower free energies for the formation of the oxide than the preselected metal.

5,590,393

NEUTRON-ABSORBING MATERIAL AND ITS PRODUCTION PROCESS

Guy M. Decroix, Chevilly-Larue; Dominique Gosset, Bourg-la-Reine, and Bernard Kryger, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

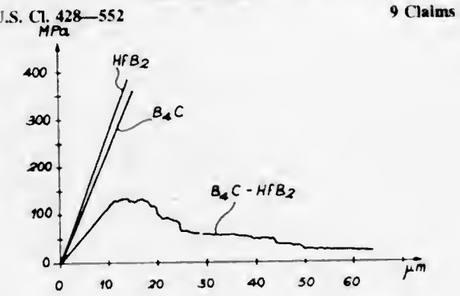
PCT No. PCT/FR94/00614, § 371 Date Feb. 7, 1995, § 102(e) Date Feb. 7, 1995, PCT Pub. No. WO94/28556, PCT Pub. Date Dec. 8, 1994

PCT Filed May 25, 1994, Ser. No. 373,262

Claims priority, application France, May 26, 1993, 93 06304

Int. Cl.[6] B22F *3/12*

U.S. Cl. 428—552 **9 Claims**



1. A composite, neutron-absorbing material comprising a homogeneous, boron carbide matrix, in which are homogeneously dispersed calibrated clusters of at least one boride chosen from among HfB_2, TiB_2 and ZrB_2, wherein the calibrated clusters have dimensions of 100 to 500 μm.

5,590,394

DATA TRANSMISSION SYSTEM FOR CATV SYSTEMS WITH CAPABILITY TO INTERRUPT THE REPEATED TRANSMISSION OF CHARACTER INFORMATION BLOCKS TO SEND PRIORITY UPDATES

Masaaki Ishimoto, and Takehito Toyota, both of Kanagawa-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

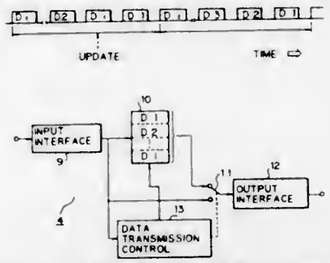
Continuation of Ser. No. 70,015, Jun. 1, 1993, abandoned, which is a continuation of Ser. No. 610,401, Nov. 7, 1990, abandoned. This application Apr. 3, 1995, Ser. No. 417,432

Claims priority, application Japan, Nov. 15, 1989, 1-296673

Int. Cl.[6] H04N *7/10;7/087*

U.S. Cl. 455—6.1 **19 Claims**

1. A data transmission system for a cable access television



(CATV) system, said data transmission system comprising:

a buffer, having an input to receive character information blocks and an output that provides a plurality of character information blocks in a predetermined order, that stores the plurality of character information blocks in the predetermined order;

a transmitter, coupled to the buffer, that transmits character information blocks over CATV transmission lines; and

a control means for controlling the buffer and the transmitter so that the transmitter transmits the character information blocks, stored in the buffer, in the predetermined order, and upon detection of an updated transmission block, for interrupting the transmission of the character information blocks in the predetermined order to send the updated character information block with priority.

5,590,395

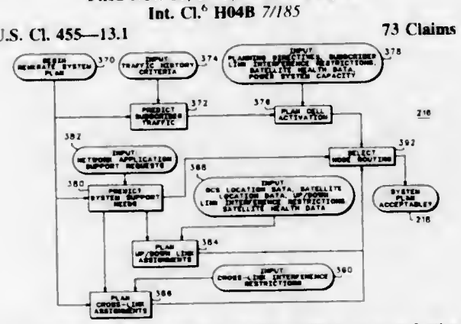
SATELLITE CELLULAR NETWORK RESOURCE MANAGEMENT METHOD AND APPARATUS

Dennis P. Diekelman, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 10, 1993, Ser. No. 150,702

Int. Cl.[6] H04B *7/185*

U.S. Cl. 455—13.1 **73 Claims**



1. A method for operating a satellite cellular communication system having multiple satellites, at least some of which are moving with respect to a surface of a celestial body, each of the satellites containing communication resources including transmitters and receivers communicating with multiple ground terminals and at least one controlling station, comprising:

a) forecasting by a first computer, communication traffic expected to pass between the ground terminals and the satellites and operating capabilities of the satellites, during a future predetermined period;

b) determining from the communication traffic and the operating capabilities, an individual operational plan for each of the satellites for managing resources on the satellites to accommodate the forecasted communication traffic during the future predetermined period;

c) transmitting to and storing within each of the satellites the individual operational plan for each of the satellites; and

d) energizing the transmitters and the receivers of each of the satellites according to the individual operational plan stored within each of the satellites in response to actual communication traffic demands during the future predetermined period.

5,590,396

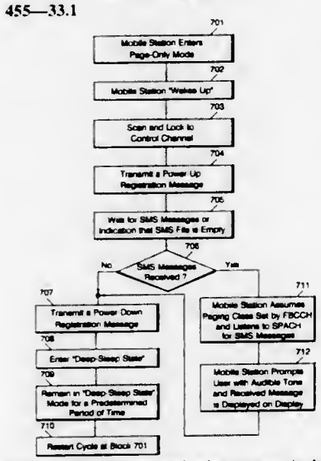
METHOD AND APPARATUS FOR A DEEP-SLEEP MODE IN A DIGITAL CELLULAR COMMUNICATION SYSTEM

Raymond C. Henry, Durham, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Apr. 20, 1994, Ser. No. 231,000

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 455—33.1 **7 Claims**



1. In a cellular radio communication system including a base station with a base station control signal, said control signal having a plurality of paging classes numbered 1 through N, said paging classes corresponding to lengths of time between paging time slots during which paging information is broadcast, and at least one mobile station conditioned to receive paging information broadcast by the base station during said paging time slots corresponding to a particular paging class assigned to the mobile station by the base station, said mobile station further having a regular sleep mode wherein a first set of selected circuits are deactivated and a deep sleep mode wherein a second set of selected circuits are deactivated, a method for saving battery power in the mobile station, comprising the steps of:

(a) placing the mobile station into a page only mode;

(b) transmitting a first signal from the mobile station to the base station indicating that the mobile station is unable to receive messages from the base station;

(c) entering said deep-sleep mode by deactivating said first set and said second set of selected circuits within the mobile station for a predetermined period of time;

(d) automatically entering said regular sleep mode by reactivating said second set of selected circuits within the mobile station after said predetermined time period;

(e) reactivating said first set of selected circuits and receiving by the mobile station the base station control signal and transmitting from the mobile station a second signal indicating that the mobile station is able to receive said messages;

(f) transmitting from the base station said messages on a set of said plurality of time slots of the base station control signal;

(g) monitoring by the mobile station said messages on said set of said plurality of time slots of the base station control signal; and

(h) repeating steps (b) through (g) until said mobile station is reset from said page only mode.

5,590,397

SELECTING AND PRIORITIZING RADIO TELEPHONE SYSTEMS AT RADIO TERMINAL

Susumu Kojima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,107

Claims priority, application Japan, Dec. 17, 1993, 5-317585

Int. Cl.[6] H04Q *7/00*

U.S. Cl. 455—33.1 **3 Claims**

SYSTEM NUMBER	SYSTEM IDENTIFICATION CODE	SELECTION INFORMATION	PRIORITY	SYSTEM NAME
1	102345	1	1	[illegible]
2	106789	1	2	HEAD OFFICE
3	110789	0	4	BRANCH OFFICE
4	500010	1	3	TOKYO
5	500029	0	5	OSAKA

1. A radio telephone system, comprising:

a radio terminal, and

a plurality of radio systems, each of which transmits a respective system identification code, particular radio systems of said plurality of radio systems providing service for said radio terminal, each said respective system identification code of said particular radio systems being stored in said radio terminal and defining a set of registered system identification codes, each of said registered system identification codes having stored in said radio terminal a corresponding user selectable selection priority and a corresponding user selectable selection information, said selection information indicating radio system enablement or non-enablement;

wherein when said radio terminal receives different ones of said registered system identification codes, said radio terminal selects a selected radio system of said particular radio systems which has said respective system identification code corresponding to one of said registered system identification codes which has a highest said selection priority, and which has said selection information indicating enablement.

5,590,398

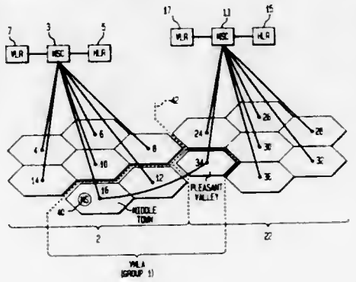
VIRTUAL MOBILE LOCATION AREA

Adrian S. Matthews, Middlesex, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 191,565, Feb. 3, 1994, abandoned. This application Mar. 27, 1995, Ser. No. 410,420

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 455—33.1 **5 Claims**



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1. In a cellular telephone network comprising a plurality of local areas, each local area comprising a plurality of base stations and having associated therewith a home location register to indicate which mobile stations in the network are registered in that particular local area, a method for locating mobile stations comprising:

determining the call habits of a mobile station;

determining the base stations that the habits of the mobile station indicate the mobile station will most likely use to initiate and receive calls;

arranging the cells that contain the base stations that the habits of the mobile station indicate the mobile station will most likely use to initiate and receive calls into a group, called a Virtual Mobile Location Area (VMLA), and assigning said VMLA to said mobile station, wherein said VMLA is only modified when the call habits of said mobile station indicate that said mobile station has entered a new cell, having a new base station contained therein, more than once; and

registering the mobile station with each home location register in the local area associated with every base station that the habits of the mobile station indicate will most likely be used by the mobile station.

5,590,399

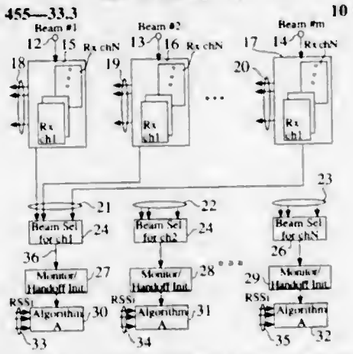
UP-LINK CHANNEL ASSIGNMENT SCHEME FOR CELLULAR MOBILE COMMUNICATIONS SYSTEMS EMPLOYING MULTI-BEAM ANTENNAS WITH BEAM SELECTION

Tadashi Matsumoto, Walnut Creek, and Seiji Nishioka, San Ramon, both of Calif., assignors to Nextel Communications, Lafayette, Calif., and NTT Mobile Communications Network Inc., Tokyo, Japan

Filed Feb. 23, 1995, Ser. No. 393,210

Int. Cl.[6] H04Q *7/30*

U.S. Cl. 455—33.3 **10 Claims**



1. A channel assignment method for a cellular mobile communications system having a multibeam antenna system with beam selection, the method comprising the steps of:

estimating with said antenna a signal-to-interference power ratio ("SIR") for each channel in said cellular communications system by measuring Euclidean distance between a desired signal and a received signal and by averaging said measured distance over several samples;

using said averaged Euclidean distance as a signal quality measure; and

assigning by said antenna a communications channel to each antenna beam of said multibeam system at a cell within said cellular system independently of other cells within said cellular system based upon an SIR derived value by initiating a hand-off process if said quality measure expressed by the averaged Euclidean distance becomes worse than a selected threshold level, selecting a hand-off destination channel from among all available channels in frequency band, and measuring a received composite signal power of the other channels at a base station receiver to determine said hand-off destination.

5,590,400

METHOD OF SEARCHING FOR A SIGNALLING CHANNEL IN A RADIO SYSTEM

Jussi Löppönen, Helsinki, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

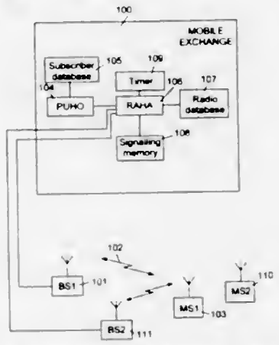
PCT No. PCT/FI94/00118, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO94/23544, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 29, 1994, Ser. No. 347,311

Claims priority, application Finland, Mar. 30, 1993, 931434

Int. Cl.[6] H04Q *7/00*

U.S. Cl. 455—34.2 **2 Claims**



2. A method of searching for a signalling channel in a radio system comprising a mobile exchange, base stations connected therewith, subscriber stations that are connected with the base stations and communicate with the radio system via the channels of the base station via traffic channels and non-dedicated control channels; the method comprising the following steps:

a first subscriber station registered in a first base station listens to a signalling channel of the base station;

the first subscriber station sends a call set-up request that contains signalling data to the radio system, and the radio system stores the signalling data transmitted by the first subscriber station;

the radio system allocates said signalling channel to a second subscriber station for use as a traffic channel since the other channels of the first base station are busy;

the first subscriber station receives a message indicating that the signalling channel used by the first subscriber station is assigned as a traffic channel for communication between the second subscriber station and the first base station;

the first subscriber station stays to listen for a predetermined time to the inband signalling on said signalling channel that has been converted to a traffic channel;

if said signalling channel is released within a predetermined time, the radio system establishes a telecommunication link in accordance with said signalling data, continuing the connection establishment between the first subscriber station and the radio system from where it ended when the signalling channel was allocated to another subscriber station as a traffic channel.

5,590,401

SELECTIVE-CALLING RECEIVER WITH BATTERY SWITCHING UPON CPU STOP DETECTION

Motoki Ide, Tokyo, and Hiroaki Shibayama, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Apr. 18, 1994, Ser. No. 228,962

Claims priority, application Japan, Apr. 16, 1993, 5-113925

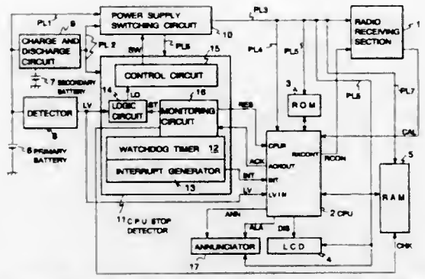
Int. Cl.[6] H04Q *7/18*

U.S. Cl. 455—38.3 **15 Claims**

1. A selective-calling radio receiver comprising:

an exchangeable first battery as a first power supply source;

a second battery as a second power supply source, said second battery being capable of being charged by said first battery;



a CPU which stops operating when a supply voltage of said first battery lowers to a stop voltage, said CPU being unable to operate normally when said supply voltage is equal to or lower than said stop voltage;

a stop detector for detecting operational stop of said CPU due to drop of said supply voltage of said first battery, a minimum operable voltage of said stop detector being lower than said stop voltage; and

a power supply switcher for switching a power supply source for said CPU and said stop detector between said first battery and said second battery;

wherein said first battery is used as said power supply source until said supply voltage of said first battery lowers to said stop voltage;

and wherein said power supply source is switched from said first battery to said second battery when said operational stop of said CPU is detected by said stop detector.

5,590,402

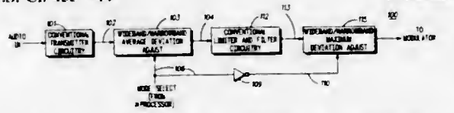
MULTI-MODE TRANSMITTER FOR TRANSMITTER FOR SIGNALS HAVING VARYING DEVIATION LEVELS

Randall J. Samson, Ft. Worth; Allan Budlong, and Dan Huslig, both of Bedford, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 896,707, Jun. 10, 1992, abandoned. This application Apr. 13, 1995, Ser. No. 421,148

Int. Cl.[6] H04B *7/005;7/26*

U.S. Cl. 455—44 **5 Claims**



1. A dual-mode transmitter for automatically adjusting a frequency deviation level of a signal to be transmitted, the transmitter comprising:

means for providing a signal indicating when the transmitter changes from a first mode to a second mode, wherein said first mode is a wideband mode and said second mode is a narrowband mode;

means for attenuating the frequency deviation level of the signal to be transmitted based on a change from said wideband mode to said narrowband mode; and

means, coupled to said means for attenuating, for amplifying the frequency deviation level based on a change from said wideband mode to said narrowband mode.

5,590,403

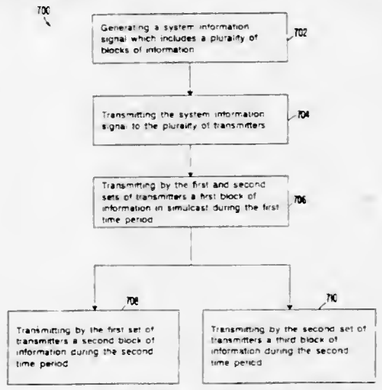
METHOD AND SYSTEM FOR EFFICIENTLY PROVIDING TWO WAY COMMUNICATION BETWEEN A CENTRAL NETWORK AND MOBILE UNIT

Dennis W. Cameron, Jackson, Miss.; Walter C. Roehr, Jr., Reston, Va.; Rade Petrovic, Oxford; Jai P. Bhagat, Jackson, both of Miss.; Masood Garahi, Madison; William D. Hays, Jackson, both of Miss., and David W. Ackerman, Washington, D.C., assignors to Destineer Corporation, Jackson, Miss.

Filed Nov. 12, 1992, Ser. No. 973,918

Int. Cl.[6] H04B *7/06*

U.S. Cl. 455—51.2 **12 Claims**



1. A method for information transmission by a plurality of transmitters to provide broad communication capability over a region of space, the information transmission occurring during at least both a first time period and a second time period and the plurality of transmitters being divided into at least a first and second set of transmitters, the method comprising the steps of:

(a) generating a system information signal which includes a plurality of blocks of information;

(b) transmitting the system information signal to the plurality of transmitters;

(c) transmitting by the first and second sets of transmitters a first block of information in simulcast during the first time period;

(d) transmitting by the first set of transmitters a second block of information during the second time period; and

(e) transmitting by the second set of transmitters a third block of information during the second time period.

5,590,404

BASE STATION TRANSMISSION-RECEPTION APPARATUS FOR CELLULAR SYSTEM

Toshifumi Sato, and Yukitsuna Furuya, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,471

Claims priority, application Japan, Nov. 8, 1993, 5-278208

Int. Cl.[6] H04B *7/04*

U.S. Cl. 455—53.1 **4 Claims**

1. A base station transmission-reception apparatus for a cellular system, comprising:

M sector antennae provided in a number equal to the number of sectors;

M collective modulation-demodulation sections connected to said M sector antennae; and

N baseband signal processing sections provided in a number equal to the number of communication channels and connected to said M collective modulation-demodulation sections;

each of said baseband signal processing sections including:

a control section for controlling a selection signal for controlling a transmission condition;

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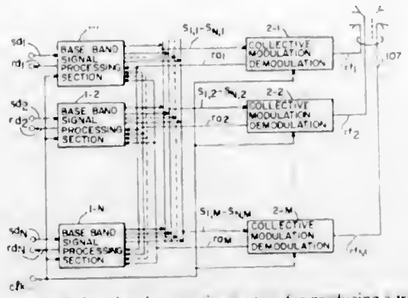


a transmission signal processing section for producing a transmission signal in the form of a digital signal in accordance with a modulation method from transmission data;

a transmission signal selection circuit for outputting the transmission signal from said transmission signal processing section to only one of said sector antennae which is indicated by the selection signal;

a reception signal selection circuit for selecting and outputting one of M reception signals received by said sector antennae which is indicated by the selection signal; and

a reception signal processing section for detecting reception data corresponding to its own communication channel from the reception signal from said reception signal selection circuit;

each of said collective modulation-demodulation sections including:

transmission processing means for converting transmission signals from the transmission signal selection circuits into a transmission radio signal in the form of an analog signal and supplying the resulted signal to said sector antennae;

frequency conversion means for converting reception radio signals of a bandwidth corresponding to the N communication channels received by said sector antennae collectively into a baseband signal by frequency conversion; and

an analog-to-digital converter for converting the base band signal (analog) from said frequency conversion means into a digital signal and supplying the digital signal to the reception signal selection circuits.

5,590,405

COMMUNICATION TECHNIQUE EMPLOYING VARIABLE INFORMATION TRANSMISSION

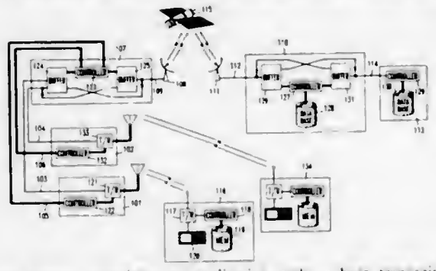
John J. Daly, Neshanic Station; Herman F. Haisch, Holmdel; Peter Kapsales, Middletown; Bala Krishnamurthy, Morganville; Richard A. Miska, Belle Mead; Joseph K. Nordgaard, Fair Haven, and Carl E. Walker, Red Bank, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 29, 1993, Ser. No. 146,372

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 455—54.1 **12 Claims**

1. A method for transmitting information within a communica-



tion system comprising an application node, a base transceiver node and a field transceiver node; said method comprising the steps of:

transmitting information between said field transceiver node and said base transceiver node at a variable data rate via a first fixed bandwidth information channel, wherein said variable data rate is a function of the transmission quality afforded by said first fixed bandwidth information channel, and wherein, prior to the transmission of said information between said field transceiver node and said base transceiver node, the effective rate of said variable data rate information is elevated via bitstuffing or reduced via buffering to match the transmission rate supported by said first fixed bandwidth information channel;

transmitting, from said base transceiver node to said application node, a signal indicative of the present variable data rate at which information is being transmitted between said field transceiver node and said base transceiver node via said first fixed bandwidth information channel; and

varying the data rate at which information is transmitted between said application node and said base transceiver node via a second fixed bandwidth information channel as a function of said received signal indicative of said variable data rate of transmission between said field transceiver node and said base transceiver node, wherein, prior to the transmission of said information between said application node and said base transceiver node, the effective rate of said variable data rate information is elevated via bitstuffing or reduced via buffering to match the transmission rate supported by said second fixed bandwidth information channel.

5,590,406

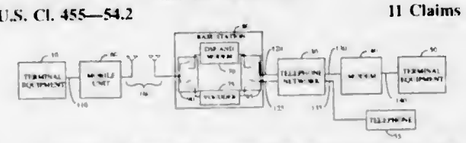
METHOD OF INVOKING AND CANCELING VOICE OR DATA SERVICE FROM A MOBILE UNIT

Gwain Bayley; Matthew S. Grob, both of San Diego; Gadi Karmi, Del Mar; Robert H. Kimball, and David S. Propach, both of San Diego, all of Calif., assignors to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 152,162, Nov. 15, 1993, Pat. No. 5,487,175. This application Apr. 21, 1995, Ser. No. 426,763

Int. Cl.[6] H04B *1/00*

U.S. Cl. 455—54.2 **11 Claims**



1. A method of invoking and canceling voice service and data service in a communication system comprising a mobile unit supporting simultaneous voice and data communication having a keypad for receiving and providing user data and a speaker, microphone, and vocoder unit for receiving and providing encoded voice signals, and a terminal equipment unit input for receiving and providing digital data, said communication system further comprising a base station having a vocoder portion for receiving and providing said encoded voice signals and said user data and a modem portion for receiving and providing said digital data and said user data wherein a wireless link couples said encoded voice signal, said user data, and said digital data between said mobile unit and said base station, comprising the steps of:

receiving at said mobile unit from said terminal equipment input a first modem command within said digital data wherein said first modem command designates a directory number and a request to establish a first voice communication between said mobile unit and said base station; and

receiving said first modem command at said modem portion of said base station and establishing said first voice communication in response to said first modem command such that said encoded voice signals are passed from said speaker, microphone, and vocoder unit over said wireless link to said vocoder portion of said base station and from said vocoder portion of said base station over said wireless link to said speaker, microphone, and vocoder unit.

5,590,407

DRIVE THROUGH WIRELESS ORDER TAKING SYSTEM

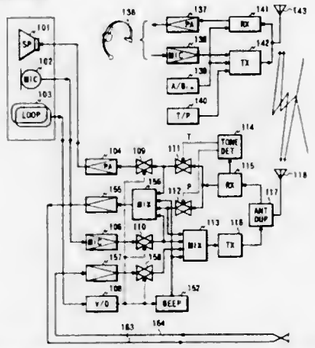
Hideaki Ishikawa, Yokohama, and Atsunao Shinoda, Fujisawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 25, 1995, Ser. No. 533,194

Claims priority, application Japan, Oct. 11, 1994, 6-245573; Oct. 11, 1994, 6-245574

Int. Cl.[6] H04B *7/00*

U.S. Cl. 455—66 **5 Claims**



1. A drive through wireless order taking system comprising:

a base station; and

a slave station being connectable with the base station by radio and being manually movable into and out of a talk lock state at the discretion of an order taker;

wherein the base station comprises means for transmitting a talk lock release signal to the slave station, and the slave station comprises means for automatically moving the slave station out of the talk lock state in response to the talk lock release signal transmitted from the base station.

5,590,408

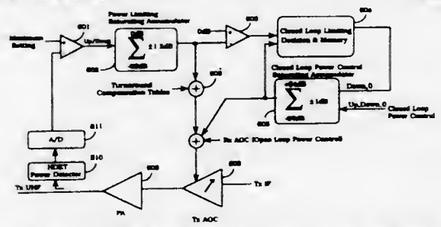
REVERSE LINK, TRANSMIT POWER CORRECTION AND LIMITATION IN A RADIOTELEPHONE SYSTEM

Ana L. Weiland, Encinitas; Richard K. Kornfeld, and John E. Maloney, both of San Diego, all of Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.

Division of Ser. No. 203,151, Feb. 28, 1994, Pat. No. 5,452,473. This application Mar. 20, 1995, Ser. No. 407,543

Int. Cl.[6] H04B *1/04*

U.S. Cl. 455—69 **7 Claims**



1. A method for limiting transmit power of a radio operating in a radio communications system, the radio communications system comprising at least one base station that transmits signals including power control commands to the radio, the radio comprising a variable gain amplifier and a maximum gain setting, the method comprising the steps of:

determining an open loop power control value in response to a signal received from the at least one base station;

determining a gain adjust signal in response to the transmitted power control commands;

combining the open loop power control value and the gain adjust signal to produce a summation signal;

comparing the summation signal to the maximum gain setting;

if the summation signal is greater than or equal to the maximum gain setting, adjusting the variable gain amplifier in response to the maximum gain setting; and

if the summation signal is less than the maximum gain setting, adjusting the variable gain amplifier in response to the summation signal.

5,590,409

TRANSMISSION POWER CONTROL METHOD AND A TRANSMISSION POWER CONTROL APPARATUS

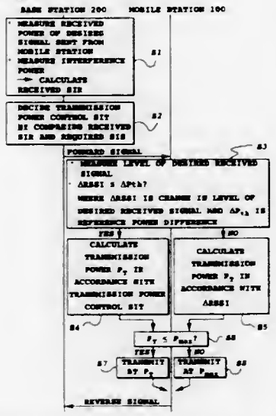
Mamoru Sawahashi, Yokosuka, and Fumiyuki Adachi, Yokohama, both of Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

Filed May 11, 1995, Ser. No. 439,463

Claims priority, application Japan, May 12, 1994, 6-098815; Apr. 3, 1995, 7-077936

Int. Cl.[6] H04B *1/00*

U.S. Cl. 455—69 **4 Claims**



1. A transmission power control method for a CDMA (Code Division Multiple Access) system which controls transmission power of a mobile station on the basis of a transmission power control bit sent from a base station to the mobile station, said method comprising the steps of:

measuring, at the mobile station, average received power per transmission power control period of a signal sent from the base station;

detecting, at the mobile station, a power difference between the average received power of a current transmission power control period and that of one of previous transmission power control periods;

deciding, at the mobile station, whether said power difference exceeds a predetermined reference power difference;

setting, at the mobile station, transmission power of the mobile station in accordance with said power difference when said power difference exceeds said predetermined reference power difference, and in accordance with the transmission power control bit when said power difference is lower than the predetermined reference power difference.

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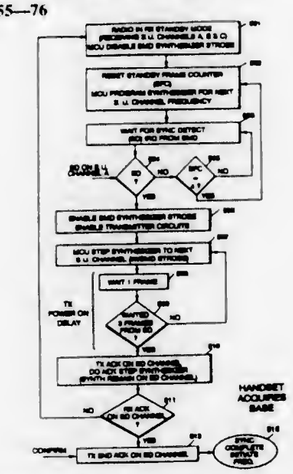
5,590,410
SYSTEM AND METHOD FOR FREQUENCY BASED ACQUISITION ACKNOWLEDGMENT BETWEEN TRANSMITTER AND RECEIVER

Brian M. Deutsch, Maple Valley, and Robert B. Foster, Jr., Bellevue, both of Wash., assignors to American Wireless Corporation, Bellevue, Wash.

Filed Oct. 26, 1994, Ser. No. 329,435
Int. Cl.[6] H04Q *7/20*
U.S. Cl. 455—76 **2 Claims**



1. A communications system comprising:

at least two communications units, each communications unit further comprising a transmitter and a receiver, said transmitter capable of transmitting on a plurality of different frequencies and said receiver capable of receiving on a plurality of different frequencies, and wherein frequency locking is required to insure that each communication unit is operating on a same frequency during a given time frame;

means for predetermining a plurality of n frequencies to be used as set-up channels;

means for establishing a plurality of time frames for transmission and reception of signals on said set-up channels between said units;

means for dividing each said time frame into a transmit period and a receive period;

means for first transmitting, during said transmit period of a first time frame, by an originating unit of said units, a signal on a first one of said plurality of n frequencies;

means for second transmitting, during a transmit period of a next time frame, by said originating unit of said units, a signal on a next one of said plurality of n frequencies;

means for repeating said second transmitting step for each additional frequency in said predetermined plurality of n frequencies;

means for third transmitting, during a transmit period of an n+1 time frame, by said originating unit, a signal on said first one of said plurality of n frequencies, such that in n+1 time frames, a signal has been transmitted on each of said n frequencies and also on said first frequency a second time in said n+1 time frame to complete a cycle of acquisition attempts by said originating unit;

means for first receiving on one of said plurality of n frequencies by a receiver in a second unit in said communications system for n+1 time frames;

means for second receiving on a next one of said plurality of n frequencies by said receiver and said second unit for n+1 time frames;

means for repeating the enabling of said second receiving means for each additional frequency in said n frequencies;

means for repeating the enabling of said first receiving means for n+1 time frames;

means for enabling a transmitter in said second unit as a result of the enabling of said first or second receiving means in said second unit receiving a signal on one of said n frequencies;

means for maintaining said frequency of said receiver in said second unit on one of said n frequencies;

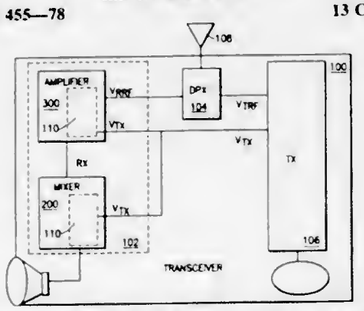
means for fourth transmitting by a transmitter in said second unit, in a transmit period for said second unit of a time frame during which said one of said n frequencies is next received by said receiver in said second unit, a signal on said one of said n frequencies; and

means for repeating the enabling of said last mentioned maintaining means and said fourth transmitting means for an additional time frame to acknowledge acquisition of frequency lock.

5,590,411
METHOD AND APPARATUS FOR SUPPRESSING SPURIOUS THIRD-ORDER RESPONSES IN TRANSCEIVERS

Peter Sroka, West End, and Peter D. Harrison, Ascot, both of England, assignors to Nokia Mobile Phones Ltd., Finland

Filed Jan. 10, 1995, Ser. No. 371,027
Int. Cl.[6] H04B *1/10*
U.S. Cl. 455—78 **13 Claims**



1. Apparatus for inhibiting spurious responses in a receiver section of a transceiver, said receiver section having a non-linear device, said apparatus comprising:

detection means for detecting transmission of a RF signal from the transceiver and outputting a control signal indicative of said transmission; and

linearity control means connected to said detection means and to the non-linear device so as to vary the linearity of said non-linear device in accordance with said control signal.

5,590,412
COMMUNICATION APPARATUS USING COMMON AMPLIFIER FOR TRANSMISSION AND RECEPTION

Tetsuro Sawai, Ashiya; Hisanori Uda, Hirakata; Toshikazu Hirai, Hirakata; Toshikazu Imaoka, Hirakata; Yasoo Harada, Hirakata; Keiichi Honda, Hirakata, and Masao Nishida, Sakai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

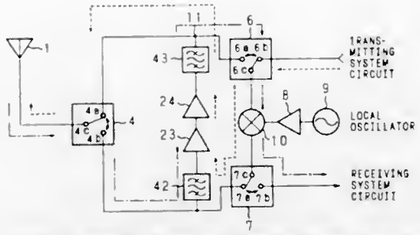
Filed Nov. 18, 1994, Ser. No. 342,220
Claims priority, application Japan, Nov. 19, 1993, 5-290992
Int. Cl.[6] H04B *1/44;* **H03F** *3/193;3/62*
U.S. Cl. 455—82 **19 Claims**

1. A communication apparatus, comprising:

a transmit-receive common amplifier for amplifying a transmitted signal or a received signal;

a transmit-receive common mixer for frequency-mixing the transmitted signal or the received signal with a local oscillator output signal;

a first switch, connected to an input side of said transmit-receive common amplifier, to said mixer and to an input side of a



receiving system circuit, for switching path connection between a transmission path and a reception path;

a second switch, connected to an output side of said transmit-receive common amplifier, to said mixer and to an output side of a transmitting system circuit, for switching path connection between the transmission path and the reception path;

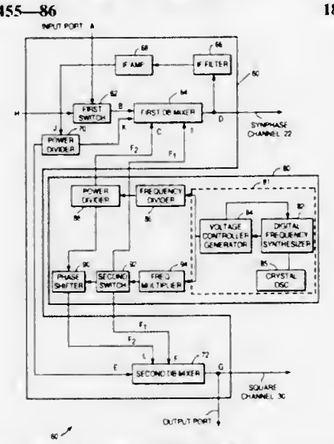
a buffer amplifier disposed on a local oscillation input side of said mixer; and

said transmit-receive common amplifier, said mixer and said buffer amplifier each respectively including an FET as an active element, and a common gate bias being applied to said respective FETs.

5,590,413
RADIO TRANSCEIVER HAVING SHARED MODULATION AND DEMODULATION MIXER CIRCUITS

Victor K. Kondratiev; Valery P. Kouplitchenko, both of Moscow; Alexander V. Galitsky, Moscow-Zelenograd, all of Russian Federation, and Geoffrey G. Baehr, Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jan. 14, 1994, Ser. No. 181,329
Int. Cl.[6] H04B *1/44*
U.S. Cl. 455—86 **18 Claims**



1. A radio having an antenna, comprising:

a reception element configured to receive a reception carrier signal at the antenna;

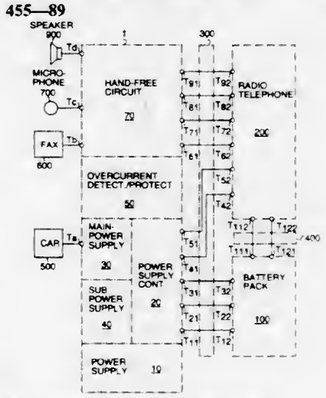
a transmission dement configured to transmit from the antenna a transmission carrier signal with a transmission baseband signal modulated thereon; and

a mixer stage, coupled between the reception element and the transmission element, the mixer stage including a first mixer circuit configured to modulate the transmission baseband signal onto the transmission carrier signal and a second mixer circuit to modulate the transmission carrier signal during transmission of the radio, the first mixer circuit further configured to perform a first down-conversion of the reception carrier signal and to perform a second down-conversion on the reception carrier signal received during reception of the radio.

5,590,414
ADAPTER UNIT FOR A PORTABLE RADIO TELEPHONE ENABLING EITHER ONE OF DATA TRANSMISSION AND HAND-FREE OPERATION

Kuniyoshi Marui, Saitama-ken, and Goichi Sato, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jan. 9, 1992, Ser. No. 818,567
Claims priority, application Japan, Jan. 11, 1991, 3-002291
Int. Cl.[6] H04B *1/40*
U.S. Cl. 455—89 **6 Claims**



1. A radio telephone apparatus comprising:

a portable unit comprising:

(a) a radio telephone comprising an operation mode control responsive to a user-supplied for generating an operation mode control signal, and a transmitter for converting information signals to radio frequency signals and for transmitting the radio frequency signals over a radio communication link;

(b) a first contact-type connector coupled to said radio telephone for receiving information signals external of said portable unit, supplying the information signals to said transmitter, and for outputting the operational mode control signal; and

(c) a power supply control which supplies a POWER-ON signal to said first contact-type connector, said first contact-type connector supplying the POWER-ON signal to a second contact-type connector when said first contact-type connector is attached to said second contact-type connector;

an adapter unit comprising:

(a) said second contact-type connector detachably coupled to said first contact-type connector for outputting information signals to said portable unit and for receiving the operational mode control signal;

(b) a microphone terminal for receiving information signals from a microphone;

(c) a data terminal for receiving information signals from a data transmission device; and

(d) switching means coupled to said second contact-type connector for supplying, in response to the operational mode control signal, the information signals to said second contact-type connector from one of said microphone terminal and said data terminal, whereby the information signals are output from said second contact-type connector to said first contact-type connector, supplied from said first contact-type connector to said transmitter, and are converted to radio frequency signals, which are transmitted by said transmitter over said radio communication link; and

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(e) a power supply control which receives the POWER-ON signal from said second contact-type connector and powers a power supply switch ON in response thereto.

5,590,415

METHOD AND DEVICE FOR SUPERVISING THE CONDITION OF AN ANTENNA

Jukka Peltola, and Pekka Koponen, both of Oulu, Finland, assignors to Nokia Telecommunications OY, Espoo, Finland

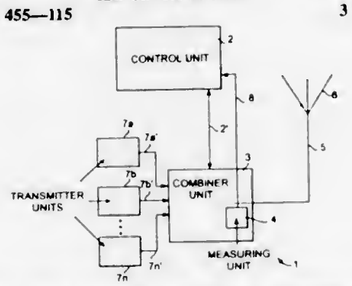
PCT No. PCT/FI94/00138, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/24576, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 13, 1994, Ser. No. 356,214

Claims priority, application Finland, Apr. 14, 1993, 931672

Int. Cl.[6] H04B *17/00*

U.S. Cl. 455—115 **3 Claims**



1. A transmitter antenna diagnostic method, comprising the steps of:

providing a first fixed alarm limit;

transmitting a signal from a transmitter device to an antenna line to an antenna, whereby a portion is reflected from the antenna through the antenna line;

measuring the magnitude of said signal;

measuring the magnitude of said reflected portion of said signal;

providing a measuring signal related to the measured magnitudes of said reflected signal and said transmitted signal, a level of said measuring signal representing a condition of the antenna;

determining said level of said measuring signal by:

a) providing a second alarm limit having an adjustable level,

b) setting said adjustable level of said second alarm limit at a preset level,

c) adjusting said level of the second alarm limit from said present level until said adjustable level reaches said level of said measuring signal,

d) indicating the level of said second alarm limit reaching said level of said measuring signal,

e) determining said level of said measuring signal to be equal to said indicated level of said second alarm limit, and

f) determining a condition of said antenna on the basis of said determined level of said measuring signal; and

switching-off said transmitter device when said level of said measuring signal exceeds said first fixed alarm limit.

5,590,416

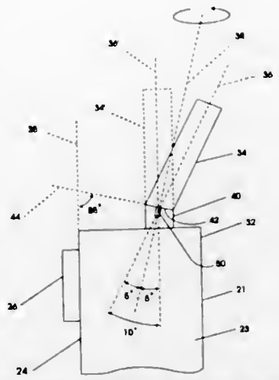
CANTED ANTENNA FOR A CELLULAR RADIOTELEPHONE

Nils R. Rydbeck, Cary, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jun. 8, 1995, Ser. No. 401,024

Int. Cl.[6] H04B *1/38;* **H01Q** *1/12*

U.S. Cl. 455—90 **26 Claims**



1. A cellular radiotelephone comprising:

a radiotelephone body having a front face, said front face defining a first imaginary plane extending therefrom;

an antenna extending from said radiotelephone body and defining an axis, said antenna having a first end surface adjacent said radiotelephone body, said first end surface defining a second imaginary plane intersecting said axis at a non-orthogonal angle;

a boss on said radiotelephone body for receiving said first end surface of said antenna, said boss having an angled surface defining a third imaginary plane extending therefrom said third imaginary plane being parallel to said second imaginary plane, and intersecting said first imaginary plane at a non-orthogonal angle; and

a pin rotatably connecting said first end surface to said angled surface, and forming an orthogonal angle with said first end surface and said angled surface.

5,590,417

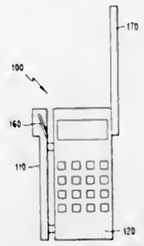
RADIOTELEPHONE APPARATUS INCLUDING A WIRELESS HEADSET

Nils Rydbeck, Cary, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 70,813, Jun. 3, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,327

Int. Cl.[6] H04B *1/40*

U.S. Cl. 455—89 **13 Claims**



1. A radiotelephone apparatus comprising:

a body, including first means for communicating with a radiotelephone network; and

a headset, selectively attachable to the body and including second means for communicating with the body, wherein the second means includes:

means for receiving a modulated carrier signal from a third communications means; and

means for recovering an audio signal from the modulated carrier signal; and the headset further includes:

means for amplifying the audio signal recovered by the recovering means; and

means for converting the audio signal to a sound signal;

wherein the body includes the third means for communicating with the headset in one of two modes and, when the headset is attached to the body, the headset and the body are able to exchange information by wired electrical communication and, when the headset is detached from the body, the headset and the body exchange information by wireless communication; and

the body further includes means for adjusting a gain of the amplifying means.

5,590,418

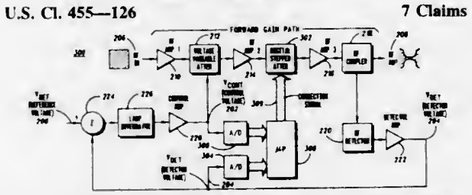
METHOD AND APPARATUS FOR STABILIZING THE GAIN OF A CONTROL LOOP IN A COMMUNICATION DEVICE

Kevin J. Holoubek, Buffalo Grove; Richard J. Keniuk, Cary, and Paul R. Bontrager, Woodstock, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1993, Ser. No. 129,276

Int. Cl.[6] H04B *1/04*

U.S. Cl. 455—126 **7 Claims**



1. A method of stabilizing a control loop in a power amplifier, the control loop including a forward gain path and a reverse gain path, the power amplifier being compatible with a time division multiple access (TDMA) communication system and transmitting information via bursts, the method comprising the steps of:

monitoring a control signal input to the forward gain path and a signal produced in the reverse gain path during a first time period of a burst when a power output of the power amplifier is at a steady-state amplitude;

determining the gain of the control loop based on a ratio of the control signal and the signal produced in the reverse gain path, the signal produced in the reverse gain path based on a level of a signal detected at an output of the forward gain path;

producing a correction signal based on the determined gain of the control loop during a second time period when the power output of the power amplifier is at a steady-state amplitude; and

adjusting the gain of the control loop during a time period between signal bursts utilizing the correction signal to maintain the desired loop bandwidth.

5,590,419

VARIABLE POWER CIRCUIT AND APPARATUS USING THE POWER CIRCUIT

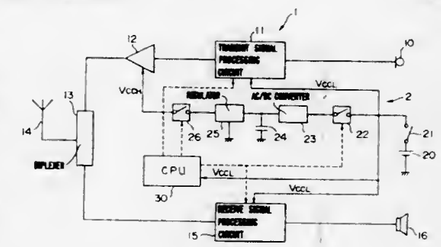
Norio Shimo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1994, Ser. No. 200,665

Claims priority, application Japan, Feb. 26, 1993, 5-039032

Int. Cl.[6] H04B *1/04*

U.S. Cl. 455—127 **9 Claims**



1. A radiocommunication apparatus on a time division multiplex communication system comprising:

a power amplifier circuit for amplifying a transmitted signal intermittently transmitted at predetermined periods to a radio transmission power level;

a signal processing circuit operating at a voltage lower than the operating voltage of said power amplifier circuit;

a battery having a full-charged voltage lower than the operating voltage of said power amplifier circuit and an ultimate voltage higher than the operating voltage of said signal processing circuit, with a large voltage difference between the full-charged voltage and the ultimate voltage;

a stepping up circuit with a small output current capacity for stepping up the output voltage of said battery, changing within the range between the full-charged voltage and the ultimate voltage, at least to the operating voltage of said power amplifier circuit;

a storing circuit for storing power of which the voltage is stepped up by said stepping up circuit; and

switch means provided between said storing circuit and said power amplifier circuit for supplying power stored in said storing circuit to said power amplifier circuit only while said power amplifier circuit is amplifying said transmitted signal.

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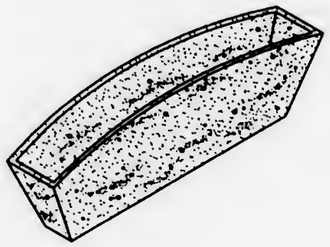
DESIGNS

DECEMBER 31, 1996

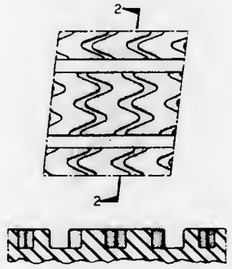
376,893
TORTILLA SHELL
Timothy J. Gornet, 625 Newport Ave., Webster Groves, Mo. 63119
Filed Feb. 8, 1995, Ser. No. 34,610
Term of patent 14 years
U.S. Cl. D1—122



376,894
SKATE BOOT
Todd J. Olson, Chanhassen, Minn., assignor to Rollerblade, Inc, Minneapolis, Minn.
Filed Jun. 7, 1995, Ser. No. 39,917
Term of patent 14 years
U.S. Cl. D2—904

376,895
SANDAL
Gordon Cook, 780 Laird Blvd., Montreal, Que. H3B 1Y6, Canada
Continuation-in-part of Ser. No. 19,097, Feb. 23, 1994, abandoned. This application Feb. 3, 1995, Ser. No. 34,393
Claims priority, application Canada, Nov. 8, 1993, 08-11-93-1
Term of patent 14 years
U.S. Cl. D2—916

376,896
REPEAT PATTERN OF A SHOE SOLE
Nicholas O'Rorke, N. Quincy, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Dec. 22, 1995, Ser. No. 48,244
Term of patent 14 years
U.S. Cl. D2—953



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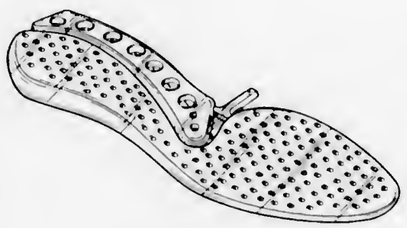
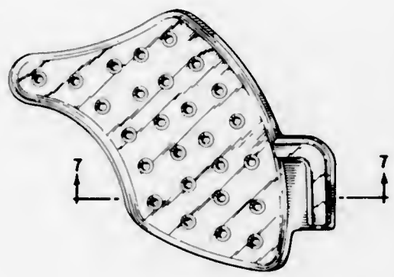
376,897
BLADDER FOR A SHOE SOLE
Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,478
Term of patent 14 years
U.S. Cl. D2—961

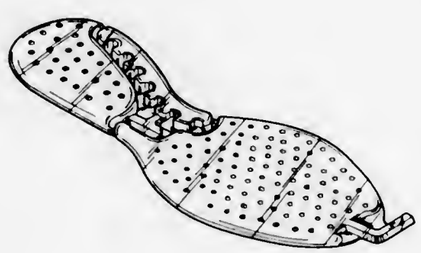


376,899
BLADDER FOR A SHOE SOLE
Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,481
Term of patent 14 years
U.S. Cl. D2—961

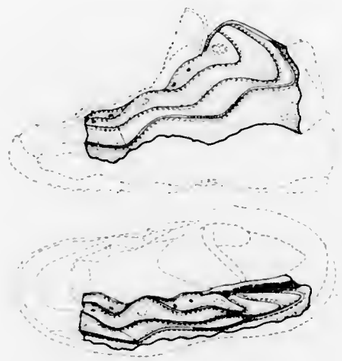


376,900
OUTSOLE CUSHION
Roland Seydel; Juan A. Diaz, both of Lake Oswego, Oreg.; Bruno Kächele, Weilheim/Teck, Germany, and Ian Burgess, Beaverton, Oreg., assignors to Adidas AG, Germany
Filed Jul. 3, 1995, Ser. No. 41,035
Term of patent 14 years
U.S. Cl. D2—968

376,898
BLADDER FOR A SHOE SOLE
Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,480
Term of patent 14 years
U.S. Cl. D2—961

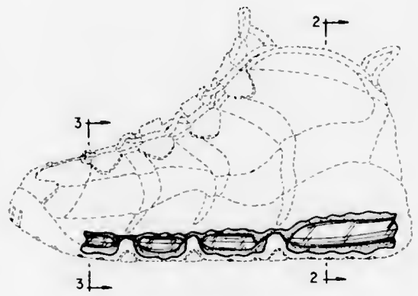


376,901
PORTION OF A SHOE UPPER
Eric P. Avar, Aloha, and Aaron A. C. Cooper, Portland, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Feb. 20, 1996, Ser. No. 50,465
Term of patent 14 years
U.S. Cl. D2—972



376,903
PORTABLE SHADE
Johnel Harris, 215 Timber Oaks Dr., N. Aurora, Ill. 60542
Filed Apr. 17, 1995, Ser. No. 37,534
Term of pateot 14 years
U.S. Cl. D3—5

376,902
ELEMENT OF A SHOE MIDSOLE
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Nov. 20, 1995, Ser. No. 46,544
Term of patent 14 years
U.S. Cl. D2—977



376,904
COMBINED HOLDER, KEY PICTURE DISPLAY AND CONTAINER
Anthony DiRocco, 48 Mississippi Ave., West Orange, N.J. 07052
Filed Oct. 23, 1995, Ser. No. 46,686
Term of patent 14 years
U.S. Cl. D3—208

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376,905

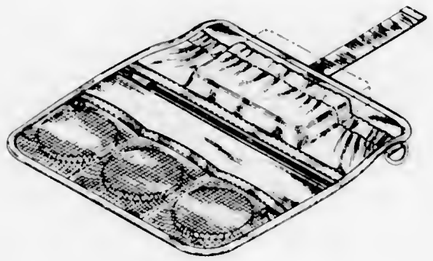
FISHING GEAR CARRYING POUCH

Jason R. Volmer, 12150 Race St. #G204, Northglenn, Colo. 80241

Filed Sep. 13, 1995, Ser. No. 43,887

Term of patent 14 years

U.S. Cl. D3—221



376,906

GOLF BAG

Masahiro Mori, and Masahiko Nagahama, both of Tokyo, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1995, Ser. No. 48,839

Claims priority, application Japan, Mar. 8, 1995, 7-6097

Term of patent 14 years

U.S. Cl. D3—255

376,907

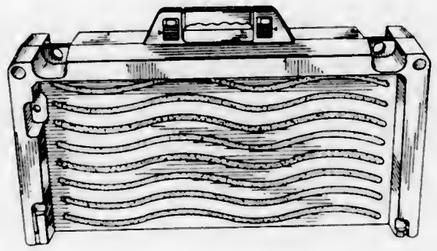
CASE FOR A PORTABLE SHOWER

Jeffrey M. Simpson, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Mar. 17, 1995, Ser. No. 36,120

Term of patent 14 years

U.S. Cl. D3—274



376,908

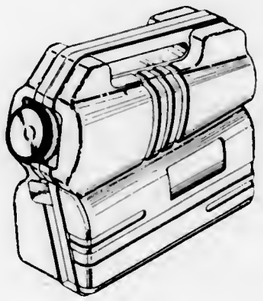
TOOL BOX

Hung-Chi Hsu, No. 30-12, Chue Tzu Tou, Hsi Kang Village, Tainan Hsien, Taiwan

Filed Dec. 7, 1995, Ser. No. 47,578

Term of patent 14 years

U.S. Cl. D3—274



376,909

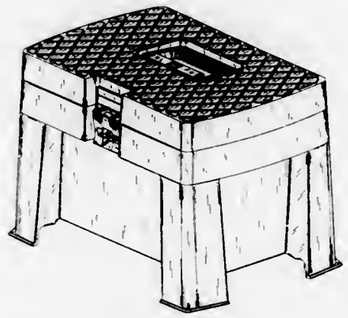
TOOL BOX

Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.

Filed Dec. 27, 1995, Ser. No. 48,808

Term of patent 14 years

U.S. Cl. D3—281



376,910

COMBINED COSMETIC BRUSH AND PERFUME ATOMIZER

Stephan A. Tuchman, 530 Eagle Ave., West Hempstead, N.Y. 11552

Filed Jul. 21, 1994, Ser. No. 26,165

Term of patent 14 years

U.S. Cl. D4—114

376,911

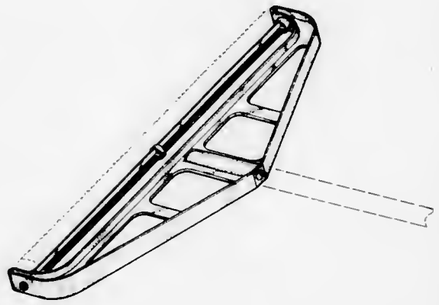
PAINT ROLLER FRAME

Ilan Zigelboim, and Virginia B. Hagan, both of 4955 NW. 82nd Ter., Lauderhill, Fla. 33351

Continuation-in-part of Ser. No. 37,008, Apr. 3, 1995, Pat. No. Des. 369,027. This application Feb. 1, 1996, Ser. No. 49,835

Term of patent 14 years

U.S. Cl. D4—122



376,912

BATHING BRUSH

Arnold J. Stein, 14225 N. Alyssum, Tuscon, Ariz. 85737

Filed Jul. 31, 1995, Ser. No. 42,092

Term of patent 14 years

U.S. Cl. D4—127

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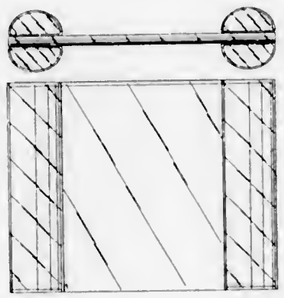
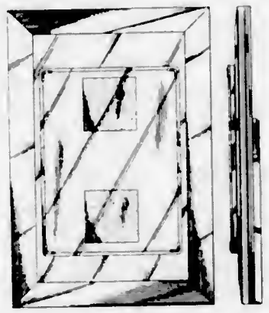
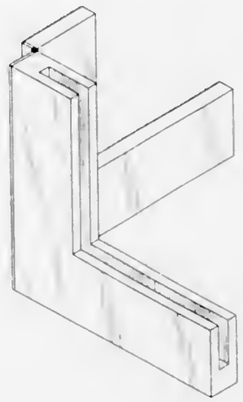
376,913
TWO-DIMENSIONAL PICTURE FRAME
Mary Borden, 48 W. Center St., Akron, Ohio 44308
Filed Jan. 5, 1995, Ser. No. 33,085
Term of patent 14 years
U.S. Cl. D6—300



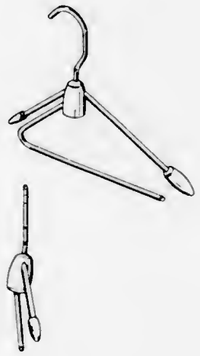
376,914
MIRRORED PICTURE FRAME
John C. Waszkiewicz, III, 11 White Pine Rd., New Hartford, N.Y. 13413
Filed Dec. 14, 1995, Ser. No. 47,917
Term of patent 14 years
U.S. Cl. D6—300



376,915
CORNER UNIT FOR A PICTURE FRAME
John H. van Quach, 1911 SW. Brandon St., Seattle, Wash. 98106
Filed Apr. 5, 1996, Ser. No. 52,552
Term of patent 14 years
U.S. Cl. D6—300

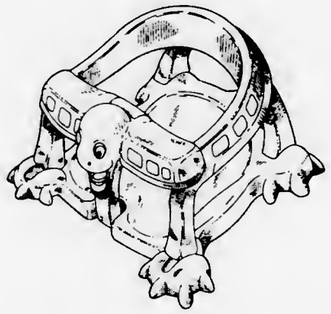


376,916
GARMENT HANGER
Philip R. McDowell, Lake Forest; Robert W. McDowell, Gridley, and Matthew F. McDowell, Santa Monica, all of Calif., assignors to McDowell Bros, Laguna Hills, Calif.
Filed Jul. 14, 1995, Ser. No. 41,451
Term of patent 14 years
U.S. Cl. D6—317

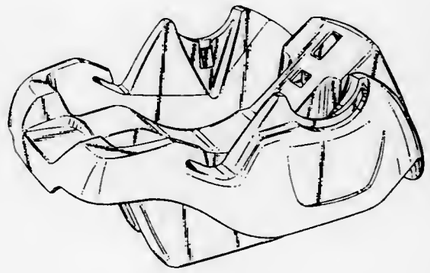


376,917
BOOSTER SEAT
James M. Kain, Tipp City, Ohio, assignor to Cosco, Inc., Columbus, Ind.
Filed Sep. 26, 1995, Ser. No. 44,524
Term of patent 14 years
U.S. Cl. D6—333

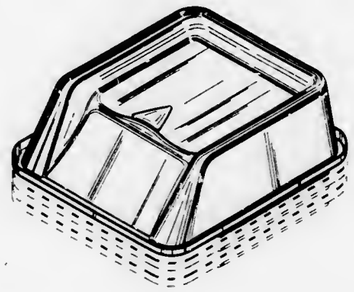
376,918
BATH RING
Keith L. Poulson, Westminster; Robert M. Parker, Aurora, both of Colo.; Jon R. Rossman, Chelmsford, and Bryan R. Hotaling, Arlington, both of Mass., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 7, 1995, Ser. No. 46,091
Term of patent 14 years
U.S. Cl. D6—333



376,919
CAR SEAT BASE
Mark A. Sedlack, Cuyahoga Falls, Ohio, assignor to Century Products Company, Macedonia, Ohio
Filed Nov. 13, 1995, Ser. No. 46,351
Term of patent 14 years
U.S. Cl. D6—333



376,920
BOOSTER SEAT
Gary M. Wood, Charlotte, N.C., assignor to Smart Products, Inc., Charlotte, N.C.
Filed Jan. 16, 1996, Ser. No. 48,938
Term of patent 14 years
U.S. Cl. D6—333



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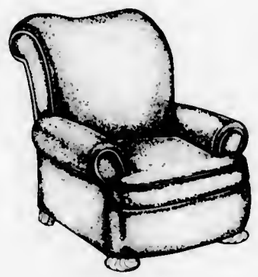
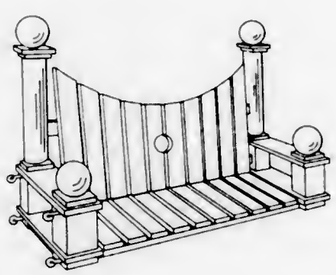
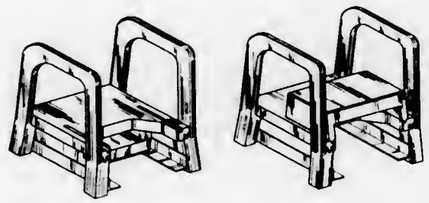
376,921
CHAIR
David P. Chandler, Jamestown, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jan. 22, 1996, Ser. No. 49,291
Term of patent 14 years
U.S. Cl. D6—334



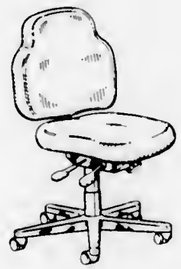
376,922
PORCH SWING
Marilyn M. Hieber, 7445 Steadman, Dearborn, Mich. 48126
Filed Sep. 18, 1995, Ser. No. 44,124
Term of patent 14 years
U.S. Cl. D6—347



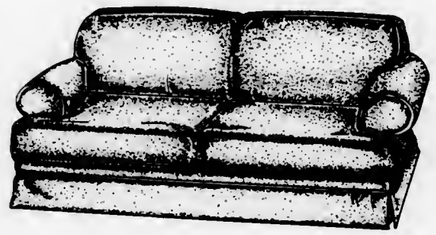
376,923
POTTY STEP
Thomas J. Jones, 3007 Crone Rd., Borden, Ind. 47106
Division of Ser. No. 25,179, Jul. 5, 1994, Pat. No. Des. 365,693. This application Dec. 26, 1995, Ser. No. 49,025
Term of patent 14 years
U.S. Cl. D6—349



376,924
CHAIR
Jocelyn Beaulieu, Newmarket, Canada, assignor to Global Upholstery Company, Downsview, Canada
Filed Jun. 27, 1995, Ser. No. 40,786
Claims priority, application Canada, Apr. 18, 1995, 1995-0825
Term of patent 14 years
U.S. Cl. D6—366

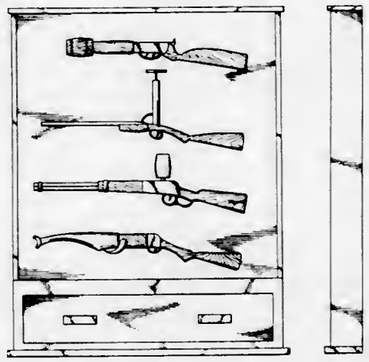


376,925
SEAT
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Feb. 23, 1995, Ser. No. 35,278
Term of patent 14 years
U.S. Cl. D6—381

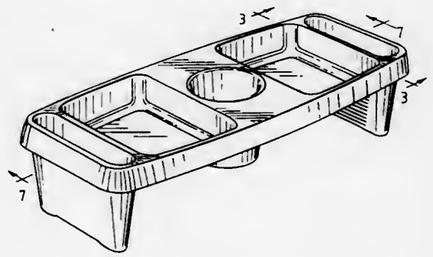


376,926
SOFA
David P. Chandler, Jamestown, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jan. 22, 1996, Ser. No. 49,292
Term of patent 14 years
U.S. Cl. D6—381

376,927
COMBINED MINIATURE GUN COLLECTION AND DISPLAY CASE
Ernest R. Pinder, and Ronna J. Pinder, both of Clifton, Colo.
Filed Jan. 18, 1996, Ser. No. 49,115
Term of patent 14 years
U.S. Cl. D6—397



376,928
LAP TRAY
Moises B. Lorenzana, 601 Lake Hinsdale Dr., Willowbrook, Ill. 60514, and Vance A. Lorenzana, 73 Chippewa Dr., Oswego, Ill. 60543
Filed Apr. 22, 1995, Ser. No. 53,446
Term of patent 14 years
U.S. Cl. D6—406



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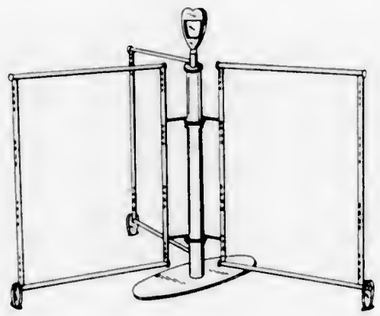
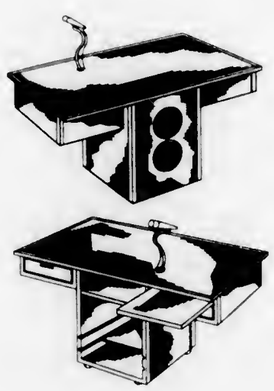
376,929
GARMENT DISPLAY RACK WITH MOVABLE FRAMES
Eugenio Tranquilli, Ponzano Veneto, Italy, assignor to Benetton Group S.p.A., Ponzano-Veneto, Italy
Filed Aug. 1, 1994, Ser. No. 26,581
Claims priority, application Italy, Feb. 4, 1994, M19400060
Term of patent 14 years
U.S. Cl. D6—411



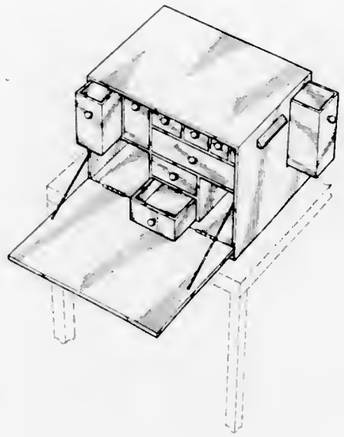
376,930
DESKTOP PODIUM
Stan Kotkosky, 16422 Gentry La., Huntington Beach, Calif. 92647
Continuation-in-part of Ser. No. 23,076, May 17, 1994, abandoned. This application Oct. 2, 1995, Ser. No. 44,878
Term of patent 14 years
U.S. Cl. D6—419



376,931
DESK
Michael A. Fewchuk, Eastwood, Australia, assignor to Sebel Furniture Limited, New South Wales, Australia
Filed Jul. 18, 1995, Ser. No. 41,628
Claims priority, application Australia, Jan. 20, 1995, 165/95
Term of patent 14 years
U.S. Cl. D6—425

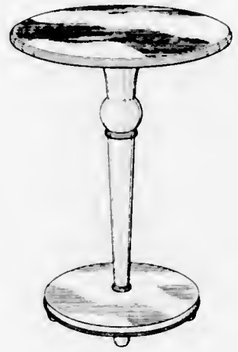
376,932
COMPUTER DESK
Chao-Chuan Hsu; Sun-Yu Wang, and Yee-Chang Liau, all of P.O. Box 453, Taichung, Taiwan
Filed Sep. 21, 1995, Ser. No. 44,402
Term of patent 14 years
U.S. Cl. D6—425

376,933
PORTABLE KITCHEN CABINET
Russell E. Barnhill, 219 Duerr Dr., Bellville, Tex. 77418
Continuation-in-part of Ser. No. 57,494, May 6, 1993, abandoned. This application May 18, 1995, Ser. No. 39,007
Term of patent 14 years
U.S. Cl. D6—445

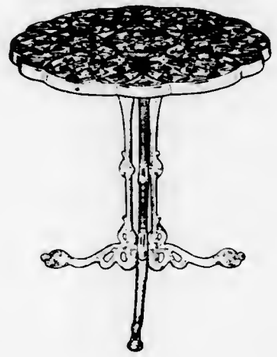


376,934
OVAL TABLE
Gabriel Batki-Braun, Purley, and Bernard Heppenstall, Middle Woodford, both of England, assignors to Faversham Furniture Limited, Faversham, United Kingdom
Filed Feb. 22, 1995, Ser. No. 35,238
Claims priority, application United Kingdom, Aug. 26, 1994, 2041306
Term of patent 14 years
U.S. Cl. D6—480

376,935
OCCASIONAL TABLE
Aagje M. T. Nourse, Fort Worth, Tex., assignor to BBA Holdings, Inc., Wilmington, Del.
Filed Mar. 11, 1996, Ser. No. 51,442
Term of patent 14 years
U.S. Cl. D6—486



376,936
TABLE
Gabriel Batki-Braun, Purley, and Bernard Heppenstall, Middle Woodford, both of England, assignors to Faversham Furniture Limited, Faversham, United Kingdom
Filed Feb. 22, 1995, Ser. No. 35,241
Claims priority, application United Kingdom, Aug. 26, 1994, 2041307
Term of patent 14 years
U.S. Cl. D6—488



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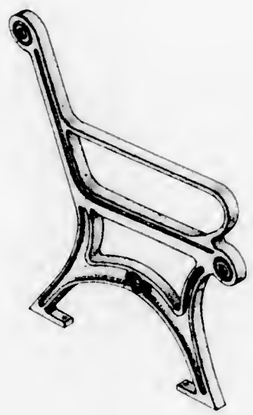
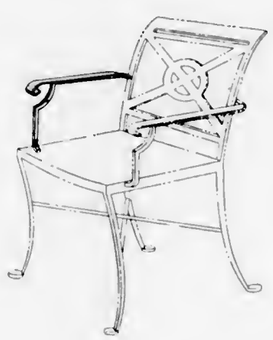
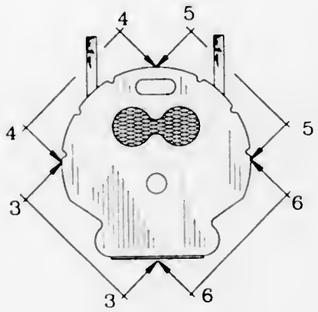
376,937
END FRAME FOR A BENCH
Gerald P. Skalka, Potomac, Md., assignor to Victor Stanley, Inc., Dunkirk, Md.
Filed Dec. 8, 1995, Ser. No. 47,597
Term of patent 14 years
U.S. Cl. D6—492



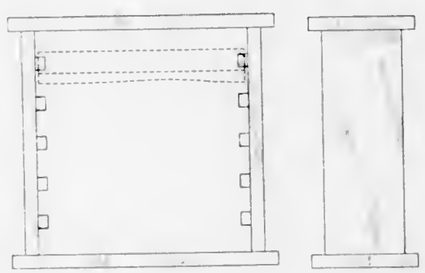
376,938
CHAIR FRAME ARMREST
John Caldwell, San Marino, Calif., assignor to Crown Leisure Products, Inc., Owosso, Mich.
Filed Apr. 28, 1994, Ser. No. 21,986
Term of patent 14 years
U.S. Cl. D6—501



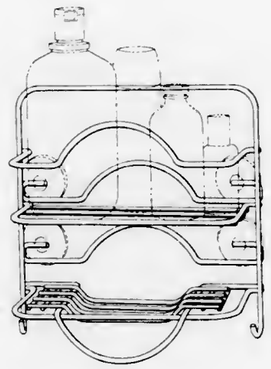
376,939
CLAMSHELL TABLE TOP
Michael T. Credle, Sr., 1205 Wilson Rd., Smithfield, Va. 23430
Filed Dec. 7, 1994, Ser. No. 31,861
Term of patent 14 years
U.S. Cl. D6—511



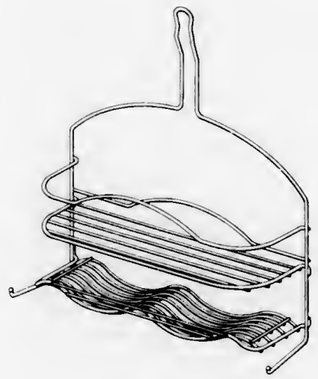
376,940
STANDING FRAME FOR GIFT WRAPPING PAPER
Haskell R. Logan, 1108 Martin Rd., Starr, S.C. 29684
Filed Oct. 6, 1995, Ser. No. 45,044
Term of patent 14 years
U.S. Cl. D6—520



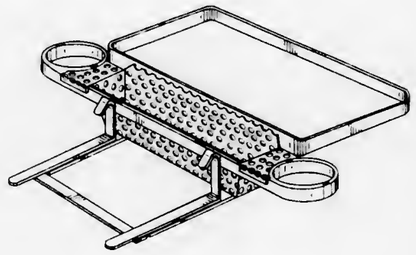
376,941
SHOWER CADDY
Raul Munoz, Chicago, Ill.; Patrick R. Welsh, Wilmington, Del., and Robert W. Matthes, Mechanicsville, Pa., assignors to Selfix, Inc., Chicago, Ill.
Filed Aug. 11, 1995, Ser. No. 42,524
Term of patent 14 years
U.S. Cl. D6—525



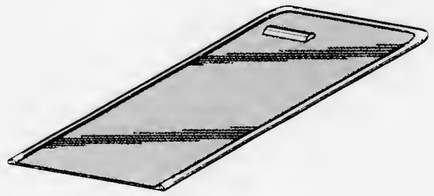
376,942
SHOWER CADDY
Raul Munoz, Chicago, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Dec. 26, 1995, Ser. No. 48,344
Term of patent 14 years
U.S. Cl. D6—525



376,943
EXTENDER FOR ATTACHMENT TO A HOSPITAL OPERATING ROOM MAYO STAND
Sharon Czyszon, 9S631 Lorraine Dr., Hinsdale, Ill. 60521
Filed Oct. 26, 1995, Ser. No. 46,711
Term of patent 14 years
U.S. Cl. D6—567



376,944
GARAGE MAT WITH ADJUSTABLE TIRE INDICATOR
Michael T. Dunn, 19841 Martinsville Rd., Belleville, Mich. 48111
Filed Feb. 6, 1996, Ser. No. 50,014
Term of patent 14 years
U.S. Cl. D6—582



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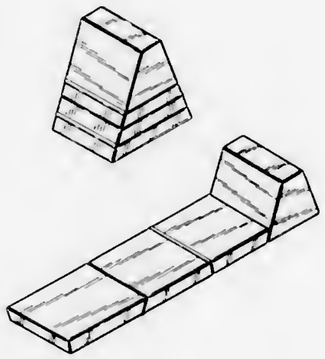
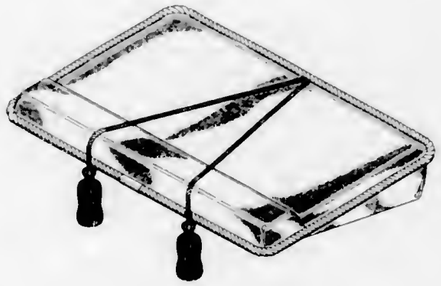
376,945
FOLDABLE MATTRESS
Vincenzo A. Bonaddio, Boothwyn, Pa., and Jose De Jesus Munoz Contreras, Apple Valley, Calif., assignors to Foamex L.P., Linwood, Pa.
Filed Jan. 23, 1995, Ser. No. 33,864
Term of patent 14 years
U.S. Cl. D6—596



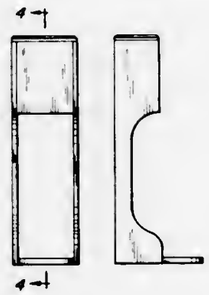
376,946
PORTABLE SEAT TOTE
Michael Maxim, 147 Knipp, Houston, Tex. 77024
Filed Mar. 5, 1996, Ser. No. 51,190
Term of patent 14 years
U.S. Cl. D6—596

376,947
INFANT PLAY PILLOW
Tiffany A. Hill, 4666 Pontchartrain Blvd., New Orleans, La. 70118
Filed Sep. 5, 1995, Ser. No. 43,467
Term of patent 14 years
U.S. Cl. D6—599

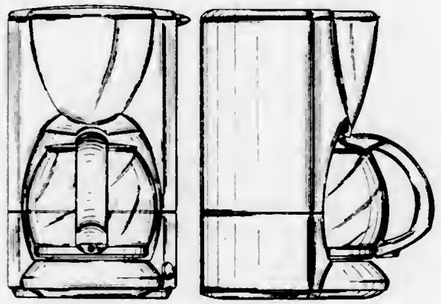
376,948
COMBINED LAP PILLOW AND BOOK SUPPORT
Patrick H. Sullins, and Don M. Jennings, both of Arlington, Tex., assignors to Creative Manufacturing, Inc., Arlington, Tex.
Filed May 11, 1995, Ser. No. 38,660
Term of patent 14 years
U.S. Cl. D6—601



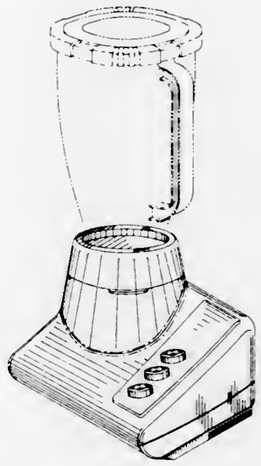
376,949
WINE DISPENSER
Ronald F. Barriault, Lewiston, and Ronald Boucher, Lisbon, both of Me., assignors to Central Distributors, Inc., Lewiston, Me.
Filed Sep. 5, 1995, Ser. No. 43,505
Term of patent 14 years
U.S. Cl. D7—306



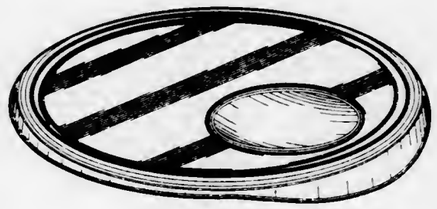
376,950
ELECTRIC COFFEEMAKER
Philippe Saltet, Chateaufort, France, assignor to Moulinex S.A., Paris, France
Filed Jan. 5, 1996, Ser. No. 48,616
Claims priority, application France, Jul. 7, 1995, 95 3745
Term of patent 14 years
U.S. Cl. D7—309



376,951
BLENDER
Anthony B. Rorke, Guilford, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Jan. 11, 1996, Ser. No. 48,681
Term of patent 14 years
U.S. Cl. D7—386



376,952
FOOD STORAGE CONTAINER LID
Kevin Rausch, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Apr. 17, 1995, Ser. No. 37,561
Term of patent 14 years
U.S. Cl. D7—392.1



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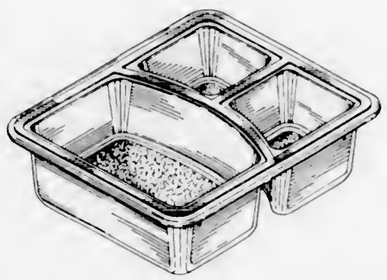
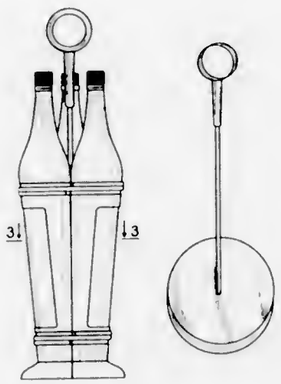
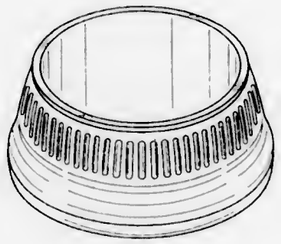
376,953
DISH
John W. Dunn, Durham, Conn., assignor to Design Specialties, Inc., Wallingford, Conn.
Filed Sep. 1, 1995, Ser. No. 43,724
Term of patent 14 years
U.S. Cl. D7—349



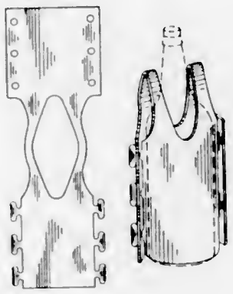
376,955
COMBINED BOTTLES AND STAND
Gagik Petrosyan, 615 S. Adams #1, and Arshak Akopyan, 513 Griswold St. Apt. #9, both of Glendale, Calif. 91205
Filed Feb. 21, 1995, Ser. No. 35,155
Term of patent 14 years
U.S. Cl. D7—598



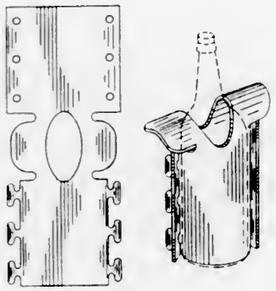
376,954
BOWL
Richard H. Burns, Troy, Ohio, and Allen J. Hutton, Greenfield, Ind., assignors to Seco Products Corporation, Washington, Mo.
Filed Feb. 26, 1996, Ser. No. 50,950
Term of patent 14 years
U.S. Cl. D7—560



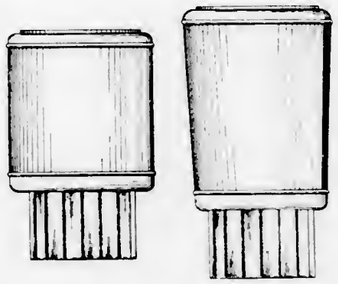
376,956
INSULATED JACKET FOR BEVERAGE CONTAINER
Darren Sharp, 3331 N. Blythe, Fresno, Calif. 93722
Filed Jan. 22, 1996, Ser. No. 50,561
Term of patent 14 years
U.S. Cl. D7—607



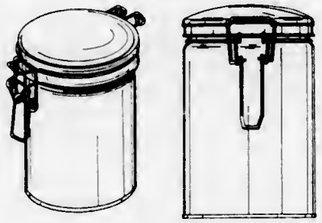
376,957
INSULATED JACKET FOR BEVERAGE CONTAINER
Darren Sharp, 3331 N. Blythe, Fresno, Calif. 93722
Filed Jan. 22, 1996, Ser. No. 50,562
Term of patent 14 years
U.S. Cl. D7—607



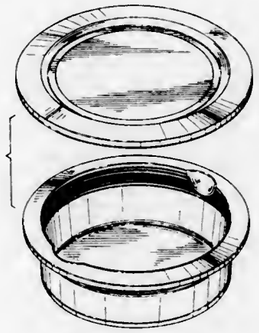
376,959
CARRIER FOR SUPPORTING A BEVERAGE CONTAINER IN AN AUTOMOTIVE CUP HOLDER
Daniel A. Norris, 608 Old Towne La., Alabaster, Ala. 35077
Filed Nov. 2, 1995, Ser. No. 47,052
Term of patent 14 years
U.S. Cl. D7—619



376,958
CANISTER
Jean P. Blanc, Gattieres, France, assignor to Compagnie Mediterraneenne de Cafes, Carros, France
Filed Jan. 21, 1993, Ser. No. 3,889
Claims priority, application France, Jul. 20, 1992, 92 4539
Term of patent 14 years
U.S. Cl. D7—612



376,960
SALAD BOWL
Ian Ferris, Finchampstead, England, assignor to Dart Industries Inc., Orlando, Fla.
Filed Sep. 28, 1995, Ser. No. 43,923
Term of patent 14 years
U.S. Cl. D7—629



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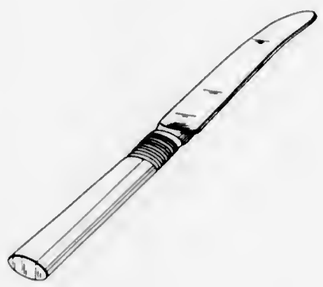
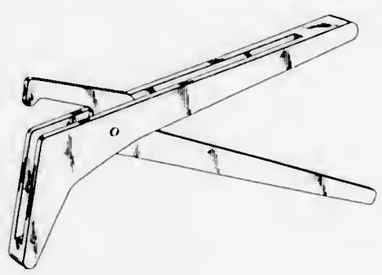
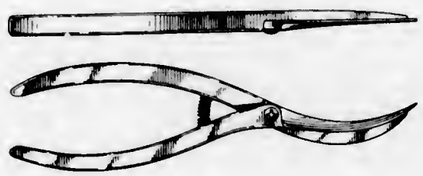
376,961
KNIFE
Signe Persson-Melin, Malmö, Sweden, assignor to Boda Nova International AB, Hoganas, Sweden
Division of Ser. No. 11,706, Aug. 12, 1993, abandoned. This application Apr. 4, 1995, Ser. No. 37,442
Claims priority, application Sweden, Feb. 12, 1993, 93-0372
Term of patent 14 years
U.S. Cl. D7—649



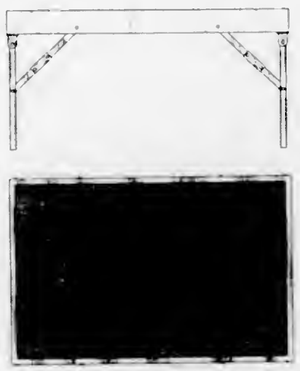
376,962
OVEN-TONGS
Harry Ludvigsson, Lantbruksgatan 12, Mölndal, Sweden, and Eleonore Larsson, Nergårdsvägen 41, Askim, Sweden
Filed Jan. 6, 1995, Ser. No. 33,195
Claims priority, application Sweden, Jul. 7, 1994, 94-1494; Oct. 19, 1994, 94-2075
Term of patent 14 years
U.S. Cl. D7—686



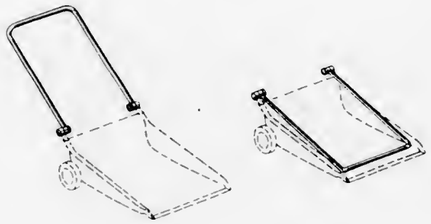
376,963
SHRIMP CLEANING DEVICE
William C. Davis, 2221 Silk Tree Dr., Tustin, Calif. 92680
Filed Mar. 11, 1996, Ser. No. 51,436
Term of patent 14 years
U.S. Cl. D7—693



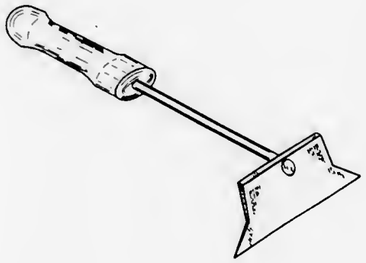
376,964
SIFTER
Joann Lewy, 225 S. Circle Dr., San Gabriel, Calif. 91776
Filed Jan. 29, 1996, Ser. No. 49,542
Term of patent 14 years
U.S. Cl. D8—1



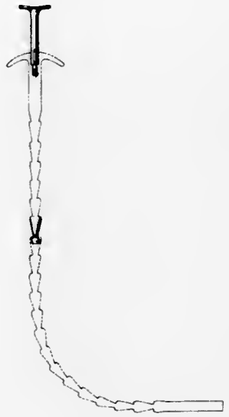
376,965
FOLDING HANDLE FOR A SLEIGH SHOVEL
Kenneth J. Spear, Vienna, W. Va., and Steven F. Brooker, Marietta, Ohio, assignors to O. Ames Co., Parkersburg, W. Va.
Filed Nov. 7, 1995, Ser. No. 46,095
Term of patent 14 years
U.S. Cl. D8—10



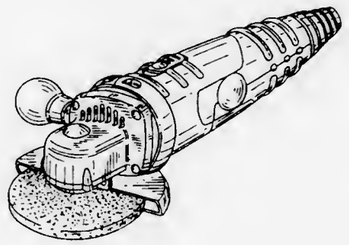
376,966
HAND-HELD DIGGING IMPLEMENT
Jerrold Bartlett, and Glenda Bartlett, both of P.O. Box 348, Clarkston, Wash. 99403-0348
Filed Sep. 18, 1995, Ser. No. 44,131
Term of patent 14 years
U.S. Cl. D8—11



376,967
COMBINED FLEXIBLE PICKUP TOOL COMPONENTS
Kevin S. Fuller, 3675 Gershwin, Oakdale, Minn. 55128
Filed Mar. 29, 1994, Ser. No. 20,596
Term of patent 14 years
U.S. Cl. D8—14



376,968
GRINDER
Kyung T. Kim, Inchon, Rep. of Korea, assignor to LG Industrial Systems Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 28, 1995, Ser. No. 43,377
Claims priority, application Rep. of Korea, Feb. 28, 1995, 95-3416
Term of patent 14 years
U.S. Cl. D8—62



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376,969

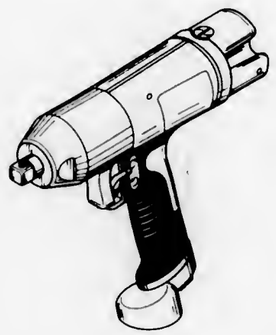
PISTOL HANDLE PULSE TOOL

Yutaka Kazamaki, New Hartford; Joseph Groshans, Clinton; Jeffrey Spooner, West Winfield; Seth Jones, Camden, and Mark Tinklepaugh, Canastota, all of N.Y., assignors to Chicago Pneumatic Tool Company, Utica, N.Y.

Filed May 11, 1995, Ser. No. 38,654

Term of patent 14 years

U.S. Cl. D8—68



376,970

CLAMPING GUN

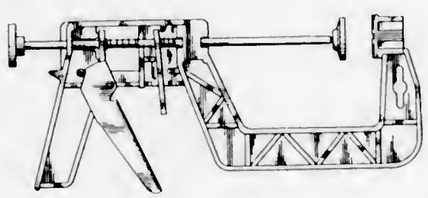
Johannes Drake, Am Richterbusch 18, 33106 Paderborn, Germany

Filed Oct. 19, 1994, Ser. No. 29,928

Claims priority, application Germany, Apr. 21, 1994, M9403408.7

Term of patent 14 years

U.S. Cl. D8—72



376,971

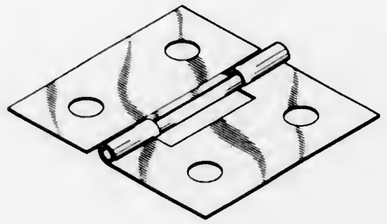
NO-PIN HINGE

Joseph J. Schutz, 61 Colchester Commons, Colchester, Conn. 06415

Filed Jan. 3, 1996, Ser. No. 48,533

Term of patent 14 years

U.S. Cl. D8—327



376,972

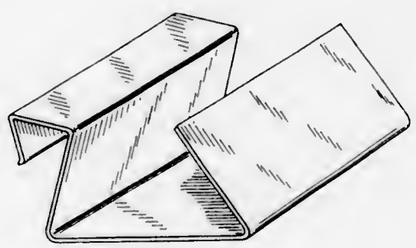
HOLDER FOR BABY WIPES CONTAINER

Diane M. Zissu, Watchung, N.J., assignor to BabySmart, Watchung, N.J.

Division of Ser. No. 89,836, Jul. 12, 1993. This application Mar. 8, 1995, Ser. No. 35,894

Term of patent 14 years

U.S. Cl. D8—354



376,973

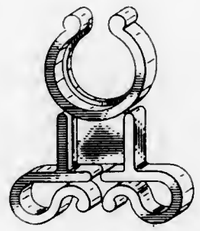
GUTTER CLIP

Peter A. Brown, Lubbock, Tex., assignor to Industrial Molding Corporation, Lubbock, Tex.

Filed Mar. 7, 1995, Ser. No. 35,783

Term of patent 14 years

U.S. Cl. D8—395



376,974

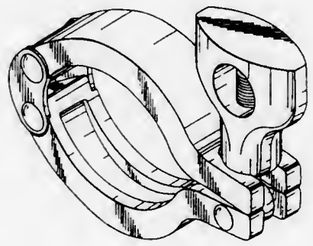
TUBE CLAMP

Waterson Chen, No. 477, Kuo-Kuang Rd., Nan Dist., Taichung City, Taiwan

Filed Nov. 21, 1995, Ser. No. 47,082

Term of patent 14 years

U.S. Cl. D8—396



376,975

COSMETIC TUBE

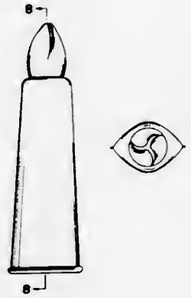
Tetsuo Hiro; Tetsuo Togasawa, both of Tokyo, and Yotsuda Chieko, Yokohama, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan

Filed May 19, 1995, Ser. No. 39,392

Claims priority, application Japan, Nov. 21, 1994, 6-35102

Term of patent 14 years

U.S. Cl. D9—302



376,976

COLLAPSIBLE BOX FOR A DOLL

Erika B. Eicke, and Eberhard Eicke, both of Steineggweg 18, D-79736 Rickenbach, Germany

Filed Nov. 8, 1995, Ser. No. 46,155

Claims priority, application Germany, May 18, 1995, M 95 04 590.2

Term of patent 14 years

U.S. Cl. D9—418

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376,977

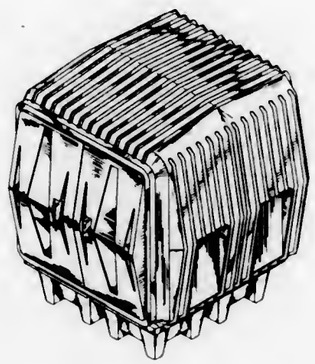
SAFETY CONTAINMENT HOUSING FOR THE STORAGE OF HAZARDOUS WASTE MATERIAL

John O. Milliken, Gates Mills, Ohio, assignor to Enpac Corporation, Chardon, Ohio

Filed Jun. 5, 1995, Ser. No. 39,816

Term of patent 14 years

U.S. Cl. D9—431



376,978

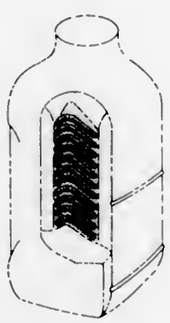
PAIR OF OUTWARDLY RIBBED HANDGRIPS FOR A CONTAINER

Kerry W. Silvers, Chelsea, and Richard P. Entrup, Tecumseh, both of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Mar. 3, 1995, Ser. No. 35,627

Term of patent 14 years

U.S. Cl. D9—434



376,979

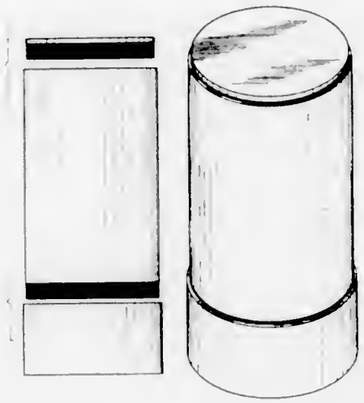
COMBINED CONTAINER AND LIDS

Thomas A. Davidson, III, 13 Glen Ave., Castle Hills, New Castle, Del. 19720

Filed Oct. 23, 1995, Ser. No. 46,687

Term of patent 14 years

U.S. Cl. D9—504



376,980

COMBINED CONTAINER AND CAP

Vincent LoPreto, New York, N.Y., assignor to Cosmair, Inc., New York, N.Y.

Filed Mar. 14, 1995, Ser. No. 36,161

Term of patent 14 years

U.S. Cl. D9—542

376,981

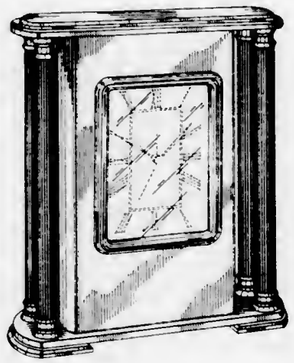
CLOCK

Frederick N. Levinger, Providence, R.I., and Brian LaBrecque, New York, N.Y., assignors to Colibri Corporation, Linden Division, Providence, R.I.

Filed Sep. 1, 1995, Ser. No. 43,407

Term of patent 14 years

U.S. Cl. D10—1



376,982

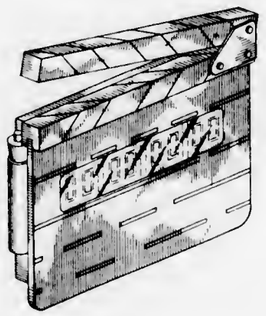
CAMERA SLATE CLOCK

Michael Otto, 33241 Chamizo Calle, Aqua Dulce, Calif. 91350

Filed Dec. 5, 1995, Ser. No. 47,470

Term of patent 14 years

U.S. Cl. D10—6



376,983

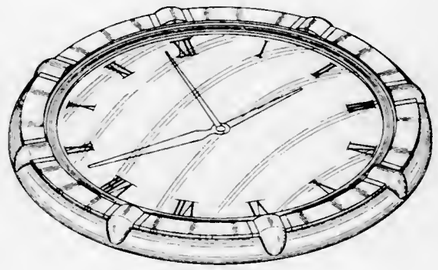
CLOCK

Randy Dieu, 2450 E. 23rd St., Los Angeles, Calif. 90058, assignor to Randy Dieu, Los Angeles, Calif.

Filed Mar. 25, 1996, Ser. No. 52,136

Term of patent 14 years

U.S. Cl. D10—22



376,984

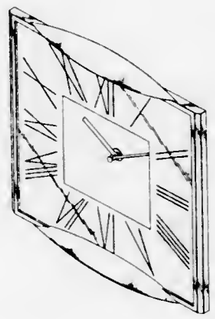
WALL CLOCK

Shan-Ker Moore, Taichung Hsien, Taiwan, assignor to Centre Clock Industry Co., Ltd., Taichung Hsien, Taiwan

Filed Dec. 19, 1995, Ser. No. 48,073

Term of patent 14 years

U.S. Cl. D10—24



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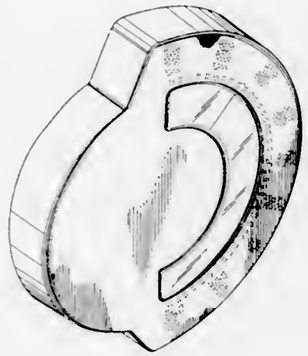
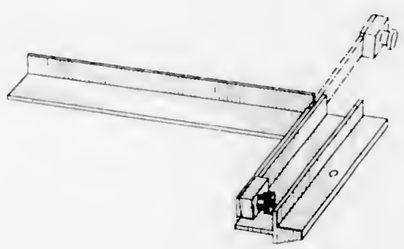
376,985
WRIST WATCH WITH BRACELET
Marie Ikeuchi, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 14, 1995, Ser. No. 42,687
Term of patent 14 years
U.S. Cl. D10—32

376,986
WRIST WATCH
Yoshito Uzawa, and Naoaki Yasukawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Aug. 16, 1995, Ser. No. 42,752
Claims priority, application Japan, Apr. 10, 1995, 7-9950
Term of patent 14 years
U.S. Cl. D10—38

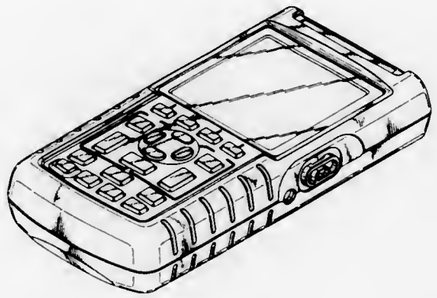
376,987
MEASURING INSTRUMENT
Robert C. Geschwender, 3855 Orchard St., Lincoln, Nebr. 68503
Filed Dec. 15, 1995, Ser. No. 47,944
Term of patent 14 years
U.S. Cl. D10—52



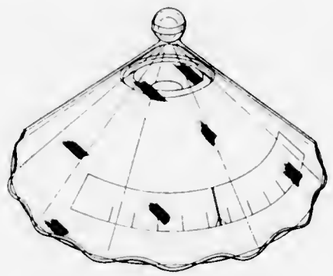
376,988
COMBINATION CUTTING GAUGE AND GUIDE
Anthony T. Bruno, 69 Hawthorne Ave., Neptune City, N.J. 07753
Filed Mar. 15, 1996, Ser. No. 51,709
Term of patent 14 years
U.S. Cl. D10—65



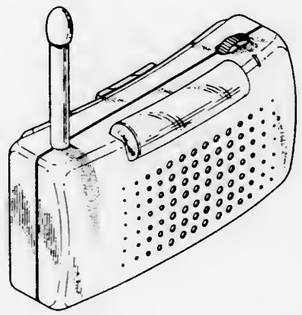
376,989
GRAPHICAL TEST INSTRUMENT
George L. McCain, Almelo, Netherlands, assignor to Fluke Corporation, Everett, Wash.
Filed Sep. 27, 1995, Ser. No. 44,629
Term of patent 14 years
U.S. Cl. D10—78



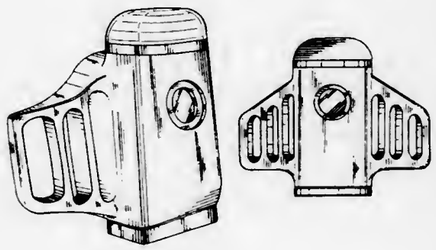
376,990
KITCHEN SCALE
Ennio Pasini, Cesena, and Maurizio Mattei, Macerata, both of Italy, assignors to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Nov. 7, 1995, Ser. No. 46,140
Claims priority, application Italy, May 12, 1995, M19500262
Term of patent 14 years
U.S. Cl. D10—91



376,991
BABY MONITOR RECEIVER
Theodore B. Freese, Westminster, Colo.; Gregory S. Hinzmann, Hillsboro, and Angelika I. Schubert, Portland, both of Oreg., assignors to Gerry Baby Proudcts Company, Thornton, Colo.
Filed Nov. 3, 1995, Ser. No. 46,754
Term of patent 14 years
U.S. Cl. D10—104



376,992
INFRARED BEACON
Gary L. Palmer, Vinton, Va., assignor to ITT Corporation, New York, N.Y.
Filed Nov. 29, 1995, Ser. No. 47,225
Term of patent 14 years
U.S. Cl. D10—106



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376,993

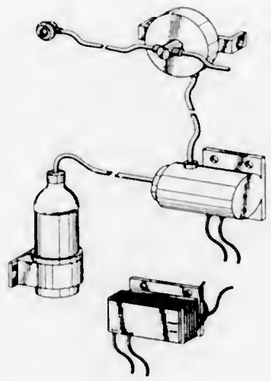
SMOKE GENERATING AUTOMOBILE ALARM UNIT

Joe Epiceno, III, 333 Kirby St., Los Angeles, Calif. 90042

Filed Jan. 16, 1996, Ser. No. 49,093

Term of patent 14 years

U.S. Cl. D10—106



376,994

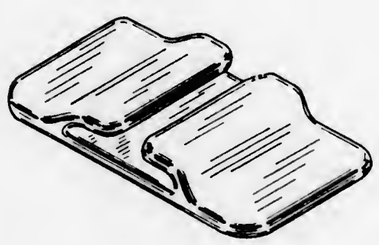
GARMENT STRAPS RETAINER

J. Bernice Norris, 5102 Walnut Grove rd., Memphis, Tenn. 38117

Continuation-in-part of Ser. No. 16,863, Dec. 27, 1993, Pat. No. Des. 358,117, and a continuation of Ser. No. 221,522, Apr. 1, 1994. This application May 3, 1995, Ser. No. 38,322

Term of patent 14 years

U.S. Cl. D11—218



376,995

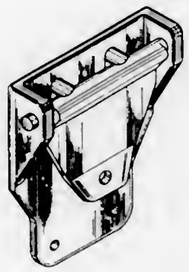
STIRRUP BUCKLE

Ben G. Veach, P.O. Box 322, Greencastle, Ind. 46135, and Robert L. Shields, P.O. Box 623, Newburgh, Ind. 47629

Continuation-in-part of Ser. No. 126,871, Sep. 27, 1993, Pat. No. 5,452,498. This application Jul. 17, 1995, Ser. No. 41,487

Term of patent 14 years

U.S. Cl. D11—216



376,996

TRACK FOR A VEHICLE

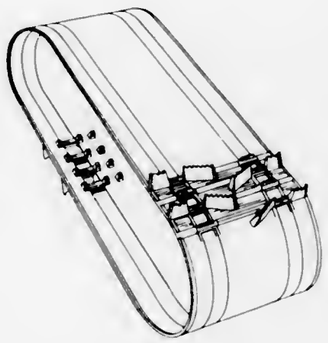
Gilles Soucy; Jean Watelle, and Claude Faucher, all of Drummondville, Canada, assignors to Kimpex, Inc., and Quimpex Limitee, both of Drummondville, Canada

Filed Dec. 12, 1994, Ser. No. 31,979

Claims priority, application Canada, Jun. 22, 1994, 1994-1209

Term of patent 14 years

U.S. Cl. D12—7



376,997

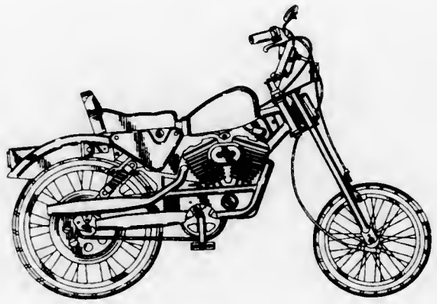
CHOPPER BICYCLE

David K. Camfield, Olney, Ill., assignor to Roadmaster Corporation, Olney, Ill.

Filed Sep. 1, 1995, Ser. No. 43,412

Term of patent 14 years

U.S. Cl. D12—111



376,998

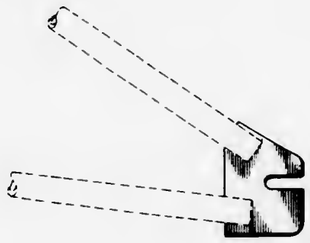
REAR DROPOUT FOR BICYCLE

Michael Stotsky, 1440 W. Nroth Shore Apt. 1W, Chicago, Ill. 60626

Filed Feb. 13, 1996, Ser. No. 50,287

Term of patent 14 years

U.S. Cl. D12—117



376,999

AUTOMOBILE TIRE

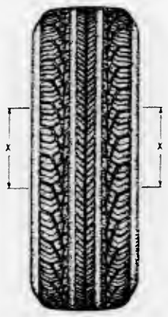
Yoshimasa Hashimoto; Sadakazu Takei; Toshihiko Suzuki, all of Hiratsuka; Izumi Kuramochi, and Hiroshi Tokizaki, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1995, Ser. No. 34,869

Claims priority, application Japan, Aug. 16, 1994, 6-24641

Term of patent 14 years

U.S. Cl. D12—147



377,000

AUTOMOBILE TIRE

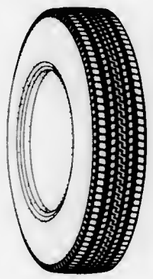
Takashi Kukimoto, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 21, 1995, Ser. No. 42,905

Claims priority, application Japan, Feb. 22, 1995, 7-4338

Term of patent 14 years

U.S. Cl. D12—147



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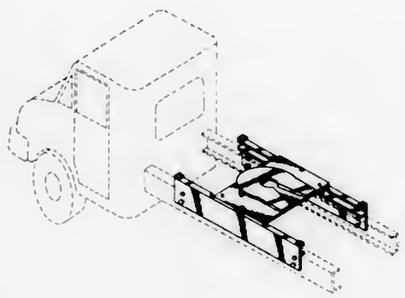
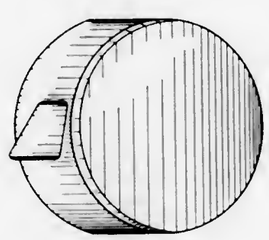
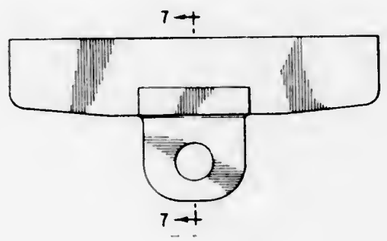
377,001
SLIDING FIFTH WHEEL UNIT
Ronald G. Martin, and Patricia A. Martin, both of 2272 Bolystoo Rd., Ellensburg, Wash. 98926
Filed Dec. 18, 1995, Ser. No. 48,042
Term of patent 14 years
U.S. Cl. D12—161



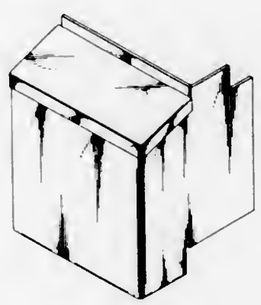
377,002
COMBINED SPOILER AND VEHICLE SPARE TIRE COVER
Nga V. Tran, 18771 Pinto La., Santa Ana, Calif. 92705-2263
Filed May 24, 1995, Ser. No. 39,226
Term of patent 14 years
U.S. Cl. D12—202



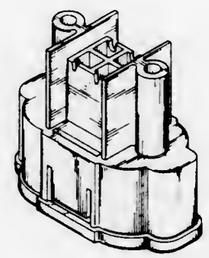
377,003
WINDOW HOLDER FOR A VEHICLE
Toshihito Shimazu, Toyota, and Norihiko Murata, Kasugai, both of Japan, assignors to Nifco Inc., Yokohama, Japan
Filed Dec. 5, 1995, Ser. No. 47,483
Claims priority, application Japan, Jun. 19, 1995, 7-17163
Term of patent 14 years
U.S. Cl. D12—223



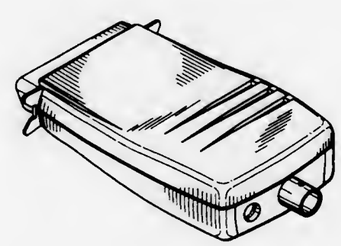
377,004
CONTAINER FOR ARTICLE STORAGE
Fred W. Timms, 3095 Tig Knight Rd., Loganville, Ga. 30249
Filed Dec. 8, 1995, Ser. No. 47,652
Term of patent 14 years
U.S. Cl. D12—423



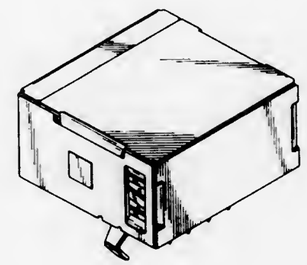
377,005
LAMP SOCKET
Ching-fang Lin, Taipei Hsien, Taiwan, assignor to Golo Chang Company Ltd., Taipei Hsien, Taiwan
Filed Aug. 18, 1995, Ser. No. 42,828
Term of patent 14 years
U.S. Cl. D13—134



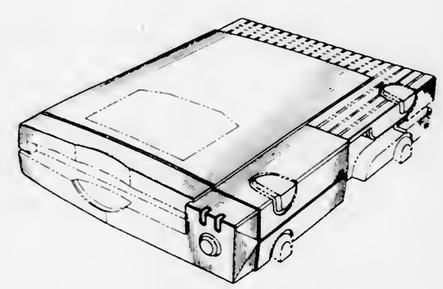
377,006
NETWORK ADAPTOR
Trent L. England, Costa Mesa; Walter D. Kuver, Laguna Hills, both of Calif.; Teddy R. Bryant, Greenville, Tenn., and Shawn G. Hanna, Cupertino, Calif., assignors to Canon Information Systems, Inc., Costa Mesa, Calif.
Filed Jun. 9, 1995, Ser. No. 40,085
Term of patent 14 years
U.S. Cl. D13—147



377,007
SHIELDED CONNECTOR
Haw-Chan Tan, Diamond Bar, and Tim S. L. Chang, Chino Hills, both of Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan
Filed Dec. 8, 1995, Ser. No. 47,635
Term of patent 14 years
U.S. Cl. D13—147



377,008
COMPUTER DATA STORAGE DEVICE
Carl F. Nicklos, Ogden, Utah, and Nicholas Brawne, Columbus, Ohio, assignors to Iomega Corporation, Roy, Utah
Filed Aug. 25, 1995, Ser. No. 48,746
Term of patent 14 years
U.S. Cl. D14—100



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377,009

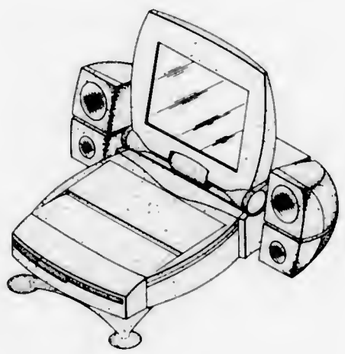
COMPUTER CABINET WITH EXTENDING SPEAKERS

Stanford W. Crane, Jr., Boca Raton; Bruce Smith, Jupiter, both of Fla.; Aaron Lown, New York, N.Y.; Jon P. Otis, New York, N.Y.; Richard J. Schneebeli, Jr., New York, N.Y., and Stephen G. Burks, Brooklyn, N.Y., assignors to The Panda Project, Boca Raton, Fla.

Filed Nov. 16, 1995, Ser. No. 46,826

Term of patent 14 years

U.S. Cl. D14—106



377,010

TELEVISION RECEIVER

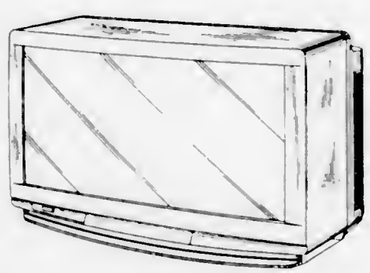
Shigeo Usui, and Mitsunari Fujii, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1995, Ser. No. 43,054

Claims priority, application Japan, Apr. 14, 1995, 7-10448

Term of patent 14 years

U.S. Cl. D14—126



377,011

TELEVISION RECEIVER

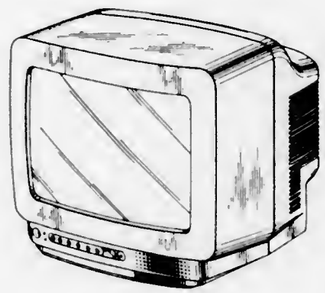
Takashi Inoue, Nara, and Toru Higashibata, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 6, 1995, Ser. No. 43,513

Claims priority, application Japan, Mar. 8, 1995, 7-6263

Term of patent 14 years

U.S. Cl. D14—126



377,012

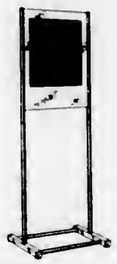
REAR PROJECTION SCREEN

Carl J. Oslund, Eugene, Oreg., assignor to Oslund Design Incorporated, Eugene, Oreg.

Filed Sep. 25, 1995, Ser. No. 44,486

Term of patent 14 years

U.S. Cl. D14—128



377,013

TELEVISION RECEIVER WITH COMPUTER

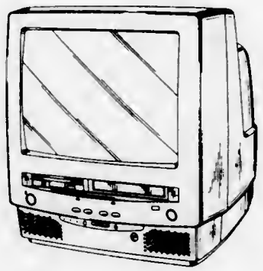
Masakazu Mori, and Tamotsu Senda, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 18, 1995, Ser. No. 44,118

Claims priority, application Japan, Mar. 17, 1995, 7-7381

Term of patent 14 years

U.S. Cl. D14—129



377,014

PORTABLE TELEPHONE HANDSET

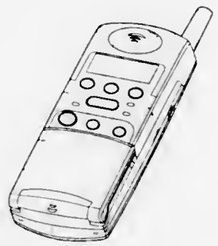
Daniel R. Biskup, Somerset; Pratod V. Kasbekar, Manalapan, both of N.J.; Michael J. Nuttall, Portola valley, Calif.; Heidi A. Rajan, Morganville, N.J.; Christopher A. Robinette, Woodside, Calif.; John H. Schaffeld, New Vernon, and Chaonong Yoh, Matawan, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 4, 1995, Ser. No. 33,030

The portion of the term of this patent subsequent to Dec. 3, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—138



377,015

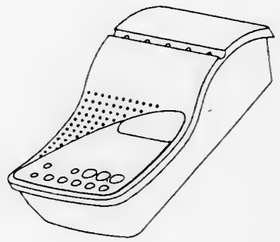
SHOWER SPEAKER TELEPHONE HANDSET

Joseph E. Ford, Cary; Donald N. Jursich, Chicago, both of Ill., and Raymond Chan, Vancouver, Canada, assignors to Jing Mei Industrial Holdings, Ltd.

Filed Oct. 18, 1995, Ser. No. 46,634

Term of patent 14 years

U.S. Cl. D14—149



377,016

TELEPHONE SET

Josh Zeitman, Brooklyn, N.Y., assignor to Lenoxx Electronics Corp., Brooklyn, N.Y.

Filed Jun. 27, 1995, Ser. No. 40,817

Claims priority, application United Kingdom, May 5, 1995, 2047264

The portion of the term of this patent subsequent to Jun. 4, 2010, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—151

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377,017

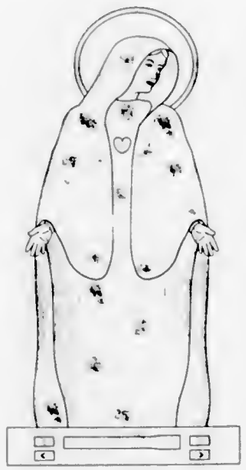
RELIGIOUS STATUE CASSETTE PLAYER

John Giumarra, #1 Bryant Crescent - Apt. 1-1, White Plains, N.Y. 10607

Filed Mar. 19, 1996, Ser. No. 51,827

Term of patent 14 years

U.S. Cl. D14—164



377,018

PAGER

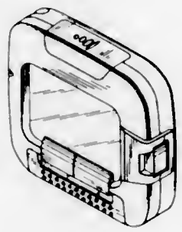
Masataka Suzuki, and Shuji Yamaguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1995, Ser. No. 44,699

Claims priority, application Japan, Mar. 31, 1995, 7-8923

Term of patent 14 years

U.S. Cl. D14—191



377,019

PAGER

Katsumi Nagano, and Yuko Komamiya, both of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1995, Ser. No. 47,978

Claims priority, application Japan, Aug. 2, 1995, 7-22823

Term of patent 14 years

U.S. Cl. D14—191

377,020

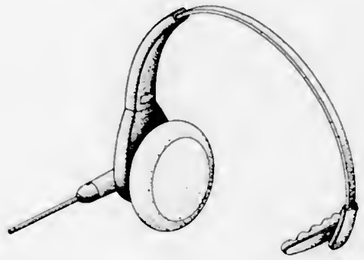
COMMUNICATIONS HEADSET

Gabriele Bungardt, Aptos, Calif.; Luis Pedraza, West Roxbury, Mass., and Tim Dearborn, Rochester Hills, Mich., assignors to Plantronics, Inc., Santa Cruz, Calif.

Filed Apr. 19, 1995, Ser. No. 37,706

Term of patent 14 years

U.S. Cl. D14—205



377,021

HEADPHONE

Rie Isono, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 43,195

Term of patent 14 years

U.S. Cl. D14—205

377,022

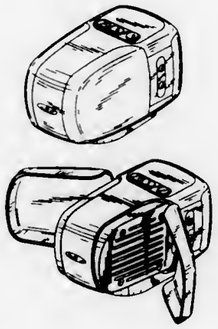
SPEAKER BOX

Hitoshi Takahashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 3, 1995, Ser. No. 42,182

Term of patent 14 years

U.S. Cl. D14—214



377,023

UNTETHERED COMMUNICATIONS/MEDIA HANDSET

Douglas Andrea, New York, N.Y., assignor to Andrea Electronics Corportion, Long Island City, N.Y.

Filed Jun. 5, 1995, Ser. No. 39,769

Term of patent 14 years

U.S. Cl. D14—218

377,024

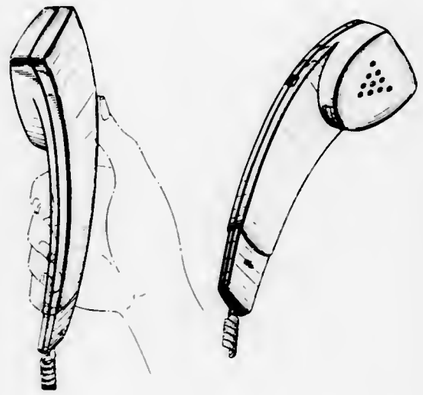
TETHERED MEDIA/COMMUNICATION HANDSET

Douglas Andrea, New York, N.Y., assignor to Andrea Electronics Corportion, Long Island City, N.Y.

Continuation-in-part of Ser. No. 39,769, Jun. 5, 1995. This application Feb. 14, 1996, Ser. No. 50,326

Term of patent 14 years

U.S. Cl. D14—218



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377,025

IMITATION EAGLE ANTENNA

Carl W. Leu, Miami, Fla., assignor to Poli-Auto, Inc., Miami, Fla.

Division of Ser. No. 17,935, Jan. 26, 1994, Pat. No. Des. 363,071, which is a continuation-in-part of Ser. No. 5,923, Mar. 12, 1993, Pat. No. Des. 347,226. This application Jun. 30, 1995, Ser. No. 40,981

Term of patent 14 years

U.S. Cl. D14—230

377,026

DISPLAY PANEL FOR A SELECTIVE CALL RECEIVER

Anthony W. Cuteri, Lantana; Barry S. Boes, Boynton Beach, and Arturo Heinsen, Delray Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 18, 1995, Ser. No. 44,127

Term of patent 14 years

U.S. Cl. D14—257

377,027

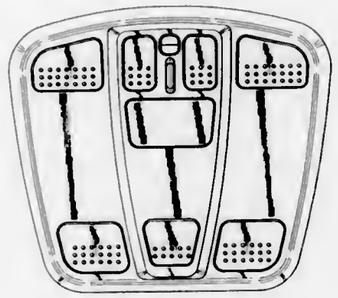
TROLLING MOTOR FOOT PEDAL CONTROL

Calvin Tyler, Gadsen, Ala.; Prentice Moore, Starkville, Miss., and Jack Robbins, Derby, Kans., assignors to Brunswick Corportion, Lake Forest, Ill.

Filed Apr. 21, 1995, Ser. No. 37,865

Term of patent 14 years

U.S. Cl. D15—4



377,028

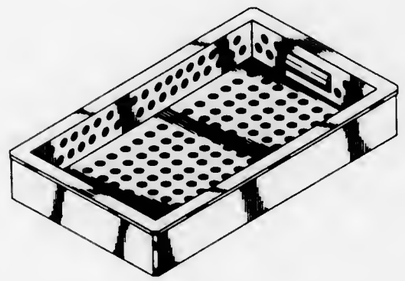
ICE HOLDING AND DRAINING BASKET

Ronald Monday, 812 Berkshire La., Carol Stream, Ill. 60188

Filed May 8, 1995, Ser. No. 38,541

Term of patent 14 years

U.S. Cl. D15—90



377,029

DRILL BIT FINGER

Gavin T. McLeod, 21B Hertford Close, Bullcreek, Western Australia 6154, and Matthew V. Egan, 21 San Miguel Drive, Leeming, Western Australia 6155, both of Australia

Filed Jun. 7, 1995, Ser. No. 40,007

Claims priority, application Australia, Dec. 15, 1994, 4179/94

Term of patent 14 years

U.S. Cl. D15—139

377,030

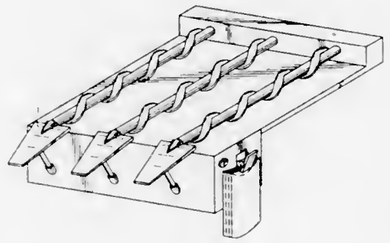
SAND BAG FILLING DEVICE

James J. Spear, 1321 N. 76th East Ave., Tulsa, Okla. 74115

Filed Dec. 15, 1995, Ser. No. 47,883

Term of patent 14 years

U.S. Cl. D15—145



377,031

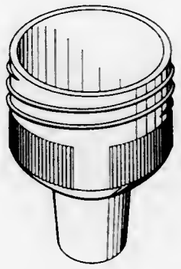
THREADED FUNNEL

Emmanuel R. Didier, 111 Marquez Pl., Pacific Palisades, Calif. 90272

Filed Nov. 14, 1995, Ser. No. 46,424

Term of patent 14 years

U.S. Cl. D15—150



377,032

VIDEO CAMERA

Takashi Morooka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1995, Ser. No. 41,604

Term of patent 14 years

U.S. Cl. D16—202

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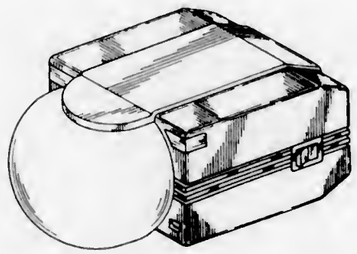
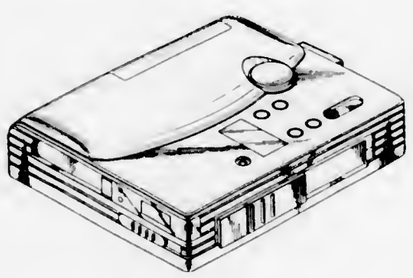
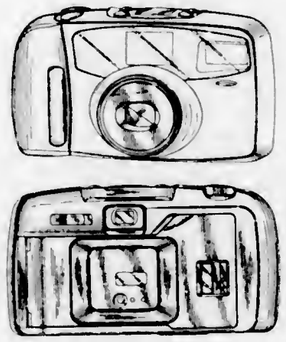
377,033
TV CAMERA
Mineo Kubota, Kofu, and Masayoshi Satou, Yamanashi-ken, both of Japan, assignors to Nisca Corporation, Yamanashi-ken, Japan
Filed Dec. 19, 1995, Ser. No. 48,044
Term of patent 14 years
U.S. Cl. D16—202



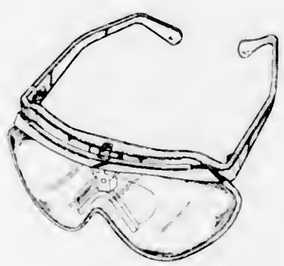
377,034
DIGITAL CAMERA
Takeshi Matsushita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushikl Kaisha, Tokyo, Japan
Filed Jan. 18, 1996, Ser. No. 49,136
Claims priority, application Japan, Jul. 18, 1995, 7-20687
Term of patent 14 years
U.S. Cl. D16—202



377,035
35 MM CAMERA
Tatsuyuki Hayashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 18, 1996, Ser. No. 49,137
Claims priority, application Japan, Jul. 18, 1995, 7-20686
Term of patent 14 years
U.S. Cl. D16—209

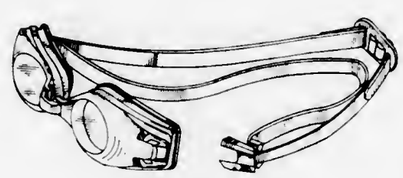


377,036
SPORTS EYEWEAR
Peter F. Leonardi, Gloversville, N.Y., assignor to Halo Sports and Safety, Inc., Gloversville, N.Y.
Filed Jan. 26, 1996, Ser. No. 49,504
Term of patent 14 years
U.S. Cl. D16—304

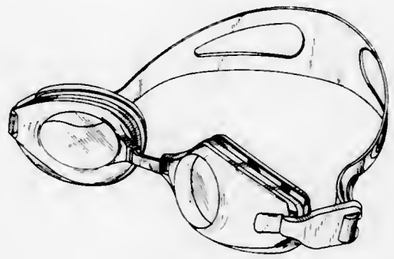


377,037
COMBINED EYE WEAR AND FLEXIBLE STRAP TEMPLES
Jill L. Stolt, 31 Edmonds St., Rochester, N.Y. 14607
Filed Feb. 21, 1995, Ser. No. 35,433
Term of patent 14 years
U.S. Cl. D16—306

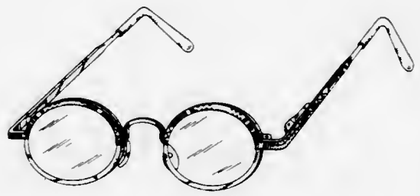
377,038
SWIMMING GOGGLES
Tomoyuki Yashiro, Osaka, Japan, assignor to Yamamoto Kogaku Co., Ltd., Higashi-Osaka, Japan
Filed Jan. 30, 1996, Ser. No. 49,722
Claims priority, application Japan, Aug. 21, 1995, 7-24227
Term of patent 14 years
U.S. Cl. D16—311



377,039
SWIMMING GOGGLES
Kimiko Minamidani, Higashi-Osaka, Japan, assignor to Yamamoto Kogaku Co., Ltd., Higashi-Osaka, Japan
Filed Jan. 30, 1996, Ser. No. 49,752
Claims priority, application Japan, Aug. 3, 1995, 7-22985
Term of patent 14 years
U.S. Cl. D16—311



377,040
EYEGLASSES
Carlos A. Khantzis, Woodland Hills, and Ruta Z. Empakeris, Santa Monica, both of Calif., assignors to California Design Studio Inc., Westlake Village, Calif.
Filed Dec. 18, 1995, Ser. No. 48,017
Term of patent 14 years
U.S. Cl. D16—317



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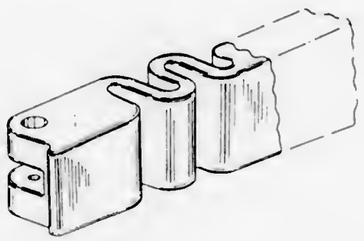
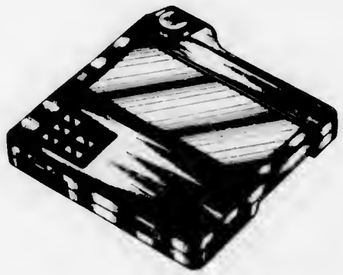
377,041
HINGE END OF EYEGLASS TEMPLE
Louis Garneau, Québec, Canada, assignor to Louis Garneau Sports Inc., Canada
Filed Apr. 12, 1996, Ser. No. 53,040
Term of patent 14 years
U.S. Cl. D16—335



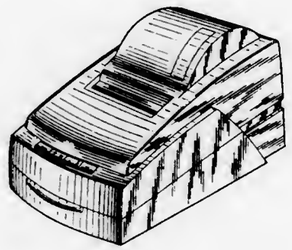
377,042
ELECTRONIC CALCULATOR HAVING THE FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK, CALENDAR, SCHEDULE BOOK AND MEMO BOOK
Tomoshige Komatsu, Tokyo, and Junichi Ono, Kawasaki, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1995, Ser. No. 48,293
Term of patent 14 years
U.S. Cl. D18—2

377,043
ELECTRONIC CALCULATOR
Kenji Takahata, Hino, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1995, Ser. No. 48,296
Term of patent 14 years
U.S. Cl. D18—7

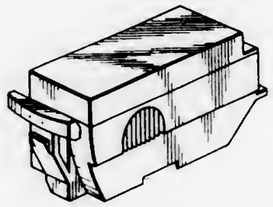
377,044
PROJECTION UNIT FOR AN ELECTRONIC CALCULATOR
Hideaki Yamabe, Yokohama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 2, 1995, Ser. No. 38,259
Term of patent 14 years
U.S. Cl. D18—12



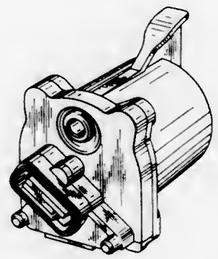
377,045
PRINTER
Hiromi Chida, Chiba, Japan, assignor to Seiko Instruments Inc., Japan
Filed Oct. 18, 1995, Ser. No. 45,400
Term of patent 14 years
U.S. Cl. D18—50



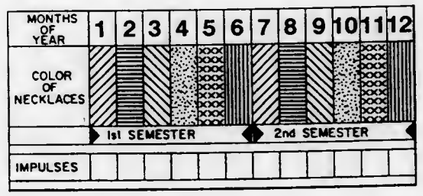
377,046
INK CARTRIDGE FOR PRINTER
Naoki Tashiro; Toshihiko Ujita; Teruo Arashima; Yuji Hamasaki; Hisashi Yamamoto, and Wataru Takahashi, all of c/o Canon Kabushiki Kaisha 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan
Filed Aug. 4, 1995, Ser. No. 42,240
Claims priority, application Japan, Feb. 6, 1995, 7-2791
Term of patent 14 years
U.S. Cl. D18—56



377,047
PRINTING HEAD FOR PRINTER
Shoichi Ishizawa, and Atsushi Nishioka, both of Suwa, Japan, assignors to Seiko Epson Corporation, Japan
Filed Oct. 2, 1995, Ser. No. 44,877
Claims priority, application Japan, Apr. 13, 1995, 7-10249
Term of patent 14 years
U.S. Cl. D18—56



377,048
FORM TO MONITOR RATIONS OF DAIRY COWS
John M. Pacheco De Carvalho, P-7100, Estremoz, Portugal
Filed Jan. 6, 1995, Ser. No. 33,198
Term of patent 14 years
U.S. Cl. D19—1



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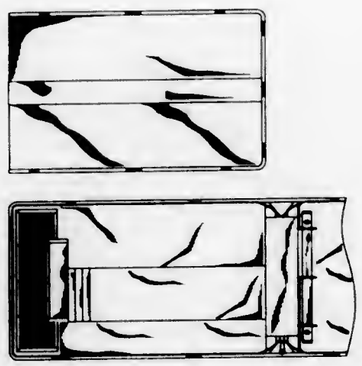
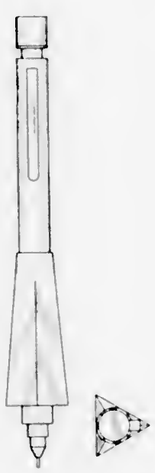
377,049
DOCUMENT CASE
James T. M. Guyer, 3115 Kensington St., Tampa, Fla. 33629, and Michael L. Cone, 6735 S. Lois Ave., Tampa, Fla. 33616
Filed Sep. 15, 1994, Ser. No. 28,434
Term of patent 14 years
U.S. Cl. D19—27

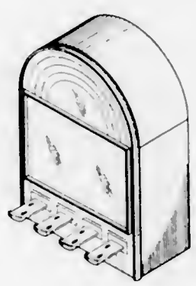


377,050
MECHANICAL PENCIL WITH ATTACHED MOLDED PENCIL GRIP
Fayez Azeez, 40 Hollis Rd., East Brunswick, N.J. 08816-2754
Filed May 6, 1996, Ser. No. 54,075
Term of patent 14 years
U.S. Cl. D19—49



377,051
WRITING PEN
Shun Takemura, Torrance, Calif., assignor to Itoya of America, Ltd., Torrance, Calif.
Filed Apr. 23, 1996, Ser. No. 53,489
Term of patent 14 years
U.S. Cl. D19—51

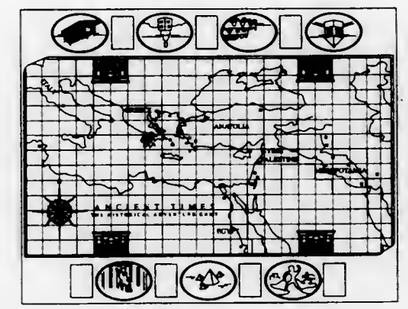
377,052
VENDING MACHINE
Robert H. Woodard, Ventura, Calif., assignor to Accurate Engineering Precision Sheet Metal Fabrication and Machining, Inc., Newbury Park, Calif.
Filed Oct. 13, 1995, Ser. No. 46,616
Term of patent 14 years
U.S. Cl. D20—2



377,053
DISPLAY GARMENT FOR THE HAND
Douglas A. Williams, 926 Victoria Landing Dr., Woodstock, Ga. 30188
Filed Feb. 23, 1995, Ser. No. 35,252
Term of patent 14 years
U.S. Cl. D20—33

377,054
VERTICAL HOLDER FOR PAPER INSERTS
Robert A. Noreika, Rocky Hill, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
Filed Aug. 31, 1994, Ser. No. 27,878
Term of patent 14 years
U.S. Cl. D20—40

377,055
GAME BOARD
Danna D. Thompson, 375 Merton St. Apt. 108, Toronto, Ontario, Canada
Filed Sep. 29, 1995, Ser. No. 44,769
Term of patent 14 years
U.S. Cl. D21—31



377,056
JOYSTICK
Ricardo Salinas, Palo Alto, Calif., assignor to Logitech S.A., Romanel/Morges, Switzerland
Filed Sep. 27, 1995, Ser. No. 44,594
Term of patent 14 years
U.S. Cl. D21—48

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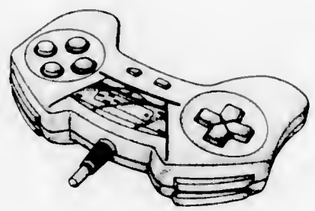
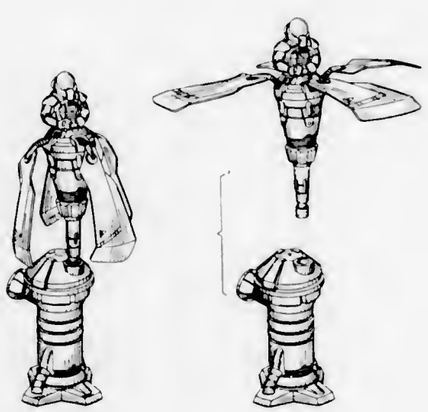
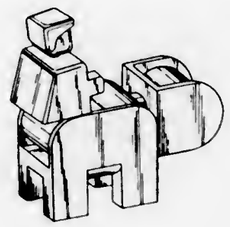
377,057
ELECTRONIC GAME HOUSING
Lan-Yan Lee, Fanling, N.T., Hong Kong, assignor to Esel International Company Limited, Hong Kong
Filed Feb. 15, 1996, Ser. No. 50,349
Term of patent 14 years
U.S. Cl. D21—48



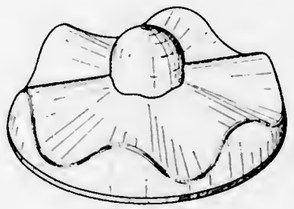
377,058
FLYING TOY
Michael E. Henley, Santa Barbara, Calif., assignor to Lanard Toys Limited, Hong Kong
Filed Oct. 13, 1995, Ser. No. 45,252
Term of patent 14 years
U.S. Cl. D21—83



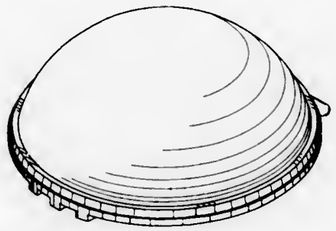
377,059
CONSTRUCTION GAME
Peter Larws, Schlappmuhlerpfad 13, 61250 Usingen, Germany
Filed Aug. 24, 1994, Ser. No. 27,575
Claims priority, application Benelux TM/Des. Off., Feb. 28, 1994, 69524/01-06
Term of patent 14 years
U.S. Cl. D21—108



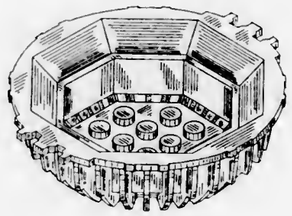
377,060
TUMBLER
Jesper B. Frederiksen, Nykøbing F., Denmark, assignor to INTERLEGO AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,186
Term of patent 14 years
U.S. Cl. D21—108



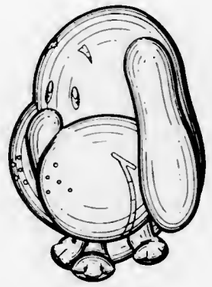
377,061
DOME FOR BALL AND ROD TOY CONSTRUCTION SET
Richard Gabriel, Portland, Oreg., assignor to Matrix Toys, Ltd., Portland, Oreg.
Filed Jan. 11, 1996, Ser. No. 48,710
Term of patent 14 years
U.S. Cl. D21—108



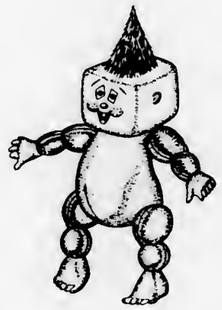
377,062
CAVITY FOR BALL AND ROD TOY CONSTRUCTION SET
Richard Gabriel, Portland, Oreg., assignor to Matrix Toys, Ltd., Portland, Oreg.
Filed Jan. 11, 1996, Ser. No. 48,711
Term of patent 14 years
U.S. Cl. D21—108



377,063
TOY
Constance R. Sisler, 50 Sutton Place South, New York, N.Y. 10022
Filed Nov. 28, 1995, Ser. No. 47,198
Term of patent 14 years
U.S. Cl. D21—161



377,064
DOLL
Carl Gurbisz, 3 Belaire Dr., Matawan, N.J. 07747
Filed Jun. 28, 1994, Ser. No. 25,266
Term of patent 14 years
U.S. Cl. D21—166



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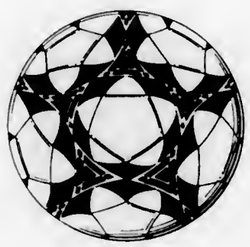
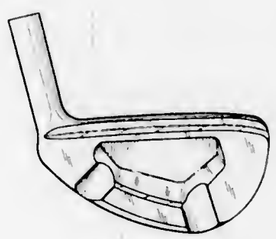
377,065
ATHLETIC BALL
Khurshid A. Soofi, Saga House, Daska Road, Toor Abad, Mubarikpura, Sialkot, Pakistan
Filed Jan. 17, 1995, Ser. No. 33,637
Term of patent 14 years
U.S. Cl. D21—204



377,066
COMBINED GOLF CLUB AND LEVEL
Charles L. Goosman, and Cheryl L. Goosman, both of Box 695, Gauley Bridge, W. Va. 25085
Filed Jul. 12, 1995, Ser. No. 41,362
Term of patent 14 years
U.S. Cl. D21—214

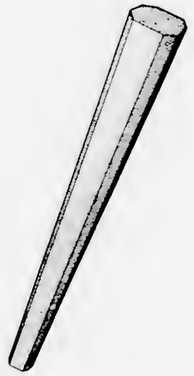
377,067
GOLF CLUB
Terry Wiens, 1814 - 196th Street, Langley, B.C., Canada, and Greg Howard, 3553 West 25th Street, Vancouver, B.C., Canada
Filed Jul. 7, 1995, Ser. No. 41,170
Term of patent 14 years
U.S. Cl. D21—219

377,068
GOLF CLUB HEAD
John T. Stites, III, Fortworth, Tex., assignor to Ray Cook Golf Company, Vista, Calif.
Filed Aug. 11, 1995, Ser. No. 42,561
Term of patent 14 years
U.S. Cl. D21—220



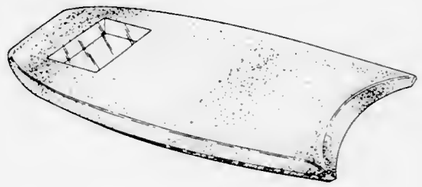
377,069
GOLF HEAD COVER
Randal W. High, 4456 W. 76th St., #103, Edina, Minn. 55435
Continuation of Ser. No. 669,214, Mar. 13, 1991, abandoned. This application Nov. 24, 1993, Ser. No. 15,713
Term of patent 14 years
U.S. Cl. D21—221

377,070
GOLF PUTTER GRIP
Paul Gurrola, 949 S. Hope St.-#3130, Los Angeles, Calif. 90015
Filed May 25, 1995, Ser. No. 40,197
Term of patent 14 years
U.S. Cl. D21—222



377,071
SKATE BOOT
Ting-Hsing Chen, Tainan, Taiwan, assignor to Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan
Filed Apr. 29, 1996, Ser. No. 53,721
Term of patent 14 years
U.S. Cl. D21—226

377,072
SURFBOARD WITH TRANSPARENT WINDOW
Patrick L. Hejay, North Hollywood, Calif., assignor to Leon Opseth, North Hollywood, Calif.
Filed Dec. 22, 1995, Ser. No. 48,233
Term of patent 14 years
U.S. Cl. D21—236



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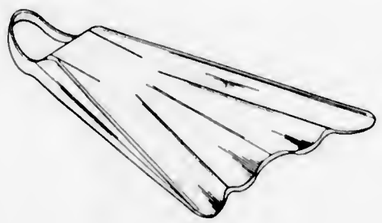
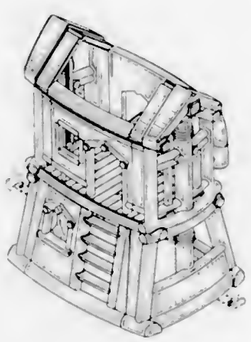
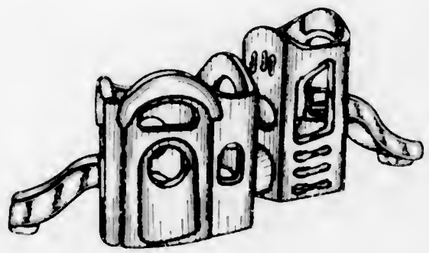
377,073
SWIMMING FIN
Barney Chang, No. 2, Lane 380, Chin-Hua N. Rd., Taichung, Taiwan
Filed Jan. 30, 1996, Ser. No. 49,735
Term of patent 14 years
U.S. Cl. D21—239



377,074
PLAYGROUND ACTIVITY APPARATUS
William K. Ford, Hudson, and Matthew R. Fuligni, Twinsburg, both of Ohio, assignors to The Little Tikes Company, Hudson, Ohio
Filed Jul. 7, 1995, Ser. No. 41,126
Term of patent 14 years
U.S. Cl. D21—243

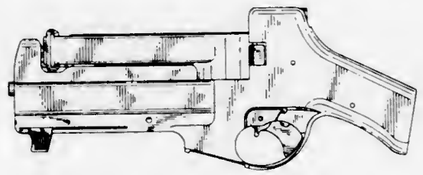


377,075
PLAYGROUND APPARATUS
Kenneth D. Temple, Twinsburg, and Christopher G. Walter, Suffield, both of Ohio, assignors to The Little Tikes Company, Hudson, Ohio
Filed Jul. 10, 1995, Ser. No. 41,216
Term of patent 14 years
U.S. Cl. D21—244



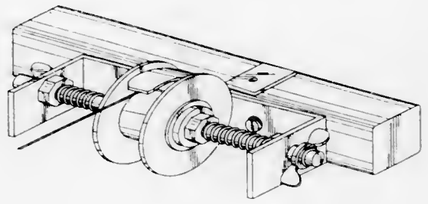
377,076
TENT STAKE
William E. Adams, Portersville, Pa., assignor to Adams Mfg. Corp., Portersville, Pa.
Filed Nov. 28, 1995, Ser. No. 47,196
Term of patent 14 years
U.S. Cl. D21—255

377,077
PISTOL
RenéPredazzer, Flemalle, Belgium, assignor to Fabrique Nationale Nouvelle Herstal, Herstal, Belgium
Filed Feb. 15, 1995, Ser. No. 34,907
Claims priority, application Belgium, Jan. 24, 1995, 5718
Term of patent 14 years
U.S. Cl. D22—104



377,078
ARROW REST SUPPORT GUIDE
B. Howard Coffey, LaGrange, Ky., assignor to Coffey Marketing Corporation, Crestwood, Ky.
Filed Jan. 30, 1996, Ser. No. 49,731
Term of patent 14 years
U.S. Cl. D22—107

377,079
ICE FISHING REEL
Paul Robinson, Box 81, Dwight, ON, Canada
Filed Sep. 29, 1995, Ser. No. 44,787
Term of patent 14 years
U.S. Cl. D22—137



377,080
FISH HOOK REMOVER
Ed E. Johnston, P.O. Box 648, Opalika, Ala. 36803-0648
Filed Dec. 18, 1995, Ser. No. 47,973
Term of patent 14 years
U.S. Cl. D22—149

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377,081

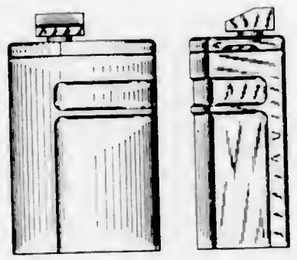
WATER TREATMENT CABINET

Alfred J. Lipshultz, 4090 Lake Dr., Coconut Creek, Fla. 33066, and Mitchell Lipshultz, Fort Lauderdale, Fla., assignors to Alfred J. Lipshultz, Coconut Creek, Fla.

Filed Oct. 10, 1995, Ser. No. 45,080

Term of patent 14 years

U.S. Cl. D23—207



377,082

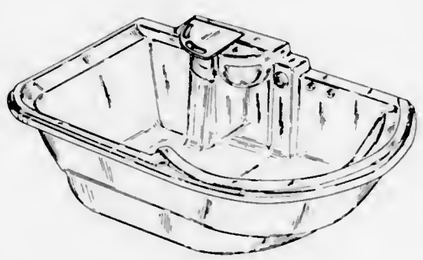
WHIRLPOOL TUB

Christopher A. Lacy, New Brighton, Minn., assignor to Pearl Baths, Inc., Minneapolis, Minn.

Filed Sep. 5, 1995, Ser. No. 43,506

Term of patent 14 years

U.S. Cl. D23—277



377,083

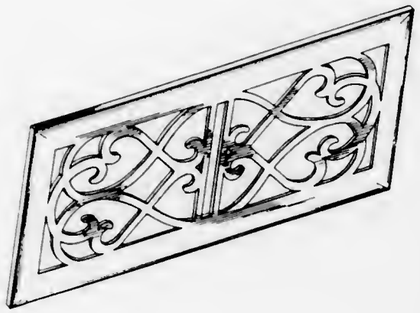
FLOOR REGISTER GRILLE

Morris Smolarski, Victoria, Australia, assignor to Ripponlea Austrlia Pty. Ltd., Victoria, Australia

Filed Mar. 24, 1995, Ser. No. 36,782

Term of patent 14 years

U.S. Cl. D23—393



377,084

COMBINED CEILING FAN MOUNTING CANOPY, MOTOR AND SWITCH HOUSING AND BLADE IRONS UNIT

Charles J. DiPasquale, Carrollton, Tex., assignor to Smartel, Inc., Carrollton, Tex.

Filed Jan. 27, 1995, Ser. No. 34,112

Term of patent 14 years

U.S. Cl. D23—411

377,085

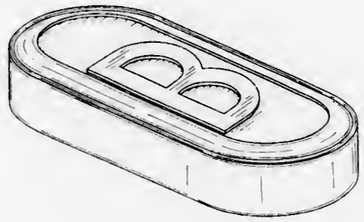
TABLET

George E. Tortarolo, Bridgewater, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 28, 1995, Ser. No. 41,966

Term of patent 14 years

U.S. Cl. D24—101



377,086

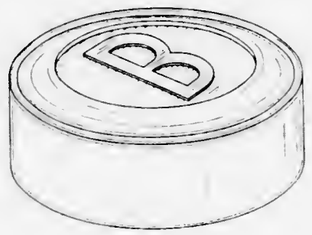
TABLET

George E. Tortarolo, Bridgewater, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 28, 1995, Ser. No. 41,968

Term of patent 14 years

U.S. Cl. D24—101



377,087

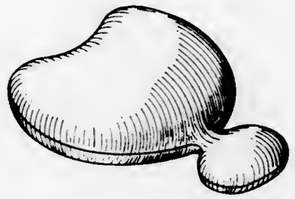
SOFTGEL CAPSULE

Gregory A. Schurig, Clearwater, and David G. Williams, Palm Harbor, both of Fla., assignors to R. P. Scherer Corporation, Troy, Mich.

Filed Dec. 4, 1995, Ser. No. 47,413

Term of patent 14 years

U.S. Cl. D24—104



377,088

Patent Not Issued For This Number

377,089

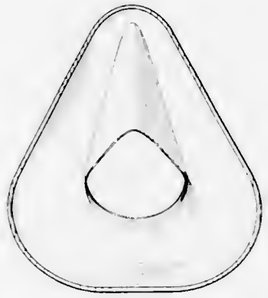
RESPIRATORY MASK FACIAL SEAL

Eric W. Starr, Gibsonia; John R. Starr, Leechburg, and Mary T. Walthour, Pitcairn, all of Pa., assignors to Respironics, Inc., Murrysville, Pa.

Filed Jun. 6, 1995, Ser. No. 39,856

Term of patent 14 years

U.S. Cl. D24—110.1



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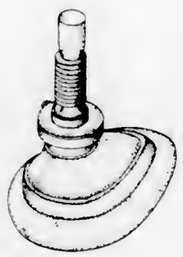
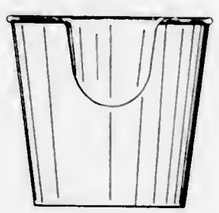
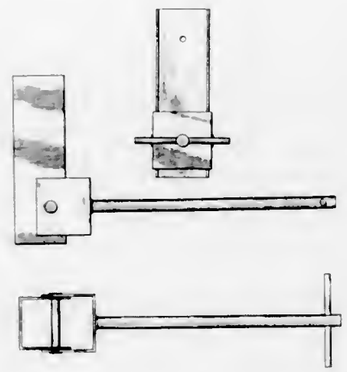
377,090
AID FOR ARTIFICIAL RESPIRATION
Gary C. J. Lee, No. 12, Alley 16, Chung-San St., Hsi-Chih, Taiwan
Filed Dec. 27, 1995, Ser. No. 48,353
Term of patent 14 years
U.S. Cl. D24—110.4



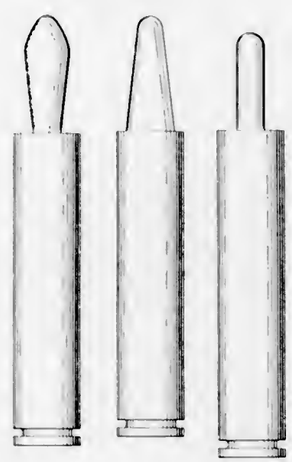
377,091
INSTRUMENT FOR ADMINISTERING MEDICATION TO THE NOSE
Jack J. Scott, Sr., P.O. Box 248, Bethany, Ill. 61914
Division of Ser. No. 167,241, Dec. 15, 1993, Pat. No. 5,417,652. This application May 12, 1995, Ser. No. 38,963
Term of patent 14 years
U.S. Cl. D24—121



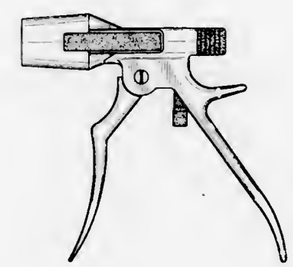
377,092
IV STAND HANDLE
Fred Ebert, 1250 Doblon St., Apt. C, Green Bay, Wis. 54302
Filed Jul. 3, 1995, Ser. No. 41,052
Term of patent 14 years
U.S. Cl. D24—128



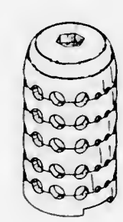
377,093
SPINAL DISTRACTOR
Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291
Filed May 27, 1994, Ser. No. 23,623
Term of patent 14 years
U.S. Cl. D24—135



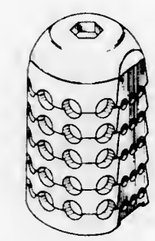
377,094
CLIP APPLICATOR HANDLE
David L. Foshee, Apex; Stephen J. Dawes, Raleigh; Bahram B. Rahimzadeh, Durham, and Jason R. Durkin, Raleigh, all of N.C., assignors to Pilling Weck Incorporated, Research Triangle Park, N.C.
Filed Jun. 2, 1995, Ser. No. 39,814
Term of patent 14 years
U.S. Cl. D24—143



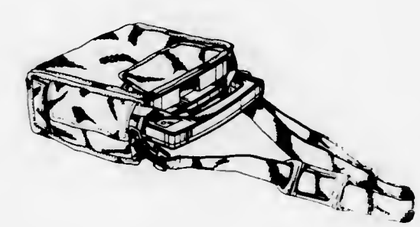
377,095
INTERBODY SPINAL IMPLANT
Gary K. Michelson, Venice, Calif., assignor to Sofamor Danek Properties, Inc., Memphis, Tenn.
Filed Jun. 3, 1994, Ser. No. 23,923
Term of patent 14 years
U.S. Cl. D24—155



377,096
INTERBODY SPINAL IMPLANT
Gary K. Michelson, Venice, Calif., assignor to Sofamor Danek Properties, Inc., Memphis, Tenn.
Filed Jun. 3, 1994, Ser. No. 23,926
Term of patent 14 years
U.S. Cl. D24—155



377,097
DEFIBRILLATOR IN SOFT-SIDED CARRYING BAG
Kenneth F. Olson, Minneapolis; Byron L. Gilman, Plymouth; Thomas M. Reiter, Woodbury, all of Minn., and James W. Luther, Boston, Mass., assignors to SurvivaLink Corporation, Minneapolis, Minn.
Filed Jun. 1, 1995, Ser. No. 39,811
Term of patent 14 years
U.S. Cl. D24—168



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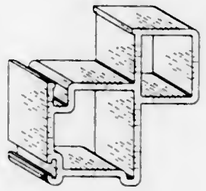
377,098
DEVICE FOR USE AS A LEARNING AID FOR CONVEYING A USER'S VOICE TO THE USER'S EAR
Kenichi Morimoto, Kitasouma-gun, Japan, assignor to Yugen-kaisha Keiei Vision Center, Japan
Filed Oct. 18, 1994, Ser. No. 29,853
Term of patent 14 years
U.S. Cl. D24—175

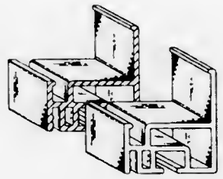
377,099
COLOR GUIDE FOR ARTIFICIAL TEETH
Devon O. Howe, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Nov. 14, 1995, Ser. No. 49,021
Term of patent 14 years
U.S. Cl. D24—181

377,100
MASSAGE DEVICE
Bernard L. Gladieux, Jr., 128 Oberholtzer Rd., Gilbertsville, Pa. 19525
Filed Oct. 18, 1995, Ser. No. 45,395
Term of patent 14 years
U.S. Cl. D24—211

377,101
WINDOW COMPONENT EXTRUSION
Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Kent, Wash.
Filed May 31, 1995, Ser. No. 39,613
The portion of the term of this patent subsequent to Aug. 6, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—124

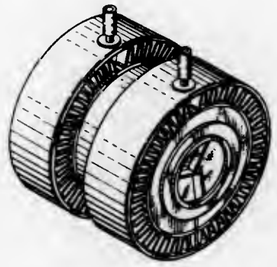


377,102
WINDOW COMPONENT EXTRUSION
Teresa A. Oliver, Kent, Wash., assignor to Mikron Industries, Inc., Kent, Wash.
Filed Dec. 1, 1995, Ser. No. 47,344
Term of patent 14 years
U.S. Cl. D25—124

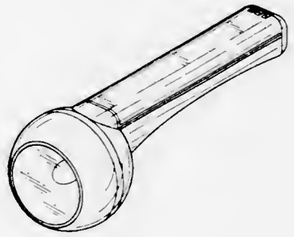


377,103
CANDLE TOPPER
Peggie (Margaret) C. Hibner, and Harry P. Hibner, Jr., both of 7015 Erdrick St., Philadelphia, Pa. 19135
Filed Feb. 22, 1996, Ser. No. 50,678
Term of patent 14 years
U.S. Cl. D26—23

377,104
LAMP WITH HEAT SINK
Roy D. Roberts, Newark, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.
Filed Apr. 13, 1995, Ser. No. 37,451
Term of patent 14 years
U.S. Cl. D26—24



377,105
RECHARGEABLE FLASHLIGHT
Se K. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Dec. 5, 1995, Ser. No. 47,490
Claims priority, application United Kingdom, Jul. 24, 1995, 2049028
Term of patent 14 years
U.S. Cl. D26—38



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LAMP
Alex Chan, Hong Kong, Hong Kong, assignor to Alpan, Inc., Camarillo, Calif.
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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31st DAY OF DECEMBER, 1996

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Amedure, Michael E.: *See*—
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Amemiya, Koji; and Inoue, Masahiro, to Canon Kabushiki Kaisha. Image forming apparatus. 5,589,922, Cl. 399-315.000.

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American Cyanamid Company: *See*—
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American Medical Systems, Inc.: *See*—
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American Microsystems, Inc.: *See*—
O'Shaughnessy, Timothy G.; and Brown, David G., 5,589,802, Cl. 331-44.000.

American Red Cross: *See*—
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American Rug Craftsmen, Inc. *See*—
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American Standard Inc.: *See*—
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American Wireless Corporation. *See*—
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An, Hyeong-keon; Shin, Young-ho; and Kim, Suk-ki, to Samsung Electronics Co., Ltd. Noise canceler. 5,590,206, Cl. 381-71.000.

Analog Devices, Inc.: *See*—
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Garavan, Patrick J., 5,589,785, Cl. 327-63.000.
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Anderson, Bradley T., to Wandel & Goltermann Technologies, Inc. Digital data sequence pattern filtering. 5,590,159, Cl. 375-340.000.

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Anderson, Iver E.; Lograsso, Barbara K.; and Terpstra, Robert L., to Iowa State University Research Foundation, Inc. Apparatus for making environmentally stable reactive alloy powders. 5,589,199, Cl. 425-10.000.

Anderson, Robert J., to CCL Label, Inc. Expanded content label adapted for application to curved surfaces. 5,588,239, Cl. 40-630.000.

Anderson, Stephen, to Rutgers, The State University of New Jersey. Methods for the prevention or treatment of vascular hemorrhaging and Alzheimer's disease. 5,589,154, Cl. 424-1.410.

Anderson, Thomas Q.; Broadrick, Garth W.; Christianson, Merrill A.; Hippe, Daniel A.; Hughes, Arthur T.; Kalyan, Jagdish C.; Nydegger, Daniel L.; Platt, Robert C.; and Ramachandran, Karapurath, to Boeing Company, The. Automated floor panel workcell. 5,590,046, Cl. 364-474.150.

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Asthana, Abhaya; Cravatts, Mark R.; and Krzyzanowski, Paul, to Lucent Technologies Inc. Intelligent memory system for processing variable length I/O instructions. 5,590,370, Cl. 395-800.000.

Astle, Brian, to Intel Corporation. Decoding variable-length encoded signals. 5,589,829, Cl. 341-67.000.

Astle, Brian, to Intel Corporation. Post-filtering for decoded video signals. 5,590,064, Cl. 364-715.020.

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Atlantic Research Corporation: *See*—
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Aubert, Lucien; and Gagnebien-Cabanne, Francoise, to L'Oreal. Cosmetic and/or dermatological composition for the treatment of aging, containing ceramides, and the use thereof. 5,589,178, Cl. 424-401.000.

Audemard, Gilles, to Hospal AG. Apparatus and method for controlling the rotation speed of electric motors. 5,590,237, Cl. 388-832.000.

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Auffret, René, to France Telecom Etablissement Autonome de Droit Public. Method and device for transmitting and switching packets in an optical network. 5,589,967, Cl. 359-123.000.

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Stiles, Ernest D.; and Hartsock, Dale L., 5,589,241, Cl. 428-36.900.

Foreman, Kevin G.; Miller, Paul J.; and Siska, Steven M., to TRW Inc. Battery monitor for unobstrusive installation with a battery connector. 5,590,058, Cl. 364-551.010.

Forestier, Guy, to Clecim. Process for melting scrap iron in an electric furnace and installation for implementing the process. 5,590,151, Cl. 373-72.000.

Fork, Werner, to J.M. Voith GmbH. Rotating machine part, in particular a rotor of a cycloid ship's propeller. 5,588,798, Cl. 415-111.000.

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Forster, Franz, to Linde Aktiengesellschaft. Planetary reducer and wheel bearing unit. 5,588,931, Cl. 475-338.000.

Fortier, Robert L. Adjustable bicycle rear axle support assembly. 5,588,662, Cl. 280-288.000.

Foscaro, Giancarlo; Tesser, Mirco; Battistella, Mirco; Bergamin, Mirco, and Canil, Gilberto, to Nordica S.p.A. Sports shoe with a reinforcing shell-frame. 5,588,228, Cl. 36-118.200.

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Foster, Raymond K.; and Foster, Randall M., to Raymond Keith Foster. Reciprocating floor conveyor for conveying palletized loads or the like. 5,588,522, Cl. 198-775.000.

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Ishida, Yoshio, to Diamond Electric Mfg. Co., Ltd. Heat radiating apparatus. 5,588,483, Cl. 165-86.000.

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Ishikawa, Hideaki, and Shinoda, Atsunao, to Matsushita Electric Industrial Co., Ltd. Drive through wireless order taking system. 5,590,407, Cl. 455-66.000.

Ishikawa, Hiromi, to Office Ishikawa Co., Ltd. Multifunctional bag. 5,588,749, Cl. 383-4.000.

Ishikawa, Kazuhiro: *See—*
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Ishikawa, Satoshi: *See—*
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Ishikawajima-Harima Heavy Industries Company Limited: *See—*
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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Ishiwata, Yutaka, and Itoh, Yoshiyasu, to Kabushiki Kaisha Toshiba. Corrosion-resistant material for contact with high temperature molten metal and method for production thereof. 5,590,392, Cl. 428-546.000.

Ishiyama, Noritaka; and Kobayashi, Koutarou, to Mitsubishi Steel Mfg. Co., Ltd. Magnetoresistance-effect magnetic sensor of the temperature compensating type. 5,589,768, Cl. 324-207.210.

Ishizaki, Toshio: *See—*
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Isobe, Yoshio; Ito, Toshio, and Shibata, Fumio, to Takeda Chemical Industries, Ltd. Feed composition for ruminant animals and method of feeding ruminant animals with the same. 5,589,186, Cl. 424-438.000.

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Ito, Katsuhiko; Kobayashi, Hideo; Ishiuchi, Yukio; and Shimada, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Structure for lubricating cam sliding surface in an internal combustion engine. 5,588,406, Cl. 123-90.340.

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Kou, James L. T., to Toshiba America Information Systems, Inc.: Apparatus and method for detecting and updating status of removable storage system using shared interrupt and software flag. 5,590,376, Cl. 395-839.000.

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Kraenzler, Erik J.: *See*—
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Krahn, Donald R., to Honeywell Inc.: Position detection apparatus including a circuit for receiving a plurality of output signal values and fitting the output signal values to a curve. 5,589,769, Cl. 324-207.260.

Krahn, Wollgang; Ernst, Johannes; and Drabent, Claudia, to Hoechst Aktiengesellschaft: Densely sintered, tabular ceramic parts of aluminum oxide having improved thermal shock resistance. 5,589,430, Cl. 501-120.000.

Krajewski, Marjan, Jr.; Chipchak, John C.; Chodorow, David A.; Trostle, Jonathan T.; and Baldwin, Peter T., to Mitre Corporation, The: Electronic information network user authentication and authorization system. 5,590,199, Cl. 380-25.000.

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Krause, Manfred; Kaufmann, Norbert, and Neumann, Mathias, to Boehringer Mannheim GmbH: Use of test strips to determine the UV intensity or to pre-determine the duration of stay in the sun without sunburn. 5,589,398, Cl. 436-164.000.

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Krein, William T.; Flaig, Charles M.; and Kelly, James D., to Apple Computer, Inc.: Bus protocol using separate clocks for arbitration and data transfer. 5,590,130, Cl. 370-462.000.

Kreitmeier, Franz, to ABB Management AG: Diffusor for a turbo-machine with outwardly curved guided plate. 5,588,799, Cl. 415-211.200.

Kreuter, Peter; and Heuser, Peter, to Meta Motoren- und Energie-Technik GmbH: Method for controlling an internal combustion engine with external ignition system and with a fuel injection system. 5,588,411, Cl. 123-418.000.

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Kridl, Jean C.; Bruening, George; and Knauf, Vic C., to Calgene, Inc.: Geminivirus-based gene expression system. 5,589,379, Cl. 435-240.400.

Kripakaran, Raghavan: *See*—
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Krounbi, Mohamad T.; Lee, Hin P. E.; and Seagle, David J., to International Business Machines Corporation: Lapping process for a single element magnetoresistive head. 5,588,199, Cl. 29-603.100.

Krstenansky, John L.; Nestor, John J., Jr.; Ho, Teresa H.; Vickery, Brian H.; and Bach, Chinh T., to Syntex (U.S.A.) Inc.: Analogs of parathyroid hormone and parathyroid hormone related peptide: synthesis and use for the treatment of osteoporosis. 5,589,452, Cl. 514-12.000.

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Kruse, John M.; Collins, John E.; and Sisley, Elizabeth M., to Minnesota Mining & Manufacturing Company: Resource assignment system providing mixed-initiative user interface updates. 5,590,269, Cl. 395-209.000.

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Su, Yuh-Jia, to Applied Materials, Inc. Gas distribution plate for semiconductor wafer processing apparatus with means for inhibiting arcing. 5,589,002, Cl. 118-723.00E.

Subisak, Gregory J.; and Hammond, Douglas S., to Holophone Corporation. Internally illuminated sign. 5,588,742, Cl. 362-291.000.

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Suda, Masashi: *See—*
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Sudo, Shuji: *See—*
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Suenaga, Yutaka, to Nikon Corporation. Retrofocus-type wide angle lens system having a fixed front lens group and a movable rear lens group. 5,589,988, Cl. 359-752.000.

Suga, Shuzo: *See—*
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Sugata, Yoshinobu; Yamazaki, Mikio; and Umegaki, Takashi, to Fuji Electric Co., Ltd. Ink jet recording head and method of producing the same. 5,589,860, Cl. 347-20.000.

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Sweitzer, Bruce K., Jr. Heat dissipation unit. 5,588,591, Cl. 237-8.00C.

Swisher, George W., Jr.; and Phillips, John F., to CMI Corporation. Paving machine having automatic metering screed control. 5,588,776, Cl. 404-72.000.

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Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, Re. 35,414, Cl. 348-416.000.
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Murakami, Tokumichi; Asai, Kohtaro; Kamizawa, Koh; Nishida, Masami; Yamazaki, Eizo; Itoh, Atsushi; and Kinjoh, Naoto, to Mitsubishi Denki Kabushiki Kaisha. Picture coding and decoding apparatus using vector quantization. Re. 35,414, Cl. 348-416.000.
Mylchreest, Iain C.; and Hail, Mark E., to Finnigan Corporation. Electrospray ion source with reduced neutral noise and method. Re. 35,413, Cl. 250-282.000.
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Seiko Epson Corporation: *See—*
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Suzuki, Katsumi; and Nishikawa, Mitsutaka, to Seiko Epson Corporation. Active matrix liquid crystal display device and method for production thereof. Re. 35,416, Cl. 349-41.000.
Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having an automatically operated built-in strobe. Re. 35,415, Cl. 396-165.000.
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LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bonnichsen, Frits F.; and Jørgensen, Peter N., to Novo Nordisk A/S. Syringe system. B1 5,462,535, Cl. 604-272.000.
Bucholz, Richard D., to Sofamor Danek Group, Inc. System for indicating the position of a surgical probe within a head on an image of the head. B1 5,383,454, Cl. 128-653.100.
Francart, Armand, Jr. Leak proof, preloaded, high-biasing force float-operated over-center valve actuating mechanism. B1 1,034,957, Cl. 417-133.000.
Jenkins, Thomas C.: *See—*
Palmquist, Donald L.; and Jenkins, Thomas C., B1 4,642,317, Cl. 514-558.000.
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Kelly, John G.: *See—*
Lorenc, Walter F.; Kelly, John G.; and Mandel, Frederick S., B1 4,457,847, Cl. 210-698.000.
Loeb, Marvin P.: *See—*
Saadatmanesh, Vahid; and Loeb, Marvin P., B1 5,387,211, Cl. 606-10.000.
Lorenc, Walter F.; Kelly, John G.; and Mandel, Frederick S., to Nalco Chemical Company. Carboxylate polymers for internal scale control agents in boiler systems. B1 4,457,847, Cl. 210-698.000.
Mandel, Frederick S.: *See—*
Lorenc, Walter F.; Kelly, John G.; and Mandel, Frederick S., B1 4,457,847, Cl. 210-698.000.
Marsala, Joseph: *See—*
Phillips, Benjamin A.; Zawacki, Thomas S.; and Marsala, Joseph, B1 5,367,884, Cl. 62-101.000.
Nalco Chemical Company: *See—*
Lorenc, Walter F.; Kelly, John G.; and Mandel, Frederick S., B1 4,457,847, Cl. 210-698.000.
Novo Nordisk A/S: *See—*
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Ohio Agricultural Research and Development Center: *See—*
Palmquist, Donald L.; and Jenkins, Thomas C., B1 4,642,317, Cl. 514-558.000.
Palmquist, Donald L.; and Jenkins, Thomas C., to Ohio Agricultural Research and Development Center. Process for feeding ruminant animals and composition for use therein. B1 4,642,317, Cl. 514-558.000.
Phillips, Benjamin A.; Zawacki, Thomas S.; and Marsala, Joseph, to Phillips Engineering Co. Generator-absorber-heat exchange heat transfer apparatus and method and use thereof in a heat pump. B1 5,367,884, Cl. 62-101.000.
Phillips Engineering Co.: *See—*
Phillips, Benjamin A.; Zawacki, Thomas S.; and Marsala, Joseph, B1 5,367,884, Cl. 62-101.000.

Rutherford, Jerry, to Rutherford, Lora E. Acoustical imaging system. B1 4,625,557, Cl. 73-635.000.
Rutherford, Lora E.: *See—*
Rutherford, Jerry, B1 4,625,557, Cl. 73-635.000.
Saadatmanesh, Vahid; and Loeb, Marvin P., to Trimedyne, Inc. Multi-head laser assembly. B1 5,387,211, Cl. 606-10.000.
Saarinen, Esko, to Valmet Paper Machinery Inc. Extended nip press with displaceable centre of gravity for the supporting force. B1 4,713,147, Cl. 162-358.300.
Silicon Systems, Inc.: *See—*
Yamasaki, Richard G., B1 4,803,445, Cl. 331-177.00R.
Sofamor Danek Group, Inc.: *See—*
Bucholz, Richard D., B1 5,383,454, Cl. 128-653.100.
Trimedyne, Inc.: *See—*
Saadatmanesh, Vahid; and Loeb, Marvin P., B1 5,387,211, Cl. 606-10.000.
Ultralite International Pty. Limited: *See—*
Wong, Siew E.; and Yang, Thien S., B1 5,426,344, Cl. 315-200.00R.
Valmet Paper Machinery Inc.: *See—*
Saarinen, Esko, B1 4,713,147, Cl. 162-358.300.
Wong, Siew E.; and Yang, Thien S., to Ultralite International Pty. Limited. Electronic ballasts. B1 5,426,344, Cl. 315-200.00R.
Yamasaki, Richard G., to Silicon Systems, Inc. Variable frequency oscillator. B1 4,803,445, Cl. 331-177.00R.
Yang, Thien S.: *See—*
Wong, Siew E.; and Yang, Thien S., B1 5,426,344, Cl. 315-200.00R.
Zawacki, Thomas S.: *See—*
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Adams Mfg. Corp.: *See—*
Adams, William E., 377,076, Cl. D21-255.000.
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adidas AG: *See—*
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Andrea, Douglas, to Andrea Electronics Corportion. Tethered media/communication handset. 377,024, Cl. D14-218.000.
Andrea Electronics Corportion: *See—*
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Andrea, Douglas, 377,024, Cl. D14-218.000.
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Avar, Eric P., to Nike, Inc. Element of a shoe midsole. 376,902, Cl. D2-977.000.
Azeez, Fayez. Mechanical pencil with attached molded pencil grip. 377,050, Cl. D19-49.000.
BabySmart: *See—*
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Barnhill, Russell E. Portable kitchen cabinet. 376,933, Cl. D6-445.000.
Barriault, Ronald F.; and Boucher, Ronald, to Central Distributors, Inc. Wine dispenser. 376,949, Cl. D7-306.000.
Bartlett, Glenda: *See—*
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Bartlett, Jerrold; and Bartlett, Glenda. Hand-held digging implement. 376,966, Cl. D8-11.000.
Batki-Braun, Gabriel; and Heppenstall, Bernard, to Faversham Furniture Limited. Oval table. 376,934, Cl. D6-480.000.
Batki-Braun, Gabriel; and Heppenstall, Bernard, to Faversham Furniture Limited. Table. 376,936, Cl. D6-488.000.
BBA Holdings, Inc.: *See—*
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DiRocco, Anthony. Combined key holder, picture display and container. 376,904, Cl. D3-208.000.
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451 5,588,357

CLASS 100
53 5,588,358

CLASS 101
128.21 5,588,359
212 5,588,360
216 5,588,361
218 5,588,362
230 5,588,363
247 5,588,364
350 5,588,365
484 5,588,366

CLASS 102
202.14 5,589,657
521 5,589,658

CLASS 105
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199.1 5,588,368

CLASS 106
14.12 5,588,989
716 5,588,990

CLASS 108
2 5,588,369
42 5,588,370
51.1 5,588,371
55.1 5,588,372
55.3 5,588,373
56.3 5,588,374
102 5,588,375
106 5,588,376
145 5,588,377

CLASS 110
101 A 5,588,378
262 5,588,379
263 5,588,380
345 5,588,381

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139 5,588,382

CLASS 112
80.16 5,588,383
475.06 5,588,384
475.09 5,588,385

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261 5,588,387
271 5,588,388
5,588,389
274 5,588,390
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5,588,992
13 5,588,993
89 5,588,994
201 5,588,995

CLASS 118
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410 5,588,998
413 5,589,659
668 5,588,996
715 5,588,999
5,589,000
722 5,589,001
723 E 5,589,002
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252 5,588,396
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468 5,588,397
822 5,588,398

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406.1 5,588,400

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65 PE 5,588,402
90.11 5,588,403
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90.33 5,588,405
90.34 5,588,406
192.2 5,588,407
196 W 5,588,408
339.11 5,588,409
416 5,588,410
418 5,588,411
496 5,588,412
508 5,588,413
571 5,588,414
676 5,588,415
684 5,588,416
697 5,588,417

CLASS 125
13.01 5,588,418
15 5,588,419

CLASS 126
25 R 5,588,420
200 5,588,421

CLASS 128
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203.26 5,588,423
207.15 5,588,424
632 5,588,425
633 5,588,427
653.1 5,588,428
5,588,430
B1 5,383,454
653.3 5,588,431
660.03 5,588,432
660.05 5,588,433
660.07 5,588,434
5,588,435
662.03 5,588,436
691 5,588,437
692 5,588,438
721 5,588,439
734 5,588,429
5,588,440
743 5,588,441
772 5,588,442
5,588,443
782 5,588,444
846 5,588,445

CLASS 131
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259 5,588,448

CLASS 132
76.4 5,588,453
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218 5,588,450
273 5,588,451
321 5,588,452

CLASS 134
10 5,589,004
30 5,589,005

CLASS 135
24 5,588,454
28 5,588,455
67 5,588,456
85 5,588,457

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249 5,589,007
259 5,589,008

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557 5,588,462
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613 5,588,464
625.64 5,588,465
831 5,588,466

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121 5,588,468
137 5,588,469

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5,588,472
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CLASS 144
24.12 5,588,474

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5,589,017
94 5,589,018
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185 5,589,020
219 5,589,021
231 5,589,022
245 5,589,023
5,589,024
268 5,589,025
286 5,589,026
304.4 5,589,027
306.6 5,589,028
344 5,589,029

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370.21 5,588,476

CLASS 162

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84 5,589,033
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CLASS 165

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86 5,588,483
122 5,588,484
157 5,588,485
300 5,588,480

CLASS 166

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51 5,588,487
293 5,588,488
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370 5,588,490
383 5,588,491

CLASS 169

11 5,588,492
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CLASS 171

124 5,588,494

CLASS 173

170 5,588,495
178 5,588,496

CLASS 174

51 5,589,663
52.1 5,589,664
67 5,589,665
87 5,589,666
135 5,589,667
266 5,589,668
5,589,669

CLASS 175

420.1 5,588,497

CLASS 177

25.13 5,589,670

CLASS 180

65.4 5,588,498

CLASS 182

135 5,588,499
141 5,588,500

CLASS 184

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6.4 5,588,503
6.8 5,588,504
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CLASS 187

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CLASS 188

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5,588,509
299 5,588,510
374 5,588,511

CLASS 190

115 5,588,512
5,588,513

CLASS 192

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48.91 5,588,516
70.25 5,588,517
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CLASS 198

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781.08 5,588,523

CLASS 200

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CLASS 203

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CLASS 204

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192.26 5,589,040
192.33 5,589,041
192.34 5,589,042
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286 5,589,044
406 5,589,045
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630 5,589,050

CLASS 205

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349 5,589,052
698 5,589,053
766 5,589,056
768 5,589,055

CLASS 206

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308.1 5,588,526
5,588,527
5,588,528
315.1 5,588,529
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454 5,588,531
522 5,588,532
5,588,533

CLASS 208

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CLASS 209

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244 5,588,642
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CLASS 210

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130 5,589,060
198.2 5,589,061
5,589,062
5,589,063
206 5,589,064
222 5,589,065
258 5,589,066
493.5 5,589,067
614 5,589,068
635 5,589,069
636 5,589,070
638 5,589,071
5,589,072
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704 5,589,073
727 5,589,075
739 5,589,076
741 5,589,077
748 5,589,078
784 5,589,079
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804 5,589,081

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70.8 5,588,542
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CLASS 215

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237 5,588,546
247 5,588,547
388 5,588,548

CLASS 216

2 5,589,082
24 5,589,083
5,589,084
65 5,589,085

CLASS 218

34 5,589,672
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71 5,589,674
140 5,589,675

CLASS 219

69.16 5,589,086
93 5,589,087
110 5,589,088
121.6 5,589,089
121.62 5,589,090
270 5,589,091
506 5,589,092
679 5,589,093
711 5,589,094

CLASS 220

7 5,588,549
525 5,588,550
574.1 5,588,551
712 5,588,552

CLASS 221

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88 5,588,554
197 5,588,555

CLASS 222

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54 5,588,557
64 5,588,558
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106 5,588,560
129 5,588,561
153.06 5,588,562
158 5,588,563
383.1 5,588,564
394 5,588,565
402.11 5,588,566
475.1 5,588,567

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CLASS 224

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155 5,588,570
222 5,588,571
321 5,588,572
329 5,588,573
520 5,588,574

CLASS 227

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119 5,588,576
120 5,588,577
155 5,588,578
175.1 5,588,579
176.1 5,588,580
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132 5,588,584
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198.2 5,588,586
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CLASS 232

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CLASS 235

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5,589,679
482 5,589,680
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CLASS 236

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CLASS 237

8 C 5,588,591

CLASS 239

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67 5,588,593
107 5,588,594
222.17 5,588,595
542 5,588,596
553.5 5,588,597

CLASS 241

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23 5,588,599
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CLASS 242

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35.50 A 5,588,602
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47.05 5,588,604
268 5,588,605
347 5,588,606
356.3 5,588,607
374 5,588,608
376 5,588,609
378.1 5,588,626
379 5,588,610
381.1 5,588,611
383.1 5,588,612
395 5,588,613
538.2 5,588,614
598.3 5,588,615
599 5,588,627
607.1 5,588,628

CLASS 244

1 N 5,588,617
1 R 5,588,616
17.19 5,588,618
53 R 5,588,619
90 A 5,588,620

CLASS 246

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CLASS 248

27.1 5,588,621
101 5,588,622
164 5,588,623
188.4 5,588,624
371 5,588,625
475.1 5,588,629
514 5,588,630
553 5,588,631
560 5,588,632
647 5,588,633

CLASS 250

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214 R 5,589,683
225 5,589,684
282 Re.35,413
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338.3 5,589,687
338.4 5,589,688
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390.06 5,589,690

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129.03 5,588,637
129.04 5,588,636
315.05 5,588,638

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62.59 5,589,097
67 5,589,098
182.11 5,589,691
299.01 5,589,100
5,589,101
5,589,102
299.61 5,589,103
315.1 5,589,104
351 5,589,105
387 5,589,106
392 5,589,107
500 5,589,108
518 5,589,109

CLASS 254

133 R 5,588,639

CLASS 257

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48 5,589,693
67 5,589,694
77 5,589,695
105 5,589,696
204 5,589,697
231 5,589,698
316 5,589,699
325 5,589,700
369 5,589,701
379 5,589,702
419 5,589,703
436 5,589,704
459 5,589,705
529 5,589,706
532 5,589,707
646 5,589,708
666 5,589,709
718 5,589,711
750 5,589,712
773 5,589,713
788 5,589,714

CLASS 261

61 5,589,110

CLASS 264

4.3 5,589,370
8 5,589,111
40.5 5,589,113
40.6 5,589,114
60 5,589,115
65 5,589,116
113 5,589,117
122 5,589,118
129 5,589,119
130 5,589,120
132 5,589,121
146 5,589,122
154 5,589,123
157 5,589,124
187 5,589,125
211 5,589,126
280 5,589,127
328.1 5,589,128
413 5,589,112
437 5,589,129
537 5,589,130
568 5,589,131

CLASS 267

64.11 5,588,640
119 5,588,641

CLASS 271

35 5,588,643
183 5,588,644

CLASS 273

142 B 5,588,650
284 5,588,654

CLASS 277

35 5,588,656
180 5,588,657

CLASS 280

11.22 5,588,658
47.19 5,588,659
95.1 5,588,660
202 5,588,661
288 5,588,662
304.1 5,588,663
689 5,588,664
704 5,588,665
728.2 5,588,666
5,588,667
5,588,668
728.3 5,588,669
730.2 5,588,670
5,588,671
5,588,672
731 5,588,673
732 5,588,674
738 5,588,675
741 5,588,676
806 5,588,677

CLASS 283

67 5,588,678
5,588,679

CLASS 285

3 5,588,680
46 5,588,681
52 5,588,682
62 5,588,683
5,588,684
94 5,588,685

CLASS 292

92 5,588,686
259 R 5,588,687

CLASS 294

106 5,588,688
118 5,588,689

CLASS 296

77.1 5,588,690
93 5,588,691
146.7 5,588,692
188 5,588,694

CLASS 297

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129 5,588,696
173 5,588,697
184.11 5,588,698
216.11 5,588,699
238 5,588,700
256.16 5,588,701
277 5,588,702
284.4 5,588,703
314 5,588,704
367 5,588,705
374 5,588,706
378.12 5,588,707
423.2 5,588,708
440.19 5,588,709
463.1 5,588,710

CLASS 298

18 5,588,711
22 C 5,588,712

CLASS 299

5 5,588,713

CLASS 300

21 5,588,714

CLASS 301

37.25 5,588,715

CLASS 303

7 5,588,716
84.2 5,588,717
113.1 5,588,718
122.04 5,588,719
122.08 5,588,720
163 5,588,721
186 5,588,722

CLASS 307

10.1 5,589,715
10.8 5,589,716
72 5,589,718
131 5,589,719

CLASS 310

61 5,589,720
90.5 5,589,721
180 5,589,722
328 5,589,723
348 5,589,724
358 5,589,725

CLASS 312

205 5,588,723
236 5,588,724
245 5,588,725
263 5,588,726
283 5,588,727
332.1 5,588,728
334.4 5,588,729
348.2 5,588,730
405 5,588,731

CLASS 313

161 5,589,726
231.31 5,589,727
336 5,589,728
440 5,589,729
493 5,589,730
495 5,589,731
506 5,589,732
509 5,589,733
636 5,589,734
638 5,589,735

CLASS 314

317 5,589,486

CLASS 315

5.43 5,589,736
111.21 5,589,737
169.1 5,589,738
176 5,589,739
200 R B1 5,426,344
291 5,589,740
307 5,589,742
360 5,589,741

CLASS 318

139 5,589,743
254 5,589,744
431 5,589,745
439 5,589,746
468 5,589,747
560 5,589,748
564 5,589,749
573 5,589,750
701 5,589,751
5,589,752
785 5,589,753
805 5,589,754

CLASS 320

21 5,589,755
22 5,589,756
5,589,757

CLASS 322

100 5,589,758

CLASS 323

222 5,589,759
247 5,589,760
285 5,589,761
351 5,589,762

CLASS 324

76.15 5,589,763
157 5,589,764
158.1 5,589,765
5,589,766
173 5,589,767
207.21 5,589,768
207.26 5,589,769
209 5,589,770
212 5,589,771
240 5,589,772
261 5,589,773
309 5,589,774
346 5,589,775
534 5,589,776
537 5,589,777
654 5,589,778
714 5,589,779
751 5,589,780
755 5,589,781

CLASS 326

38 5,589,782
71 5,589,783

CLASS 327

18 5,589,784
63 5,589,785
108 5,589,786
202 5,589,787
276 5,589,788
278 5,589,789
333 5,589,790
359 5,589,791
512 5,589,792
536 5,589,793
538 5,589,794
553 5,589,795

CLASS 330

133 5,589,796
149 5,589,797
263 5,589,798
277 5,589,799
288 5,589,800

CLASS 331

14 5,589,801
44 5,589,802
116 R 5,589,804
177 R B3 4,803,445

CLASS 332

109 5,589,805

CLASS 333

193 5,589,806
212 5,589,807

CLASS 336

92 5,589,808

CLASS 337

36 5,589,809

CLASS 338

4 5,589,810
210 5,589,811

CLASS 340

309.15 5,589,812
310.01 5,589,813
426 5,589,814
444 5,589,815
5,589,816
467 5,589,817
506 5,589,818
571 5,589,819
572 5,589,820
573 5,589,821
583 5,589,822
622 5,589,823
628 5,589,824
854.9 5,589,825
901 5,589,827

CLASS 341

20 5,589,828
67 5,589,829
110 5,589,830
159 5,589,831
161 5,589,832

CLASS 342

195 5,589,833
354 5,589,834
357 5,589,835
5,589,836
359 5,589,837
387 5,589,838

CLASS 343

713 5,589,839
718 5,589,840
760 5,589,841
787 5,589,842
820 5,589,843
860 5,589,844
909 5,589,845

CLASS 345

8 5,589,846
98 5,589,847
102 5,589,848
126 5,589,849
132 5,589,850
136 5,589,851
147 5,589,852
150 5,589,853
161 5,589,854
173 5,589,855
5,589,856
174 5,589,857

CLASS 347

14 5,589,858
19 5,589,859
20 5,589,860
22 5,589,861
28 5,589,865
46 5,589,864
75 5,589,863
87 5,589,862
102 5,589,866
141 5,589,867
171 5,589,868
212 5,589,869
233 5,589,870
237 5,589,871

CLASS 348

12 5,589,872
15 5,589,873
72 5,589,874
143 5,589,875
164 5,589,876
186 5,589,877
211 5,589,878
223 5,589,879
229 5,589,880
300 5,589,881
340 5,589,882
379 5,589,883
405 5,589,884
416 Re.35,414
5,589,885
461 5,589,886
616 5,589,887
669 5,589,888
674 5,589,889
678 5,589,890
730 5,589,891
731 5,589,892
734 5,589,893

CLASS 349

16 5,589,958
41 Re.35,416
5,589,961
46 5,589,962
76 5,589,960
88 5,589,959
119 5,589,963
160 5,589,964
165 5,589,965
194 5,589,966

CLASS 351

153 5,589,895
219 5,589,896
223 5,589,897
237 5,589,898
245 5,589,899

CLASS 356

3.12 5,589,927
4.1 5,589,928
5.01 5,589,929
5,589,930
33 5,589,931
39 5,589,932
73.1 5,589,933
218 5,589,934
328 5,589,717
339 5,589,935
345 5,589,936
352 5,589,937
359 5,589,938
375 5,589,939
376 5,589,940
5,589,941
5,589,942

CLASS 358

449 5,589,948
451 5,589,949
455 5,589,950
473 5,589,951
487 5,589,952
498 5,589,953
518 5,589,954

CLASS 359

9 5,589,955
15 5,589,956
23 5,589,957
123 5,589,967
124 5,589,968
5,589,969
5,589,970
133 5,589,972
196 5,589,973
214 5,589,974
290 5,589,975
345 5,589,976
362 5,589,977
375 5,589,978
412 5,589,979
449 5,589,980
478 5,589,981
529 5,589,982
565 5,589,983
566 5,589,984
603 5,589,985
608 5,589,986
684 5,589,987
701 5,589,988
752 5,589,989
785 5,589,990
799 5,589,991
856

CLASS 360

15 5,589,994
48 5,589,995
73.03 5,589,996
77.14 5,589,997
78.14 5,589,998
85 5,589,999
96.5 5,590,000
97.02 5,590,001
5,590,002
98.07 5,590,003
99.12 5,590,004
103 5,590,005
105 5,590,006
109 5,590,007
126 5,590,008
135 5,590,009

CLASS 361

93 5,590,010
106 5,590,011
113 5,590,012
187 5,590,013
225 5,590,014
277 5,590,015
313 5,590,016
321.4 5,590,017
612 5,590,018
643 5,590,019
680 5,590,020
681 5,590,021
683 5,590,022
5,590,023
684 5,590,024
695 5,590,025
704 5,590,026
732 5,590,027
737 5,590,028
760 5,590,029
794 5,590,030

CLASS 362

10 5,588,732
37 5,588,733
61 5,588,734
102 5,588,735
106 5,588,736
148 5,588,737
184 5,588,738
205 5,588,739
221 5,588,740
267 5,588,741
291 5,588,742
299 5,588,743
405 5,588,744

CLASS 363

8 5,590,031
15 5,590,032
25 5,590,033

CLASS 364

167.01 5,590,034
177 5,590,035
184 5,590,036
424.04 5,590,040
424.051 5,590,041
426.01 5,590,042
449.1 5,590,043
453 5,590,044
470.1 5,590,045
474.13 5,590,046
478.02 5,590,047
489 5,590,048
5,590,049
490 5,590,050
496 5,590,051
498 5,590,052
499 5,590,053
505 5,590,054
550 5,590,055
5,590,056
551.01 5,590,057
5,590,058
559 5,590,059
560 5,590,060
571.03 5,590,061
578 5,590,062
580 5,590,063
715.02 5,590,064
724.1 5,590,065
725 5,590,066
5,590,067

CLASS 365

45 5,590,104
63 5,590,068
96 5,590,069
149 5,590,070
5,590,071
185.01 5,590,072
185.08 5,590,073
185.22 5,590,074
5,590,075
185.25 5,590,076
189.01 5,590,078
189.05 5,590,077
201 5,590,079
5,590,080
203 5,590,081
222 5,590,082
230.01 5,590,083
5,590,084
230.03 5,590,085
5,590,086
230.05 5,590,087
233 5,590,088
233.5 5,590,089

CLASS 366

130 5,588,745

CLASS 367

7 5,590,090
140 5,590,091

CLASS 368

10 5,590,092
15 5,590,093

CLASS 369

4 5,590,094
13 5,590,095
5,590,096
5,590,097
5,590,098
5,590,099
5,590,100
5,590,101
5,590,102
5,590,103
5,590,104
5,590,106
54 5,590,107
59 5,590,108
77.2 5,590,109
100 5,590,110
116 5,590,111
124 5,590,112
270 5,590,113
290 5,590,114
5,590,115

CLASS 370

218 5,590,118
225 5,590,119
236 5,590,132
248 5,590,117
253 5,590,116
254 5,590,120
258 5,590,124
260 5,590,127
5,590,128
290 5,590,121
329 5,590,126
349 5,590,133
376 5,590,129
394 5,590,122
397 5,590,123
5,590,125
461 5,590,131
462 5,590,130

CLASS 371

21.5 5,590,134
22.1 5,590,135
25.1 5,590,136
27 5,590,137
37.1 5,590,138
49.1 5,590,139
61 5,590,140

CLASS 372

10 5,590,141
18 5,590,142
28 5,590,143
36 5,590,144
50 5,590,145
58 5,590,146
75 5,590,147
105 5,590,148
107 5,590,149

CLASS 373

9 5,590,150
72 5,590,151
103 5,590,152

CLASS 374

10 5,588,746
157 5,588,747
158 5,588,748

CLASS 375

222 5,590,153
229 5,590,154
261 5,590,155
316 5,590,156
327 5,590,157
331 5,590,158
340 5,590,159
367 5,590,160
368 5,590,161

CLASS 376

320 5,590,162

CLASS 377

110 5,590,163

CLASS 378

4 5,590,164
18 5,590,165
37 5,590,166
38 5,590,167
43 5,590,168
63 5,590,170
87 5,590,169

CLASS 379

33 5,590,171
58 5,590,172
5,590,173
5,590,174
5,590,175
59 5,590,176
60 5,590,177
96 5,590,178
107 5,590,179
112 5,590,180
114 5,590,181
130 5,590,182
142 5,590,183
5,590,184
163 5,590,185
210 5,590,186
212 5,590,187
225 5,590,188
356 5,590,189
5,590,190
451 5,590,191

CLASS 380

4 5,590,192
5,590,193
5 5,590,194
9 5,590,195
18 5,590,196
21 5,590,198
24 5,590,197
25 5,590,199
46 5,590,200
49 5,590,201
5,590,202

CLASS 381

4 5,590,203
24 5,590,204
71 5,590,205
5,590,206
90 5,590,207
154 5,590,208
168 5,590,209
182 5,590,214
183 5,590,213
191 5,590,212
193 5,590,211
199 5,590,210

CLASS 382

104 5,590,217
128 5,590,215
157 5,590,218
202 5,590,219
203 5,590,220
232 5,590,221
268 5,590,222
270 5,590,223
291 5,590,224

CLASS 383

4 5,588,749

CLASS 384

15 5,588,750
463 5,588,751
477 5,588,752
488 5,588,753
527 5,590,225
609 5,588,754

CLASS 385

45 5,590,226
53 5,590,227
56 5,590,228
59 5,590,229
77 5,590,230
78 5,590,231
92 5,590,232
100.6 5,590,233
135 5,590,234

CLASS 386

47 5,589,946
72 5,589,992
81 5,589,993
83 5,589,945
84 5,589,944
96 5,589,947
121 5,589,943

CLASS 388

803 5,590,235
821 5,590,236
832 5,590,237

CLASS 392

412 5,590,238
418 5,590,239
483 5,590,240

CLASS 393

704 5,590,335

CLASS 395

2.36 5,590,241
2.54 5,590,242
23 5,590,243
95 5,590,244
109 5,590,246
110 5,590,247
118 5,590,245
121 5,590,248
122 5,590,249
127 5,590,250
131 5,590,251
133 5,590,252
5,590,253

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135 5,590,254
141 5,590,255
167 5,590,260
173 5,590,261
181 5,590,272
182.01 5,590,273
182.04 5,590,276
182.05 5,590,274
183.06 5,590,275
183.14 5,590,277
185.06 5,590,278
5,590,279
185.08 5,590,280
200.01 5,590,281
200.02 5,590,282
5,590,283
200.03 5,590,288
200.05 5,590,284
200.20 5,590,285
204 5,590,037
209 5,590,269
241 5,590,038
250 5,590,286
5,590,287
5,590,289
298 5,590,290
326 5,590,268
5,590,271
340 5,590,264
5,590,265
5,590,266
5,590,267
5,590,295
393 5,590,365
394 5,590,297
401 5,590,298
403 5,590,299
405 5,590,300
412 5,590,301
5,590,302
416 5,590,303
427 5,590,304
5,590,305
430 5,590,306
442 5,590,307
458 5,590,308
463 5,590,309
472 5,590,310
473 5,590,326
477 5,590,311
500 5,590,312
5,590,313
5,590,315
5,590,316
556 5,590,348
564 5,590,291
566 5,590,296
570 5,590,293
581 5,590,294
591 5,590,317
602 5,590,319
604 5,590,322
5,590,324
605 5,590,321
610 5,590,325
615 5,590,318
618 5,590,320
619 5,590,327
670 5,590,328
675 5,590,323
676 5,590,314
681 5,590,334
683 5,590,270
701 5,590,330
704 5,590,332
705 5,590,329
708 5,590,331
5,590,336
727 5,590,337
735 5,590,338
742 5,590,339
750 5,590,340
5,590,341
5,590,342
5,590,343
759 5,590,039
764 5,590,259
787 5,590,256
792 5,590,257
793 5,590,258
800 5,590,345
5,590,346
5,590,347
5,590,349
5,590,350
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5,590,292
5,590,373
5,590,374
5,590,376
5,590,375
5,590,377
5,590,378
5,590,379
5,590,380
5,590,381
5,590,382

CLASS 396

3 5,589,902
12 5,589,901
51 5,589,908
55 5,589,904
5,589,912
80 5,589,911
96 5,589,909
106 5,589,910
165 Re.35,415
287 5,589,907
428 5,589,903
431 5,589,905
505 5,589,906
548 5,589,900

CLASS 399

28 5,589,923
60 5,589,914
114 5,589,918
120 5,589,915
145 5,589,920
262 5,589,919
274 5,589,917
286 5,589,916
297 5,589,921
302 5,589,926
315 5,589,922
323 5,589,925
350 5,589,924

CLASS 400

234 5,588,755
5,588,756
279 5,588,757
322 5,588,758
472 5,588,759
495 5,588,760
579 5,588,761
582 5,588,762
700 5,588,763

CLASS 401

99 5,588,764
216 5,588,765

CLASS 403

105 5,588,766
128 5,588,767
294 5,588,768
322 5,588,769
325 5,588,770
353 5,588,771
355 5,588,772
373 5,588,773

CLASS 404

6 5,588,774
45 5,588,775
72 5,588,776

CLASS 405

40 5,588,777
48 5,588,778
54 5,588,779
170 5,588,780
195.1 5,588,781
218 5,588,782
258 5,588,783
262 5,588,784
270 5,588,785
285 5,588,786

CLASS 406

85 5,588,787

CLASS 411

482 5,588,788

CLASS 414

217 5,588,789
331 5,588,790
5,588,791
404 5,588,792
557 5,588,793
729 5,588,794
733 5,588,795
741 5,588,796
797.5 5,588,797

CLASS 415

111 5,588,798
211.2 5,588,799

CLASS 416

24 5,588,800
46 5,588,801
186 R 5,588,803
223 R 5,588,804

CLASS 417

53 5,588,805
63 5,589,633
68 5,588,806
133 B1 Re.34,957
222.2 5,588,807
225 5,588,808
283 5,588,809
312 5,588,810
350 5,588,811
356 5,588,812
391 5,588,813
423.7 5,588,814
477.2 5,588,815
479 5,588,816
549 5,588,817

CLASS 418

5 5,588,818
39 5,588,819
55.4 5,588,820
259 5,588,821

CLASS 419

2 5,590,383
6 5,590,384
10 5,590,385
20 5,590,386
36 5,590,387
39 5,590,388
67 5,590,389

CLASS 422

24 5,589,132
79 5,589,133
99 5,589,135
102 5,589,136
104 5,589,137
108 5,589,138
144 5,589,139
159 5,589,140
164 5,589,141
171 5,589,142
5,589,143
179 5,589,144
186.3 5,590,390
292 5,589,145

CLASS 423

237 5,589,146
239.2 5,589,147
240 S 5,589,148
242.4 5,589,149
253 5,590,391
338 5,589,150
351 5,589,151
447.3 5,589,152
705 5,589,153

CLASS 424

1.41 5,589,154
9.2 5,589,155
45 5,589,156
47 5,589,157
49 5,589,158
5,589,159
5,589,160
59 5,589,161
70.12 5,589,162
70.51 5,589,163
76.5 5,589,164
78.03 5,589,165
78.35 5,589,166
85.7 5,589,167
93.4 5,589,168
94.2 5,589,169
94.6 5,589,170
94.67 5,589,171
145.1 5,589,173
147.1 5,589,174
208.1 5,589,175
400 5,589,176
401 5,589,177
5,589,178
5,589,179
402 5,589,180
405 5,589,181
423 5,589,182
5,589,183
5,589,184
5,589,185
438 5,589,186
439 5,589,187
450 5,589,189
462 5,589,190
480 5,589,191
486 5,589,192
497 5,589,194
499 5,589,195
617 5,589,196
663 5,589,197
667 5,589,198

CLASS 425

10 5,589,199
46 5,589,200
66 5,589,201
73 5,589,202
147 5,589,203
182 5,589,204
526 5,589,205
549 5,589,206

CLASS 426

20 5,589,207
89 5,589,208
231 5,589,209
243 5,589,210
298 5,589,211
438 5,589,213
506 5,589,214
549 5,589,215
607 5,589,216
611 5,589,217
614 5,589,218

CLASS 427

117 5,589,219
126.1 5,589,220
130 5,589,221
212 5,589,225
215 5,589,222
248.1 5,589,223
5,589,224
250 5,589,425
286 5,589,226
348 5,589,227
407.1 5,589,228
421 5,589,229
493 5,589,230
561 5,589,231
577 5,589,232
579 5,589,233
597 5,589,234

CLASS 428

1 5,589,235
5,589,236
5,589,237
10 5,589,238
34 5,589,239
34.1 5,589,240
36.9 5,589,241
45 5,589,242
56 5,589,243
64.3 5,589,244
85 5,589,245
120 5,589,246
141 5,589,247
174 5,589,248
200 5,589,249
209 5,589,250
5,589,251
215 5,589,274
216 5,589,252
220 5,589,253
221 5,589,254
261 5,589,255
283 5,589,256
284 5,589,257
286 5,589,258
323 5,589,259
327 5,589,260
332 5,589,261
336 5,589,262
5,589,263
359 5,589,264
361 5,589,265
407 5,589,267
408 5,589,268
411.1 5,589,269
5,589,270
421 5,589,271
425.6 5,589,272
433 5,589,273
458 5,589,275
488.1 5,589,276
500 5,589,277
546 5,590,392
552 5,590,393
611 5,589,278
623 5,589,279
626 5,589,280
688 5,589,281
694 ML 5,589,282
694 R 5,589,283
697 5,589,284

CLASS 429

13 5,589,285
34 5,589,286
41 5,589,287
96 5,589,288
99 5,589,290
103 5,589,291
122 5,589,289
170 5,589,292
172 5,589,293
178 5,589,294
190 5,589,295
191 5,589,296
212 5,589,297
218 5,589,298
5,589,299
5,589,300
234 5,589,301
250 5,589,302

CLASS 430

5 5,589,303
5,589,304
5,589,305
18 5,589,306
49 5,589,307
5,589,308
59 5,589,309
106 5,589,310
114 5,589,311
115 5,589,312
122 5,589,313
126 5,589,314
163 5,589,315
200 5,589,316
203 5,589,317
264 5,589,318
288.1 5,589,319
321 5,589,320
432 5,589,321
449 5,589,322
492 5,589,323
529 5,589,324
576 5,589,325

CLASS 431

1 5,588,822
241 5,588,823
285 5,588,824
349 5,588,825
354 5,588,826

CLASS 432

5 5,588,827
59 5,588,828
77 5,588,829
147 5,588,830
159 5,588,831

CLASS 433

4 5,588,832
24 5,588,833
26 5,588,834
81 5,588,835
93 5,588,836
172 5,588,837
173 5,588,838

CLASS 434

114 5,588,839
255 5,588,841
307 A 5,588,842

CLASS 435

4 5,589,326
5,589,327
5,589,328
5 5,589,329
5,589,330
6 5,589,331
5,589,332
5,589,333
5,589,334
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5,589,337
5,589,338
5,589,339
5,589,340
5,589,341
5,589,342
5,589,343
7.22 5,589,345
7.23 5,589,344
7.92 5,589,346
11 5,589,347
18 Re.35,417
26 5,589,348
5,589,349
29 5,589,350
5,589,351
34 5,589,352
5,589,353
47 5,589,354
66 5,589,355
68.1 5,589,356
5,589,357
69.1 5,589,358
5,589,360
5,589,361
5,589,362
69.2 5,589,359
69.6 5,589,363
69.7 5,589,364
85 5,589,365
119 5,589,366
172.3 5,589,367
5,589,368
5,589,369
189 5,589,371
193 5,589,372
220 5,589,373
240.1 5,589,374
240.2 5,589,375
5,589,376
5,589,377
240.4 5,589,379
252.3 5,589,380
252.31 5,589,383
252.33 5,589,384
252.5 5,589,381
5,589,382
258.35 5,589,385
262.5 5,589,386
264 5,589,387
290.3 5,589,388
5,589,391
306.1 5,589,389
307.1 5,589,390
320.1 5,589,392

CLASS 436

15 5,589,393
63 5,589,394
71 5,589,395
73 5,589,396
89 5,589,397
164 5,589,398
169 5,589,399
177 5,589,400
525 5,589,401

CLASS 437

2 5,589,402
5,589,403
5 5,589,404
6 5,589,405
21 5,589,406
26 5,589,407
29 5,589,408
31 5,589,409
40 5,589,410
41 5,589,411
43 5,589,412
5,589,413
44 5,589,414
57 5,589,415
60 5,589,416
190 5,589,417
193 5,589,418
220 5,589,420
225 5,589,421
228 5,589,422
5,589,423
229 5,589,424
795 5,589,419

CLASS 439

22 5,588,843
65 5,588,844
66 5,588,845
5,588,846
71 5,588,847
83 5,588,848
5,588,849
92 5,588,850
108 5,588,851
135 5,588,852
136 5,588,853
164 5,588,854

188 5,588,855
204 5,588,856
248 5,588,857
275 5,588,858
290 5,588,859
336 5,588,860
342 5,588,861
347 5,588,862
356 5,588,863
357 5,588,864
364 5,588,865
372 5,588,866
381 5,588,867
397 5,588,868
417 5,588,869
467 5,588,870
469 5,588,871
489 5,588,872
5,588,873
517 5,588,874
595 5,588,875
622 5,588,876
660 5,588,877
682 5,588,878
686 5,588,879
709 5,588,880
5,588,881
741 5,588,882
761 5,588,883
845 5,588,884
876 5,588,885

CLASS 440

67 5,588,886
88 5,588,887
89 5,588,888

CLASS 441

1 5,588,889
64 5,588,890
115 5,588,891
116 5,588,892

CLASS 445

6 5,588,893
24 5,588,894

CLASS 446

98 5,588,895
187 5,588,896
217 5,588,897
321 5,588,898

CLASS 451

5 5,588,899
92 5,588,900
99 5,588,901
288 5,588,902
344 5,588,903
512 5,588,904

CLASS 452

176 5,588,905
179 5,588,906
187 5,588,907

CLASS 454

78 5,588,908
141 5,588,909
154 5,588,910
290 5,588,911

CLASS 455

6.1 5,590,394
13.1 5,590,395
33.1 5,590,396
5,590,397
5,590,398
33.3 5,590,399
34.2 5,590,400
38.3 5,590,401
44 5,590,402
51.2 5,590,403
53.1 5,590,404
54.1 5,590,405
54.2 5,590,406
66 5,590,407
69 5,590,408
5,590,409
76 5,590,410
78 5,590,411
82 5,590,412
86 5,590,413
89 5,590,414
5,590,417
90 5,590,416
115 5,590,415
126 5,590,418
127 5,590,419

CLASS 460

101 5,588,912

CLASS 463

18 5,588,649
19 5,588,913
32 5,588,914

CLASS 464

14 5,588,915
20 5,588,916
79 5,588,917

CLASS 473

168 5,588,652
187 5,588,918
206 5,588,651
212 5,588,919
218 5,588,653
231 5,588,920
299 5,588,921
324 5,588,922
340 5,588,923
377 5,588,924
426 5,588,646
429 5,588,655
451 5,588,648
456 5,588,645
470 5,588,647

CLASS 474

81 5,588,925
212 5,588,926

CLASS 475

126 5,588,928
128 5,588,927
276 5,588,929
300 5,588,930
338 5,588,931
341 5,588,932

CLASS 476

51 5,588,933

CLASS 477

96 5,588,934
107 5,588,935
155 5,588,936
169 5,588,937

CLASS 482

4 5,588,938
57 5,588,939
105 5,588,940
131 5,588,941
139 5,588,942

CLASS 493

58 5,588,943
205 5,588,944
480 5,588,945

CLASS 494

11 5,588,946

CLASS 501

32 5,589,426
33 5,589,427
88 5,589,428
96 5,589,429
120 5,589,430

CLASS 502

175 5,589,431
325 5,589,432

CLASS 503

227 5,589,433
5,589,434
5,589,435

CLASS 504

114 5,589,436
225 5,589,437
236 5,589,438
261 5,589,439

CLASS 505

125 5,589,441
210 5,589,440

CLASS 507

103 5,589,442

CLASS 508

150 5,589,443
168 5,589,095
5,589,444
381 5,589,445

CLASS 510

175 5,589,446
237 5,589,447
284 5,589,448
466 5,589,449
514 5,589,099
535 5,589,450

CLASS 512

2 5,589,451

CLASS 514

2 5,589,516
8 5,589,453
11 5,589,455
12 5,589,452
5,589,456
5,589,457
13 5,589,458
15 5,589,459
17 5,589,460
18 5,589,461
21 5,589,462
5,589,463
23 5,589,464
25 5,589,465
37.3 5,589,494
44 5,589,466
46 5,589,467
52 5,589,468
91 5,589,469
154 5,589,470
167 5,589,471
183 5,589,472
5,589,473
211 5,589,474
215 5,589,475
230.2 5,589,476
256 5,589,477
269 5,589,478
275 5,589,479
282 5,589,480
287 5,589,481
305 5,589,482
310 5,589,483
314 5,589,484
315 5,589,485
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	5,588,622	5,588,265	5,588,905	5,589,386	5,589,782	5,590,220
	5,588,715	5,588,278	5,588,913	5,589,387	5,589,790	5,590,223
	5,588,779	5,588,298	5,588,914	5,589,392	5,589,798	5,590,224
	5,588,942	5,588,342	5,588,922	5,589,394	5,589,812	5,590,228
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	5,589,758	5,588,394	5,588,949	5,589,412	5,589,835	5,590,256
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06 :	Re.35,413	5,588,791	5,589,280	5,589,709	5,590,124	5,590,375
	5,588,153	5,588,792	5,589,328	5,589,718	5,590,130	5,590,376
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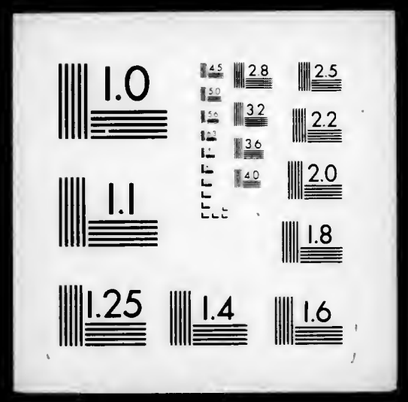

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